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Pregnancy school education program in mother friendly training and research hospital impact on stress and anxiety

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SUMMARY

OBJECTIVE: This study aimed to investigate prenatal education and its relationship with anxiety and stress in pregnant women.

METHODS: This research was carried out between July 1, 2022, and December 1, 2023, at Giresun Gynecology and Pediatrics Training and Research Hospital. Women aged >18 years at >20 weeks of pregnancy were included. Patients were randomized into two groups, and one group received a 4 week training on meditation, breathing exercises, and pregnancy-related health issues. A questionnaire was applied to both groups to analyze sociodemographic characteristics, pregnancy, birth, medical history, the Pregnancy Stress Rating Scale, and the State Trait Anxiety Inventory.

RESULT: The groups were similar in terms of age, educational status, anthropometric characteristics, occupation, economic status, and gestational week. There was no difference between the trained and nontrained groups in terms of the Pregnancy Stress Rating Scale score and the State Trait Anxiety Inventory-state score. The State Trait Anxiety Inventory-trait was significantly lower in the trained group (p=0.033). There were weak positive correlations between Pregnancy Stress Rating Scale score and medication use and between State Trait Anxiety Inventory-state score and age. A negative correlation was found between the State Trait Anxiety Inventory-state score and working status, showing that employed women had lower anxiety scores irrespective of training. Another weak positive correlation was found between the State Trait Anxiety Inventory-trait score and the presence of comorbidities.

CONCLUSION: State Trait Anxiety Inventory-trait anxiety was lower in pregnant women who received training on prenatal meditation, exercise, and pregnancy health; however, State Trait Anxiety Inventory-state and Pregnancy Stress Rating Scale scores were similar in the two groups. Unemployed pregnant women and those with chronic diseases appear to need closer follow-up to reduce anxiety levels.

KEYWORDS: Pregnancy. Maternal health. Prenatal care. Health education. Prenatal education. Anxiety.

INTRODUCTION

Pregnancy brings biological, psychological, and social changes in women, which may lead to stress, anxiety, and depression to varying degrees throughout this period[1]. Care for the emotional state of pregnant women remains a neglected aspect of obstetric medicine. Depression, anxiety, and stress during pregnancy can often go undetected or untreated[2].

Prenatal anxiety symptoms can have negative health consequences not only for the expectant mother, but also for the unborn baby[3]. Low birth weight, a smaller head circumference, spontaneous preterm birth, preterm birth, emotional problems, symptoms of attention deficit hyperactivity disorder, or impaired cognitive development may occur in children of mothers who experienced depression, anxiety, or stress during pregnancy[2,4]. Therefore, it is crucial for the physical and mental health of the mother and the baby to evaluate and reduce the anxiety and stress of pregnant women.

While factors such as young age, low education level, incompatibility in family relationships, low life satisfaction, and lack of social support are among the reported risk factors for stress, anxiety, and depression encountered in the prenatal period, it has been reported that exercise has a protective effect[1]. Providing prenatal training to mothers has been shown to increase the resilience of pregnant women against anxiety and stress, which may lead to a reduced likelihood of depression and anxiety disorders as well as improved physiological characteristics[5].

The aim of this study was to evaluate the levels of anxiety and stress in pregnant women with and without prenatal education.

METHODS

This cross-sectional study was carried out between July 1, 2022 and December 1, 2022, at Giresun Gynecology and Childhood

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Education and Research Hospital. Ethics committee approval for the research (dated June 4, 2022, number: E-50288587-050.01.04-93332) was received from the Scientific Ethics Committee of Giresun University. The authors declared that it has been conducted in accordance with the Declaration of Helsinki.

The research was carried out in Giresun Gynecology and Pediatrics Training and Research Hospital with women aged 18 years and over 40 years who had been pregnant for at least 5 months (>20 weeks of gestation). Pregnant women who applied to the outpatient clinic for routine follow-ups were randomized into two groups with respect to prenatal training. Pregnant women in the training group were enrolled in a "pregnant school" with a training program including meditation, breathing exercises, and theoretical and physical training for childbirth. Ministry of Health pregnant school training is given by a certified nurse for 1 h daily per week for a total of 4 weeks[6]. A structured "controlled frequency breathing technique" helps women in the antenatal period distract themselves from negative emotions through breathing exercises[7]. Pregnant women who had a risky pregnancy, had a history of psychiatric disease or had received medication for a psychiatric condition, had divorced, or did not accept to participate in the study were not included.

After giving detailed information about the purpose and scope of the study to the pregnant women included in the study group, written consent was obtained from those who agreed to participate in the study. As part of the training, breathing and straining techniques were taught to the pregnant women who attended the pregnant school. The lessons were provided in the form of oral lectures, brochures, slide presentations, and practical demonstrations. The knowledge and characteristics of women who received training were assessed after 4 weeks of training using a questionnaire. The results were compared by applying the same questionnaire form to the pregnant women who accepted to participate in the study but were not enrolled in the pregnant school.

The questionnaire included questions about women's sociodemographic characteristics, pregnancy, birth, medical history, the Pregnancy Stress Rating Scale (PSRS-36), and the State Trait Anxiety Inventory (STAI).

Pregnancy Stress Rating Scale

The PSRS, which was used to assess pregnancy-related stress, was developed by Chen and colleagues, and its Turkish validity and reliability study was performed by Akın. The PSRS-36 consists of 5 sub-dimensions and 36 items. Each scale item received a response in a 5-point Likert-type system, scored between 0 and 4. The total score that can be obtained from the scale varies between 0 and 144, and as the score obtained from the scale increases, it is interpreted as an increase in pregnancy-related stress[8,9].

State Trait Anxiety Inventory

The STAI was used to evaluate the anxiety level of pregnant women. The Turkish validity and reliability study of STAI was performed by Öner and Le Compte. The scale consists of 2 sub-dimensions of 20 items each, which assess state anxiety (perceived anxiety in a temporary state) and trait anxiety (characteristic anxiety levels). The feelings and behaviors expressed by the person in the scale items are graded as "never=1, sometimes=2, often=3, always=4." Items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 in the STAI-state sub-dimension scored inversely. In the STAI-trait sub-dimension, items 21, 26, 27, 30, 33, 36, and 39 are scored inversely. The score that can be obtained from each sub-dimension of the scale varies between 20 and 80, and as the score increases, the level of anxiety is expected to increase[10,11].

Statistical analysis

All analyses were evaluated with a $p<0.05$ threshold for statistical significance and were performed on IBM SPSS Statistics for Windows, Version 25.0 (IBM, NY, USA). For the normality check, the Kolmogorov-Smirnov test was used. Data are given as mean±standard deviation or median (1st–3rd quartile) for continuous variables according to normality of distribution, whereas absolute and relative frequencies are reported for categorical variables. Normally distributed variables were analyzed with the independent samples t-test. Non-normally distributed variables were analyzed with the Mann-Whitney U test. Spearman correlation coefficients were calculated to evaluate the directional relationships between continuous variables. Categorical variables were analyzed with appropriate chi-square tests (Pearson, Yate's continuity correction) or Fisher's exact tests.

RESULTS

There were 110 pregnant women in the study group, 55 of whom received training and 55 did not. Trained and non-trained women were similar in terms of age (p=0.554), educational status (p=0.180), height (p=612), weight (p=0.893), BMI (p=0.928), occupation (p=0.843), economic status (p=0.101), and gestational week (p=1.000).

Gravidity (p<0.001) and parity (p<0.001) were higher in the control group. There was no difference between the groups in terms of history of abortion (p=0.348) or stillbirth (p=0.271). The frequency of having more than one living child

was higher in the control group (p<0.001). The frequency of medication use was higher in pregnant women who received training (p<0.001). Comorbidities were more common in training recipients (p=0.015). In terms of the PSRS-36 score, there was no difference between trained and nontrained women (p=0.368). While the groups were similar in terms of STAI-state score (p=0.198), the STAI-trait score was significantly lower in training recipients (p=0.033, Table 1).

There was a weak positive correlation between the PSRS-36 score and medication use (r=0.247, p=0.009). The STAI-state score was positively but weakly correlated with age (r=0.240, p=0.011), while it was negatively but weakly correlated with working status (r=-0.328, p<0.001), indicating that employed women had lower anxiety scores. A very weak positive correlation was found between the STAI-trait score and the presence of comorbidity (r=0.191, p=0.046) (Table 2).

Table 1. Summary of individual characteristics with regard to groups.

	Groups		p-value
	Control (n=55)	Trained (n=55)	
Age, years			
18–25	14 (25.4%)	19 (34.5%)	0.554
25–35	32 (58.2%)	27 (49.1%)	
35–40	9 (16.4%)	9 (16.4%)	
Education status			
Primary school	3 (5.5%)	2 (3.6%)	0.180
Secondary school	13 (23.6%)	5 (9.1%)	
High school	16 (29.1%)	22 (40%)	
University	23 (41.8%)	26 (47.3%)	
Body mass index, kg/m^2	28.45±5.18	28.53±3.96	0.928
Occupation			
Unemployed	21 (38.2%)	19 (34.5%)	0.843
Employed	34 (61.8%)	36 (65.5%)	
Economic status			
Above minimum wage	33 (60.0%)	42 (76.4%)	0.101
Below minimum wage	22 (40.0%)	13 (23.6%)	
Gestational week			
20–28	35 (63.6%)	34 (61.8%)	1.000
>28	20 (36.4%)	21 (38.2%)	
Abortus history	14 (25.5%)	9 (16.4%)	0.348
Stillbirth history	6 (10.9%)	2 (3.6%)	0.271
Medication use	7 (12.7%)	26 (47.3%)	**<0.001**
Comorbidities	3 (5.5%)	13 (23.6%)	**0.015**
Diabetes mellitus	0 (0.0%)	2 (3.6%)	0.495
Hypertension	0 (0.0%)	0 (0.0%)	N/A
Hypothyroidism	3 (5.5%)	11 (20.0%)	**0.045**
Other	0 (0.0%)	0 (0.0%)	N/A
Pregnancy Stress Rating Scale-36 score	93.40±28.44	88.93±23.18	0.368
State-Trait Anxiety Inventory			
State score	42 (37–45)	42 (40–47)	0.198
Trait score	49 (44–53)	47 (43–50)	**0.033**

Data are given as mean±standard deviation or median (1st–3rd quartile) for continuous variables according to normality of distribution and as frequency (percentage) for categorical variables. N/A: non-applicable. Bold values indicate statistical significance at the p<0.05 level.

Table 2. Relationship between assessment scores and other characteristics.

		Pregnancy Stress Rating Scale-36 score	STAI state score	STAI trait score
Age	r	-0.069	**0.240**	0.103
	p	0.474	**0.011**	0.284
Education status	r	0.038	0.005	-0.087
	p	0.690	0.961	0.367
Occupation, employed	r	-0.049	**-0.328**	-0.143
	p	0.613	**<0.001**	0.137
Economic status, below minimum wage	r	0.101	-0.136	0.065
	p	0.295	0.156	0.502
Gestational week	r	-0.096	-0.118	-0.099
	p	0.318	0.219	0.303
Number of pregnancies	r	0.020	-0.025	-0.047
	p	0.833	0.795	0.624
Number of deliveries	r	-0.022	-0.054	0.025
	p	0.821	0.572	0.793
Abortus history	r	0.101	-0.070	-0.169
	p	0.293	0.468	0.077
Stillbirth history	r	0.125	0.078	-0.091
	p	0.195	0.418	0.346
Number of children	r	-0.084	-0.036	0.049
	p	0.384	0.707	0.608
Medication use	r	**0.247**	0.057	0.002
	p	**0.009**	0.556	0.982
Comorbidity	r	0.148	0.073	**0.191**
	p	0.122	0.452	**0.046**

r: Spearman correlation coefficient. Bold values indicate statistical significance at the $p<0.05$ level.

DISCUSSION

Among the effective interventions used to improve the mental health of the mother during pregnancy, interventions such as relaxation techniques are important because they are non-pharmacological[12]. In this study, we found lower scores for STAI-trait among training recipients; however, STAI-state and PSRS scores were similar in the two groups.

Despite similarities in demographic and various other characteristics, the groups in the study showed a heterogeneous distribution in terms of the number of pregnancies and births. The frequency of nulliparous women was significantly higher in those who received training compared to the control group, as demonstrated by the fact that 90.9% of them had never given birth. Pregnancy is considered a period of increased emotional vulnerability, especially when experienced for the first time[13]. According to the results in the literature, it is seen that the stress levels of pregnant women often decrease after training. As such, it is possible that the effect of training in the present study was not observed due to high baseline stress among nulliparous women, illustrating a potential confounder.

In a study by Woods et al. it was reported that having a medical comorbidity was significantly associated with higher psychosocial stress[14]. In another study, it was reported that those with chronic diseases had significantly higher stress[15]. In the presence of a chronic disease or condition that requires medication, pregnant women may perceive themselves as being unhealthy, which could elevate pregnancy-related stress due to concerns for the impact of their disease or medications on the health of their baby. It may be beneficial to closely monitor pregnant women with chronic diseases that will require continuous drug use, particularly with the utilization of intervention

programs that can alleviate concerns regarding chronic conditions and medication use.

Although the correlations revealed by the present study are weak, it may be valuable to mention these findings in the context of available literature. It has been reported that being unemployed and having a comorbidity are risk factors for pregnancy anxiety[16]. In a study by Tang et al. it was reported that the frequency of anxiety was significantly higher in unemployed pregnant women[1], which is consistent with our correlation results. Despite the low effect sizes observed from these analyses, it may be useful to carefully monitor unemployed pregnant women and those with chronic diseases in terms of anxiety disorders.

Antenatal anxiety is a common psychological disorder during pregnancy. In a meta-analysis evaluating the data of 221,974 pregnant women (including studies from 34 countries), the prevalence of any anxiety disorder was estimated to be 15.2%, and the prevalence of generalized anxiety disorder was 4.1% throughout pregnancy[17]. Ideally, for women who develop anxiety or have an anxiety disorder before pregnancy, interventions should begin before pregnancy. Non-pharmacological and pharmacological interventions are available for this purpose. In a study by Ponting et al. it was reported that the level of state anxiety was lower in women who were trained for stress management compared to those who did not complete the intervention[18]. Shen et al. reported that the anxiety level of the pregnant women who were given five needs-based education programs by trained researchers was significantly lower than that of the control group[19]. In another study conducted with pregnant women at risk of preterm birth, it was reported that trait and situational anxiety decreased significantly in women who were given counseling support[20]. A systematic review of psychological interventions described moderate improvements in anxiety-related findings among pregnant women[21]. However, the method and route of training appear to be important factors affecting the uptake of information and the outcomes of training recipients, as shown by unchanged anxiety levels in a systematic review examining pregnant women who received Internet-based training[22]. In the present study, while the trait anxiety score was found to be lower in pregnant women who attended the pregnant school, supporting the literature, the groups were similar in terms of state anxiety. Educational programs to be added to routine prenatal follow-ups in pregnant women may be beneficial in reducing the level of anxiety; however, it is evident from the literature that the methodology of these training programs is crucial for their success.

This research has some limitations. Pregnant women were selected from a single institution, so our results are not representative of the population. Another limitation is that stress and anxiety were assessed via questionnaires without any clinical interviews.

CONCLUSION

This study shows that the presently used training program offered in antenatal care services is associated with lower trait anxiety levels in recipients. Nonetheless, considering the correlation results for STAI-state, this study demonstrates that unemployed pregnant women and those with chronic diseases must be followed more closely to reduce anxiety levels and prevent the development of anxiety disorders. There is a need for population-based, prospective, longitudinal studies to assess pregnancy school practices in different age groups and especially in the disadvantaged sections of society.

AUTHORS' CONTRIBUTIONS

AA: Conceptualization, Funding acquisition, Project administration, Supervision, Visualization, Writing – original draft, Writing – review & editing. **SÖ:** Data curation, Writing – review & editing. **ŞAT:** Formal Analysis, Investigation, Methodology, Resources, Validation, Writing – original draft, Writing – review & editing.

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