

The Impact of Structured Exercise on the Fear of Childbirth Among Pregnant Women

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INTRODUCTION

Pregnancy is a physiological event, but it also represents a period of significant transition that can be emotionally challenging for women (Widiastuti & Marfuah, 2019). During this time, women often experience a range of complex emotions, one of which is the fear of childbirth. Fear of childbirth is defined as a negative cognitive evaluation and an anxious attitude toward the process of labor and delivery (Julianti et al., 2023). This fear typically intensifies in the later stages of pregnancy and can have a profound impact on a woman's ability to make decisions and cope with the upcoming birth. Research indicates that pregnant women may experience varying levels of fear, from mild to moderate to severe, with this fear being associated with several negative outcomes. These include complications during pregnancy and childbirth, an increased likelihood of cesarean sections, postpartum depression, and delays in labor (Zhang et al., 2023). Given these potential consequences, it is essential to provide both physical and mental support to pregnant women to help them manage and alleviate their fear of childbirth (Koyuncu & Bülbül, 2021).

Abstract

Objective: This study aimed to examine the effect of structured exercise on FOC among pregnant women.

Method: The study utilized a quasi-experimental design with a two-group pre-test and post-test format. A total of 52 pregnant women were selected through convenience sampling, with 26 women in the intervention group and 26 women in the control group. Data were collected using the WDEQ-A questionnaire to measure FOC. The intervention group received structured exercise over 3 weeks, with the first week dedicated to providing information about pregnancy exercises and two weeks of exercise, twice a week, with each session lasting 30 minutes. Data analysis included Wilcoxon, Mann-Whitney, and ANCOVA tests.

Results: The results indicated a significant reduction in FOC in the intervention group, with a mean square of 5374.105, $F = 54.023$, and a significance value of 0.000 ($p < 0.005$). This demonstrates a strong effect of structured exercise on reducing FOC.

Conclusion: Structured exercise was found to be effective in lowering FOC among pregnant women. Given these findings, it is recommended that structured exercise be integrated into prenatal care routines to help reduce the fear of childbirth. Health professionals should enhance education and provide adequate facilities to support pregnant women in engaging in these exercises, ultimately improving their childbirth experience.

Keywords: Structured, Exercise, Fear of Childbirth, Pregnant Women

Fear of childbirth known as FOC is usually known as a negative birth that will cause injury to the baby, urinary tract, and even death (Julianti et al., 2023). This fear is more common in mothers who are pregnant for the first time. FOC can lead to negative birth outcomes such as labor dystocia, more frequent use of epidurals, increased demand for elective cesarean section (CS), and obstetric complications. In addition, FOC has been associated with increased fetal heart rate and decreased fetal motility in the womb and continues to affect the baby after birth (Zhou et al., 2021).

Psychosocial factors are strongly associated with FOC and previous research has revealed that depression is strongly associated with FOC among women who are newly pregnant for the first time, with FOC most commonly appearing in individuals who lack social and psychological resources (Han et al., 2022). Pregnancy is a time of happiness and gives positive hope to mothers and families, but it can also be a major event in life that involves psychological and physiological changes (Marfuah et al., 2022). Antenatal depression is an important social health problem because it has the potential to have harmful

effects on mothers such as postpartum depression, and adverse outcomes for the baby (Zhou et al., 2021)

The fear of giving birth is a mental health problem that often occurs in pregnant women around the world. Fear of giving birth occurs in 20-25% of pregnant women in Europe with varying degrees ranging from mild to severe (Molgora et al., 2018). Previous research has shown high variation in birth fears in Europe, Australia, Asia, and India, which are 11%, 4.8%, 10.6%, and 17.7%, respectively. In Indonesia, data on the fear of childbirth shows that 69% of pregnant women are afraid of facing moderate labor (Marcelina et al., 2019).

Data from the World Health Organization (2010) shows that about 8-10% experience anxiety during pregnancy. Anxiety in pregnant women has the potential to cause depression in pregnancy. This condition is certainly also not good for the fetus it is carrying (Ministry of Health, RI, 2019). Several developing countries in the world have a high risk of psychological disorders in pregnant women at 15.6% and postpartum mothers at 19.8%, including Ethiopia, Nigeria, Senegal, South Africa, Uganda, and Zimbabwe (Muliani, 2022).

In the third trimester, changes in the body's physiology will increase feelings of anxiety and cause fear of childbirth (Ariska & Marfuah, 2019). In addition, physical and physiological changes in pregnant women will trigger situations such as antenatal depression, one of the symptoms of antenatal depression, namely fear of giving birth. Depression is a complication that is difficult to control, therefore action is needed to avoid unwanted things such as changes in fetal brain development, premature birth, and others (Aquino, 2020). Exercise is beneficial for pregnant women without risk and side sensation as long as it is done at moderate intensity and supervised by a professional (Sánchez-Polán et al., 2021).

Exercise is a physical activity or healthy lifestyle habit that can be changed. Patients can participate in planned, tailored, and supervised exercise programs, which have proven to be safe and more beneficial than unsupervised exercise to improve and maintain health (Franklin et al., 2020) According to research (Kiik et al., 2018) Inactivity during pregnancy has a detrimental impact on both the woman and the fetus, in the prenatal phase women who do not exercise ignore many health benefits (Chan et al., 2019) said that physical activity interventions, useful for weight loss during pregnancy, and relaxation of pregnancy-related symptoms, such as depression and pregnancy-related pain. Exercise has the potential to help overcome barriers to increasing physical activity levels among pregnant women (Chan, Au Yeung, & Law, 2019).

But in pregnant women, physical-related interventions only support physical health that is not only physically healthy but also psychologically healthy. According to research (Septiana, 2020), exercise is a physical activity

that aims to make it easier for babies to be born quickly, safely, and spontaneously. However, the participation of pregnant women in exercising is influenced by several factors such as knowledge, education, and also the work of pregnant women (Marfuah et al., 2024). Based on the above background, researchers were interested to know the effectiveness of Structured Exercise on FOC in pregnant women.

METHODS

Study Design

This quantitative experimental study employed a pretest-posttest group design and was conducted at midwife clinics in Bandung, West Java, from March to June 2023. The independent variable was structured exercise, while the dependent variable was the fear of childbirth.

Intervention Procedure

In this study, the intervention group participated in a structured exercise program designed to support their physical health during pregnancy. The exercise regimen consisted of three phases: warm-up, pregnancy exercise core movements, and relaxation closing movements.

In the first week, participants were provided with detailed information about pregnancy exercise through two sessions, each lasting 60 minutes. These educational sessions aimed to familiarize the participants with the benefits and techniques of pregnancy exercises, ensuring they understood the importance of safe and appropriate physical activity during pregnancy. Starting from the second week, the intervention group engaged in the structured exercise program, which was conducted at least twice a week. Each session lasted 30 minutes, incorporating the three main phases; warm-up activity; pregnancy exercise core movements; and relaxation closing movements.

The structured exercise program was implemented over a period of three weeks, with the second and third weeks dedicated to the exercise sessions. This approach allowed the participants to gradually incorporate physical activity into their routine, ensuring both safety and effectiveness in supporting their physical well-being during pregnancy.

Sample

The sample size was determined using G*Power 3.1.9.4 software, with a t-test for ANCOVA (Fixed Effect, main effect, and interactions), an effect size f of 0.5, α error probability of 0.05, power of 0.9, and two groups with one covariate. The result indicated a sample size of 45, with an additional attrition rate of 20%, bringing the total sample to 52 respondents. The purposive sampling technique was used, with 26 respondents in the intervention group and 26 in the control group. Inclusion criteria consisted of pregnant women in their second or third trimester, with healthy pregnancies, who voluntarily signed informed consent to

participate in the study. Both pre-test and post-test measures were taken for both groups.

Research Instrument

In this study, two instruments were used to collect data. The first was a questionnaire to gather respondents' characteristics, and the second was the WDEQ-A (Wijma Delivery Expectancy/Experience Questionnaire-Version A) to measure the Fear of Childbirth. The WDEQ-A is a well-established instrument, with reliability proven to be very good (0.90 or higher) in various studies. The interpretation of the WDEQ-A score is as follows: A score of 100 or more on the WDEQ-A scale indicates "clinical fear of childbirth," meaning that the woman experiences fear that disrupts her personal life, work, studies, family, and social activities. The scale uses a 6-point Likert scale for responses, with scores ranging from 0 to 165 (0-5 for each of the 33 items). A sum score of 85 indicates severe fear, while a score above 100 signifies clinical fear of childbirth, where the fear significantly impacts daily life activities such as work, studies, and leisure time.

Data Analysis

In this study, the data analysis involved both univariate and bivariate approaches. Univariate analysis was conducted using descriptive statistics to summarize the characteristics of the respondents and the main variables. For bivariate analysis, the Wilcoxon Matched Pair test was used to compare the pre-test and post-test scores within the same group (intervention or control), to assess the effect of the intervention on the fear of childbirth. Meanwhile, the Mann-Whitney Test was used

to compare the post-test scores between the intervention and control groups, assessing if there were significant differences between the two groups after the intervention. Moreover, ANCOVA was used to examine the effect of the intervention while controlling for potential confounding variables, providing a more accurate assessment of the intervention's impact on fear of childbirth.

Ethical Consideration

The data for this study was collected three weeks after receiving ethical clearance from the Health Research Ethics Committee of STIKep PPNI Jawa Barat, with approval number III/019/KEPK-SLE/STIKEP/PPNI/JABAR/V/2023.

RESULT

This study aimed to determine the effect of structured exercise training on the fear of childbirth among pregnant women. Respondent characteristics were analyzed based on age, education, occupation, trimester, and parity. The results showed that the majority of participants in the intervention group were aged between 17 and 25 years, while in the control group, most were aged between 36 and 45 years. In terms of education level, both the intervention and control groups had a similar majority with senior high school as the highest level of education. Regarding occupation, most respondents in both groups were unemployed. For trimester and parity characteristics, both groups predominantly consisted of women in their third trimester and were primigravida (first-time pregnancies).

Table 1. Characteristics of Respondents in intervention and control groups (n=52)

Variables	Intervention (n=26)	Control (n=26)	p-value
17-25	13(48.1%)	10(38.5%)	0.512
26-35	11(40.7%)	14(53.9%)	
36-45	2(7.4%)	2(7.7%)	
Educational Background			
Elementary School	1(3.7%)	1(3.8%)	0.014
Junior High School	3(11.1%)	2(7.7%)	
Senior High School	12(44.4%)	14(53.8%)	
College	10(37%)	9(34.6%)	
Occupation			
Employee	7(25.9%)	10(38.5%)	0.529
Unemployed	19(70.4%)	16(61.5%)	
Trimester			
Second Trimester	6(22.2%)	8(30.8%)	0.393
Third Trimester	20(74.1%)	18(69.2%)	
Parity			
Primigravida	19(73.1%)	14(53.8%)	0.117
Multigravida	7 (26.9%)	12(46.2%)	

*All the data analyzed by Chi-square test, p-value <0.05

To analyze the homogeneity of respondent characteristics, a chi-square test was conducted. The results indicated that there was no significant difference between the two groups, as the p-values were greater than the significance level (p-value > 0.05). This suggests that the groups were comparable in terms of their demographic characteristics, including age, education, occupation, trimester, and parity, ensuring that the groups were homogeneous for the analysis.

Table 2. Frequency Distribution of FOC between Intervention and Control Groups

Group	Category	Frequency	Mean ± SD	
			Pre-test	Post-test
Intervention	Intense/severe fear of childbirth	24	3.08±0.272	1.73±0.452
	Clinically fear of childbirth	2		
	Mild fear of childbirth	7	3-4	1-2
	Moderate fear of childbirth	19		
Control	Mild fear of childbirth	2	2.58±0.809	2.42±0.758
	Moderate fear of childbirth	10		
	Intense/severe fear of childbirth	11		
	Clinically fear of childbirth	3	1-4	1-4
	Mild fear of childbirth	2		
	Moderate fear of childbirth	13		
Post-test	Intense/severe fear of childbirth	9		
	Clinically fear of childbirth	2		

Based on Table 2, the data indicates that the intervention group initially exhibited severe and clinical levels of fear of childbirth before the intervention. Following the structured exercise training, a notable reduction in the severity of fear was observed within this group. Conversely, the control group showed minimal changes in the levels of fear of childbirth, suggesting that the intervention had a significant impact in alleviating fear in the intervention group.

Table 3. Results of the test of different severity of fear of childbirth of the intervention and the control group before and after the intervention

Group	Mean		SD		p-value
	Pre-test	Post-test	Pre-test	Post-test	
Fear of Intervention	72.12	46.65	6.507	10.186	0.000
Childbirth Control	65.81	64.00	14.969	13.635	0.300

Based on Table 3, the findings demonstrate a significant reduction in the fear of childbirth (FOC) levels in the intervention group after structured exercise training. The mean FOC score in the intervention group decreased from 72.12 (\pm SD 6.507) at the pre-test to 46.65 (\pm SD 10.186) at the post-test, with a statistically significant p-value of 0.000 ($\alpha < 0.05$). In contrast, the control group showed minimal changes, with the mean FOC score decreasing slightly from 65.81 (\pm SD 14.969) at the pre-test to 64.00 (\pm SD 13.635) at the post-test, and a p-value of 0.300 ($\alpha < 0.05$), indicating no significant change.

Table 4. Test Results of Different FOC in Intervention and Control Groups

Group	Z	p-value
Fear of Intervention	-4.294	0.000
Childbirth Control		

To evaluate the effectiveness of structured exercise in reducing fear of childbirth (FOC), the Mann-Whitney statistical test was applied. The analysis yielded a Z value of -4.294, which is greater than the threshold of -1.96, indicating a significant effect of the intervention. Additionally, the p-value obtained was 0.000 ($\alpha < 0.05$), confirming that the results were statistically significant. These findings support the hypothesis (H_a) that structured exercise interventions effectively reduce FOC in pregnant women, with a notable change observed between the intervention and control groups.

Table 5. Results of ANCOVA test of the Intervention and Control Group on FOC

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6279.051 ^a	2	3139.526	31.560	.000
Intercept	275.498	1	275.498	2.769	.102
PRETES	2367.494	1	2367.494	23.799	.000
GROUP	5374.105	1	5374.105	54.023	.000
Error	4874.391	49	99.477		
Total	170329.000	52			
Corrected Total	11153.442	51			

Based on the results in Table 5, analyzed using the ANCOVA test, the Fear of Childbirth (FOC) score for the group not given Structured Exercise showed a mean square value of 5374.105, an F value of 54.023, and a significance (Sig) value of 0.000 ($p < 0.005$). These results confirm the acceptance of the alternative hypothesis (H_a) and the rejection of the null hypothesis (H_0), indicating a significant influence of Structured Exercise on FOC levels in pregnant women. This underscores the effectiveness of Structured Exercise in reducing FOC.

DISCUSSION

Differences in FOC levels in pregnant women before and after the intervention in the intervention group and the control group

The difference in FOC levels in pregnant women based on the Wilcoxon test in the intervention group before and after the intervention was given Structured exercise using the WDEQ-A questionnaire measuring tool and calculated as a whole using SPSS where the results were obtained with a negative rank value of 26 where there was a decrease from the pre-test score to the post-test and the positive rank value was 0 where there was no increase in FOC from the pre-test value to the post-test and it was known A symp. sig (2 tailed) with a value of 0.000 ($\alpha < 0.05$), it can be concluded that there is a change in the decrease in fear of childbirth in the intervention group H_0 was rejected by H_a .

In the results of the Wilcoxon test of the intervention group, there was a tie value or the pre-test and post-test equation in the WDEQ A questionnaire with a value of 0, which means that there were no respondents with the same score between the pre-test and post-test. These results are supported by a study in the UK by Newham and colleagues found that exercise during pregnancy was associated with a significant decrease in fear of childbirth. In addition, Newham's research found that exercise before pregnancy can help mothers avoid depression both during pregnancy and after childbirth (Klankhajhon & Sthien, 2022). This is because exercising during pregnancy lowers cortisol levels and anxiety. A review of Stoll's studies on overcoming the fear of childbirth also found that antenatal exercise helps women create strategies to overcome their fear of childbirth (Astuti et al., 2023). Other studies show that yoga or exercise can help pregnant women relieve symptoms of depression (Perales et al., 2023). An overall effect analysis showed that yoga intervention or pregnancy exercise significantly reduced the rate of depression in mothers before childbirth (Stoll et al., 2018)

Differences in FOC levels in pregnant women who have been given pre-test and post-test in the control group.

Based on the results of the Wilcoxon test that has been given pre-test, post-test, and also

power point in the control group, the result was that the negative rank value was 8 which showed that 8 pregnant women experienced a decrease from the pre-test value to the post-test value and in the positive rank there was 6 which means that there were 6 respondents who experienced an increase in FOC From the pre-test value to the post-test, in the TIES value there are 12 which means that 12 respondents have the same filling in the pre-test to the post-test and the Asymp value is known. Sig (2-tailed) is 0.300 ($\alpha < 0.05$), so it can be concluded that there was no change in the value of increase and decrease between the pre-test and post-test in the control group, which means that H_0 was accepted and H_a was rejected.

In the control group, respondents were not given intervention but were immediately given a pre-test when conducting control in the clinic. The change in pre-test and post-test scores is also supported by research conducted by (Koyuncu & Bülbül, 2021) The self-efficacy of pregnant women in the control group increased, and their fear of childbirth increased. These results suggest that pregnant women who have a high fear of childbirth experience increased helplessness and low self-esteem, which decreases their self-efficacy (Khademioore et al., 2023).

Differences in FOC levels in pregnant women in the control group and intervention group as well as the effect of Structured Exercise therapy in pregnant women.

From the results of the Mann-Whitney test on FOC, Z -4,294 ($a > -1.96$) was obtained. The value of Z stated that the intervention of structured exercise for FOC in pregnant women. The results of the statistical test in the intervention group and the control group on FOC obtained a p-value = 0.000 ($\alpha < 0.05$), then H_a was accepted, which means that there was a change in the structured exercise for FOC in pregnant women.

Based on the results of the ANCOVA analysis, it show that there is an effect of Structured Exercise therapy on pregnant women with a value = 0.000 ($\alpha < 0.05$) on FOC. The results of this study are in line with research conducted by (Stoll et al., 2018) that there was a greater decrease in the severity score of childbirth in the intervention group compared to the control group, which means that there was a significant relationship between the interventions carried out and the reduction of fear of childbirth. In research (Gong et al., 2015) it was said that yoga intervention or pregnancy exercise can significantly help reduce maternal depression before childbirth. Review of the study (Shirzad et al., 2020)

Structured exercise focuses on reducing the fear of childbirth and reducing depression in pregnant women with structured and supervised

exercise (Marfuah et al., 2024). Yoga or pregnancy exercise has been shown to be effective in improving maternal and fetal health, data reduce fear of childbirth (Astuti et al., 2023). However, Septiana, M. (2020) said that pregnant women's participation in gymnastics is still not motivated due to several influencing factors such as education, knowledge, and also work.

CONCLUSIONS

Based on the results of the research that has been carried out, researchers delivered that Structured Exercise can reduce the fear of childbirth in pregnant women. Therefore, it can be concluded that the intervention of structured exercise can be used as one of the efforts to reduce the fear of childbirth in pregnant women. Therefore, it is hoped that health workers can improve education and facilities to do structured exercise so that the fear of childbirth in pregnant women is reduced. For the next researcher, the results of this study are expected to be useful as a reference for data sources to further develop this research.

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Conflict of interest

All the authors declare no conflict of interest.

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