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Research Article | Araştırma Makalesi

ARE ANXIETY AND DEPRESSION SYMPTOMS ASSOCIATED WITH PREGNANT WOMEN'S PREFERENCE FOR CESAREAN DELIVERY?

ANKSİYETE VE DEPRESYON BELİRTİLERİ, HAMİLE KADINLARIN SEZARYEN DOĞUM TERCİHİYLE İLİŞKİLİ Mİ?

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ABSTRACT

Objective: The aim of this study was to investigate whether anxiety and depression symptoms are associated with preference for cesarean delivery among pregnant women.

Methods: A total of 404 pregnant women without medical or obstetric indications for cesarean section were included in this cross-sectional study. Data were collected using a questionnaire comprising a Descriptive Information Form and the Hospital Anxiety and Depression Scale (HADS). Descriptive statistics, Pearson's chi-square test, and multivariate logistic regression analysis were used for data analysis.

Results: A total of 22.5% of the pregnant women preferred cesarean delivery in the absence of medical or obstetric indications. Among pregnant women who preferred cesarean delivery, 68.1% reported fear of vaginal delivery as the main reason for this preference. According to the HADS cut-off points, 14.9% of the pregnant women had anxiety, and 4.5% had symptoms of depression. After adjustment for potential confounders, anxiety symptoms were associated with higher odds of preference for cesarean delivery (adjusted odds ratio [AOR]: 2.47; 95% CI: 1.27–4.78), and depression symptoms were also associated with higher odds of preference for cesarean delivery (AOR: 3.25; 95% CI: 1.14–9.25), compared with pregnant women without these symptoms.

Conclusion: In this cross-sectional study, anxiety and depression symptoms were significantly associated with pregnant women's preference for cesarean delivery. Accordingly, pregnant women should be evaluated psychiatrically during the first trimester, preventive interventions should be planned for women at risk for anxiety and depression, and all pregnant women should be informed about delivery methods to reduce the demand for cesarean delivery.

Keywords: Pregnancy, elective cesarean section, anxiety, depression, vaginal delivery

ÖZ

Amaç: Bu çalışmanın amacı, anksiyete ve depresyon belirtilerinin gebelerin sezaryen doğum tercihi ile ilişkili olup olmadığını araştırmaktır.

Yöntem: Bu kesitsel çalışmaya, sezaryen için tıbbi veya obstetrik endikasyonu olmayan toplam 404 hamile kadın dahil edilmiştir. Veriler, Tanımlayıcı Bilgi Formu ve Hastane Anksiyete ve Depresyon Ölçeği (HADS) içeren bir anket kullanılarak toplanmıştır. Veri analizi için tanımlayıcı istatistikler, Pearson ki-kare testi ve çok değişkenli lojistik regresyon analizi kullanılmıştır.

Bulgular: Hamile kadınların %22,5'i herhangi bir tıbbi endikasyon olmaksızın sezaryen doğum talep etmiştir. Bu hastaların %68,1'i vajinal doğumdan korktukları için sezaryen doğum talep etmiştir. HADS kesme noktalarına göre, hamile kadınların %14,9'unda anksiyete ve %4,5'inde depresyon belirtileri görülmüştür. Potansiyel karıştırıcı faktörler için düzeltme yapıldıktan sonra, anksiyete belirtileri sezaryen doğum tercihi ile daha yüksek olasılık düzeyinde ilişkiliydi (düzeltilmiş odds oranı [AOR]: 2,47; %95 GA: 1,27–4,78). Benzer şekilde, depresyon belirtileri de sezaryen doğum tercihi ile daha yüksek olasılık düzeyinde ilişkiliydi (AOR: 3,25; %95 GA: 1,14–9,25).

Sonuç: Bu kesitsel çalışmada, anksiyete ve depresyon belirtilerinin gebelerin sezaryen doğum tercihi ile anlamlı şekilde ilişkili olduğu bulunmuştur. Buna göre, hamile kadınlar ilk trimesterde psikiyatrik olarak değerlendirilmeli, anksiyete ve depresyon riski olan kadınlar için önleyici müdahaleler planlanmalı ve tüm hamile kadınlar sezaryen doğum talebini azaltmak için doğum yöntemleri konusunda detaylı bilgilendirilmelidir.

Anahtar Kelimeler: Gebelik, elektif sezaryen, anksiyete, depresyon, vajinal doğum

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Introduction

According to the World Health Organization (WHO), birth is defined as the termination of pregnancy after the 20th gestational week with the delivery of a fetus that weighs more than 500 g and has a head-heel distance of 25 cm or more.[1] Pregnancy and delivery are both physiological processes; in most cases, pregnancies end with vaginal delivery. Cesarean section is defined as the delivery of the fetus, placenta and appendages via an incision through the abdominal and uterine walls. Although there is a perception that cesarean section performed under elective conditions is safer, there are no scientific data indicating that it is safer than vaginal delivery.[2] Cesarean delivery is reported to be more prone to maternal mortality and morbidity than vaginal delivery in terms of bleeding, sepsis, amniotic fluid embolism and venous thromboembolism. Cesarean delivery also increases the risk of placenta previa, placenta acreata and uterine rupture in subsequent pregnancies.[3] Despite all this evidence, cesarean section rates continue to increase in Türkiye and the rest of the world. According to the latest data published by the Ministry of Health, the cesarean section rates in 2019, 2020 and 2021 were 57.0%, 59.6% and 60.9%, respectively. Notably, the primary cesarean section rate in public hospitals in Türkiye was 17.5% in 2021, whereas it was 42.3% in private hospitals.[4] Cesarean section reduces maternal and perinatal mortality and morbidity; however, studies have shown that cesarean section rates above 10% are not associated with a reduction in maternal and newborn mortality rates.[5] The main reasons for increased cesarean delivery frequency include the increasing age of first pregnancy due to mothers' career concerns and economic reasons, decreasing parity, birth anxiety, more frequent diagnoses of fetal distress, increases in multiple and preterm pregnancies due to increases in assisted reproductive techniques, and the possibility for physicians to face medico-legal problems even in cases of possible complications that may occur during vaginal delivery and personal requests of the expectant mother (cesarean section request without indication).[6,7] In addition to medical indications, social media, the guidance of pregnant women's family and friends, and the negative experiences of women who have a previous history of vaginal delivery have a negative impact on the perspective of vaginal delivery.[8] This leads to an increase in the demand for cesarean section, especially without indications. The fact that public hospitals do not traditionally perform cesarean section operations without indications causes patients to prefer private hospitals. Data from the Ministry of Health support this idea, which shows a significant difference in primary cesarean section rates between public and private hospitals.[4]

Pregnancy is a period of complex physiological and psychological changes in women. In addition to this process, the contribution of risk factors during pregnancy, such as advanced maternal age, negative experiences in previous pregnancies, substance abuse and chronic diseases, may lead to deterioration in the mood of pregnant women and may cause difficulties in decision making and in choosing a safe method for delivery. Therefore, this study aimed to investigate whether anxiety and depression symptoms are associated with preference for cesarean delivery among pregnant women. It is predicted that a decrease in cesarean section rates can be achieved by identifying pregnant women with anxiety and depression symptoms, investigating the delivery method preferences of these pregnant women, evaluating pregnant women who prefer cesarean delivery without medical indications along with other factors, and changing their preferences with correct information and psychological support to these patients.

Methods

Type of research, population and sample

This was a cross-sectional study. The population of the study included pregnant women followed up at the Obstetrics and Gynecology outpatient clinic of a Training and Research Hospital. The minimum sample size to be reached in the study was calculated as 311 patients with 80% power, α=0.05 significance level and d=0.02 effect size via the G*Power 3.1.9.7 program.[9,10] The 404 pregnant women who were followed up in the outpatient clinic between January 2024 and July 2024, who were aware of their ability to answer the research questions, who agreed to participate in the study, who had no medical or obstetric indications for cesarean section and who did not use any medication for anxiety or depression were included in this study.

Data collection tools

The data for the study were collected with a questionnaire including the descriptive information form and Hospital Anxiety and Depression Scale (HADS).[11]

Descriptive information form: Prepared by the researchers from the relevant literature and consisting of questions about pregnant women's age, education level, employment status, presence of chronic diseases, gestational week, number of pregnancies, history of pregnancy loss, etc.

Hospital Anxiety and Depression Scale (HADS): This scale was originally developed by Zigmond and Snaith in 1983 and was adapted into Turkish by Aydemir et al. in 1997. Validity and reliability studies were conducted. The Hospital Anxiety and Depression Scale (HADS) consists of 14 items. The item scores on the scale, which has four Likert-type response options, range from 0 to 3 points. The scale has two subdimensions: anxiety and depression. The anxiety subdimension score is calculated by the sum of the odd-numbered items in the scale, whereas the depression subdimension score is calculated by the sum of the even-numbered items. A minimum score of 0 and a maximum score of 21 can be obtained for each subdimension. According to the scores obtained from the subdimension Hospital Anxiety and Depression

Scale (HADS), 0–7 points is categorized as normal, 8–10 points as borderline and 11 points and above as sick.[11] In the study conducted by Aydemir et al.[12] the Cronbach's alpha coefficient was reported as 0.85 for the anxiety subdimension and 0.77 for the depression subdimension.

Data collection

As part of the study, pregnant women were informed about the purpose and scope of the study, and candidates were asked to sign the informed consent form. Participants who agreed to the informed consent form were administered the questionnaire by the researchers via a face-to-face interview.

Data analysis

The data were analysed via the Statistical Package for the Social Sciences (SPSS) 23.0. Counts, percentages, arithmetic means, and standard deviations were used as descriptive statistics, whereas the Pearson chi-square test was used to examine whether there were differences between categories of descriptive characteristics in pregnant women's preference for cesarean section as the delivery method. Multivariate logistic regression analysis (enter method) was used to investigate whether anxiety and depression were associated with pregnant women's preference for cesarean section as a delivery method. Anxiety (normal: 0, borderline: 1, anxiety: 2) and depression (normal: 0, borderline: 1, depression: 2) were included in the models as independent variables, and delivery method preference was the dependent variable and was coded as preference for vaginal delivery = 0 and preference for cesarean delivery = 1. In addition to the dependent and independent variables, variables such as age, education level, employment status, smoking status, the presence of chronic diseases, BMI, etc., which were found to be associated with cesarean section preference in the univariate analyses of the present study and shown to be associated with delivery method preference in the literature, were added to the created models as confounding factors. The descriptive power of the models was evaluated with Nagelkerke R2, and the compatibility was evaluated with the Hosmer–Lemeshow goodness-of-fit test. The significance level of the statistical tests was accepted as $p<0.05$.

Results

The mean age of the pregnant women was 27.53±4.96 years, 77.5% had a high school education or higher, and 27.3% were employed in any income-generating job. A total of 14.9% of pregnant women smoked. A total of 17.6% of pregnant women reported a diagnosis of chronic disease. The mean body mass index (BMI) of the pregnant women was 27.92±4.98 kg/m^2. A total of 70.3% of the pregnant women were in the 27–41st gestational week. The proportion of pregnant women who stated that it was their first pregnancy was 55.9%. A total of 19.1% of the pregnant women stated that they had previously experienced pregnancy loss. A total of 5.4% of the pregnant women reported that their current pregnancy was unintended. A total of 58.7% of the pregnant women stated that they received information about delivery methods from a physician. A total of 22.5% of the participants stated that cesarean section was their preferred delivery method. Among the pregnant women who preferred cesarean section, 68.1% stated that they preferred cesarean section because of fear of vaginal delivery, 13.2% wanted tubal ligation, 12.1% preferred cesarean section because of lack of information, and 58.7% received information about the mode of delivery from their physicians (Table 1).

Table 1. Descriptive characteristics of pregnant women (n=404).

Descriptive features	n (%)
Age (Mean ±SD: 27,53±4,96, min: 17, max: 43)	
17-34	372 (92.1)
≥35	32 (7.9)
Education level	
Secondary school and below	91 (22.5)
Highschool and above	313 (77.5)
Employment status	
Yes	111 (27.3)
No	293 (72.7)
Smoking status	
No	344 (85.1)
Yes	60 (14.9)
Chronic disease	
Absent	333 (82.4)
Available	71 (17.6)
BMI (Mean±SD: 27,92±4,98, min: 15,43, max: 50,92 kg/m^2)	
Underweight	3 (0.7)
Normal	130 (32.2)
Overweight	140 (34.7)
Obese	131 (32.4)
Gestational week (Mean±SD: 29,62±8,29, min:6, max:41)	
<12	37 (9.2)
13-26	83 (20.5)
27-41	284 (70.3)
Parity	
0	226 (55.9)
1	108 (26.7)
2	47 (11.6)
≥3	23 (5.8)
Previous pregnancy loss	
Absent	327 (80.9)
Available	77 (19.1)
Intended pregnancy	
Yes	382 (94.6)
No	22 (5.4)
Source of information about delivery method	
Physician	237 (58.7)
Midwife-nurse	56 (13.9)
Pregnancy school	28 (6.9)
Family	41 (10.1)
No information	42 (10.4)
Delivery method preference	
Preference for vaginal delivery	313 (77.5)
Preference for Cesarean delivery	91 (22.5)
Reasons for preference for cesarean delivery	
Fear of vaginal delivery	62 (68.1)
Desire for tubal ligation	12 (13.2)
Lack of information about delivery methods	11 (12.1)
Previous negative pregnancy experience	5 (5.5)
Aesthetic concerns	1 (1.1)

SD: standard deviation. Min: Minimum. Max: Maximum. BMI: Body mass index.

The mean scores of the HADS anxiety and depression subdimensions were 6.32±3.99 and 4.39±3.29,

respectively. According to the cut-off point of the scale, 14.9% of the pregnant women had anxiety symptoms, and 4.5% had depression symptoms (Table 2).

Table 2. Mean Hospital Anxiety and Depression Scale (HADS) scores of pregnant women.

HADS scores	n (%)	Mean ± SD	Range
Anxiety			
Normal	259 (64.1)	6.32±3.99	0-20.00
Borderline	85 (21.0)		
Anxiety	60 (14.9)		
Depression			
Normal	332 (82.1)	4.39±3.29	0-19.00
Borderline	54 (13.4)		
Depression	18 (4.5)		

SD: standard deviation.

Table 3 shows the delivery method preferences of pregnant women according to their descriptive characteristics. Pregnant women aged 35 years and above, smokers and those who had a previous pregnancy loss had a significantly greater preference for cesarean section as a delivery method ($p<0.05$). There was no statistically significant difference between the categories of education level, employment status, chronic disease, BMI, gestational week, number of births, desired pregnancy status and source of information about the mode of delivery in terms of the rate of preferring cesarean section as the delivery method ($p>0.05$). Among pregnant women with anxiety and depression symptoms, the rate of those who preferred cesarean section as the mode of delivery was significantly greater ($p<0.05$, Table 3).

Table 4 shows the associations of anxiety and depression with CS preference according to multivariate logistic regression analysis. The probability of preferring cesarean section as the delivery method was 2.80 times greater for pregnant women with anxiety symptoms than for normal pregnant women (95% CI: 1.53-5.15) and was 3.68 times (95% CI: 1.41-9.61) greater for pregnant women with symptoms of depression (Table 4, Model 1). After adjustment for age and education level, the probability of preferring cesarean section as the delivery method was 2.72 times (95% CI: 1.44-5.16) greater in pregnant women with anxiety symptoms and 3.06 times (95% CI: 1.13-8.33) greater in those with depression symptoms than in normal pregnant women (Table 4, Model 2). In addition to age and education level, after adjustment for employment status, gestational week, number of deliveries and history of pregnancy loss, the preference for cesarean delivery was 2.78 times (95% CI: 1.46-5.30) greater in pregnant women with anxiety symptoms and 3.31 times (95% CI: 1.18-9.33) greater in those with depression symptoms than in normal pregnant women (Table 4, Model 3).

Table 3. Pregnant women's delivery method preferences according to descriptive characteristics (n=404).

Descriptive features	Preference for cesarean delivery (n=91)	Preference for Vaginal delivery (n=313)	p*
	n (%)	n (%)	
Age			
17-34	78 (21.0)	294 (79.0)	**0.011**
≥35	13 (40.6)	19 (59.4)	
Education level			
Secondary school and below	26 (28.6)	65 (71.4)	0.117
Highschool and above	65 (20.8)	248 (79.2)	
Employment status			
Yes	24 (21.8)	86 (78.2)	0.879
No	66 (22.5)	227 (77.5)	
Smoking status			
No	68 (19.8)	276 (80.2)	**0.001**
Yes	23 (38.3)	37 (61.7)	
Chronic disease			
Absent	72 (21.6)	261 (78.4)	0.347
Available	19 (26.8)	52 (73.2)	
BMI			
Underweight/normal	32 (24.1)	101 (75.9)	0.605
Overweight/obese	59 (21.8)	212 (78.2)	
Gestational week			
<12	11 (29.7)	26 (70.3)	0.258
13-26	14 (16.9)	69 (83.1)	
27-41	66 (23.2)	218 (76.8)	
Parity			
0	51 (22.6)	175 (77.4)	0.982
1 and above	40 (22.5)	138 (77.5)	
Previous pregnancy loss			
Absent	67 (20.5)	260 (79.5)	**0.044**
Available	24 (31.2)	53 (68.8)	
Intended pregnancy			
Yes	83 (21.7)	299 (78.3)	0.110
No	8 (36.4)	14 (63.6)	
Source of information about delivery method			
Physician	53 (22.4)	184 (77.6)	0.664
Midwife-nurse	15 (26.8)	41 (73.2)	
Pregnancy school	6 (21.4)	22 (78.6)	
Family	6 (14.6)	35 (85.4)	
No information	11 (26.2)	31 (73.8)	
Anxiety			
Normal	47 (18.1)	212 (81.9)	**0.003**
Borderline	21 (24.7)	64 (75.3)	
Anxiety	23 (38.3)	37 (61.7)	
Depression			
Normal	71 (21.4)	261 (78.6)	**0.017**
Borderline	11 (20.4)	43 (79.6)	
Depression	9 (50.0)	9 (50.0)	

*Pearson chi-square test. BMI: body mass index.

In addition to the variables in Model 3, after we adjusted for smoking status, chronic disease status, BMI, and intended pregnancy status, 2.47 times (95% CI: 1.27-4.78) higher odds in pregnant women with anxiety symptoms and 3.25 times (95% CI: 1.14-9.25) higher odds in pregnant women with depression symptoms than in normal pregnant women (Table 4, Model 4).

Table 4. Associations of anxiety and depression symptoms with preference for cesarean delivery according to multivariable logistic regression analysis.

Variables	Model 1 (Crude model)		Model 2 (Adjusted model)		Model 3 (Adjusted model)		Model 4 (Adjusted model)	
	UOR (%95CI)	p	AOR (%95CI)	p	AOR (%95CI)	p	AOR (%95CI)	p
Anxiety								
Normal	1.00	Ref.	1.00	Ref.	1.00	Ref.	1.00	Ref.
Borderline	1.48 (0.82;2.66)	0.189	1.46 (0.81;2.63)	0.211	1.54 (0.84;2.79)	0.161	1.49 (0.81;2.76)	0.194
Anxiety	2.80 (1.53;5.15)	**0.001**	2.72 (1.44;5.16)	**0.002**	2.78 (1.46;5.30)	**0.002**	2.47 (1.27;4.78)	**0.008**
Depression								
Normal	1.00	Ref.	1.00	Ref.	1.00	Ref.	1.00	Ref.
Borderline	0.94 (0.46;1.92)	0.866	0.92 (0.45;1.89)	0.829	0.99 (0.48;2.06)	0.993	0.97 (0.47;2.01)	0.932
Depression	3.68 (1.41;9.61)	**0.008**	3.06 (1.13;8.33)	**0.028**	3.31 (1.18;9.33)	**0.024**	3.25 (1.14;9.25)	**0.027**

UOR: Unadjusted odds ratio, AOR: Adjusted odds ratio, CI: Confidence interval.
Model 1. Crude model.
Model 2. Adjusted for age (Continuous), education level (High school and above: 0, Secondary school and below: 1).
Model 3. Adjusted for age (Continuous), education level (High school and above:0, Secondary school and below:1), employment status (Yes:0, No:1), gestational week (Continuous), parity (Continuous), and history of pregnancy loss (No:0, Yes:1).
Model 4. Adjusted for age (continuous), education level (high school and above:0, secondary school and below:1), employment status (yes:0, no:1), gestational week (continuous), parity (continuous), history of pregnancy loss (no:0, yes:1), smoking status (no:0, yes:1), chronic disease status (no:0, yes:1), body mass index (BMI-continuous), and desired pregnancy status (yes:0, no:1).

Discussion

According to OECD data, the cesarean section rate in Türkiye was 5.7% in 1988, 7% in 1993, 14% in 1998, 31.7% in 2006, 47.2% in 2010, 51% in 2014, and 58.4% in 2021.[13] These rates are clearly far from the 10–15% cesarean section rates recommended by the World Health Organization.[14] In a recent study, the primary reason for this increase in cesarean section rates was that pregnant women who had a cesarean section in their previous pregnancy also had their next delivery via cesarean section.[15] However, in our study, even after pregnant women who had a previous cesarean section were excluded, the rate of preference for cesarean delivery without medical or obstetric indications was 22.5%. In a study conducted in China, the rate of cesarean sections due to maternal request was found to be 42.7%.[16] These findings indicate that maternal preference remains an important factor in cesarean delivery without medical or obstetric indications. Our study, in which we also questioned the reasons for preference for cesarean delivery without medical or obstetric indications, revealed that fear of vaginal delivery was the leading reason for this request, with a high rate of 68.1% among pregnant women who preferred cesarean delivery without any medical or obstetric indications. The other reasons were as follows: request for tubal ligation (13.2%), misinformation or lack of information about the delivery methods (12%), negative birth experiences in previous deliveries (5.5%) and postpartum aesthetic concerns of the woman (1.1%). Similarly, in a study published in Brazil, fear of vaginal delivery ranked first among the reasons for cesarean delivery on maternal preference.[17]

According to the data obtained via face–to-face interviews with 404 pregnant women in our study, 22.5% of pregnant women preferred cesarean delivery without medical or obstetric indications. Considering that the pregnant women we followed know that cesarean section is not performed in our hospital unless there is a medical indication, we believe that the actual rate in our region is much higher than this. In our study, we compared pregnant women who preferred cesarean delivery without medical indications with those who requested vaginal delivery to determine what underlies mothers' preferences for cesarean section.

In our study, pregnant women with a history of loss to previous pregnancies had a significant increase in the preference for cesarean delivery (Table 3). In a Tehran-based study, similar results were reported, and a history of miscarriage in previous pregnancies increased the demand for cesarean delivery.[18] Another study reported that pregnant women believed that cesarean section was safer and more controllable for the fetus.[19] These studies may explain the preference for cesarean delivery among pregnant women with a history of pregnancy loss. However, contrary to the general opinion, in a China-based study in which 24.7% of mothers underwent a cesarean section, there was no significant difference in the frequency of maternal intensive care unit admission, organ injuries, maternal infection, postpartum hemorrhage or thromboembolic complications between the groups with a cesarean section at the time of

maternal request and those with planned vaginal delivery.[20] This study suggests that the perceptions of maternal and fetal safety in cesarean delivery are not accurate.

In our study, a statistically significant relationship was found between smoking and the preference for cesarean delivery (Table 3). In previous studies, this positive association was reported to be an attempt by the pregnant woman to overcome her concerns about fetal health due to smoking by preferring cesarean delivery, which they considered safer.[21] We believe that cessation of smoking not only during pregnancy but also from the time of preconception will reduce fetal health concerns and the preference for cesarean delivery.[22]

Our findings suggest that advanced maternal age is another factor influencing the preference for cesarean delivery without medical or obstetric indications. Among pregnant women 35 years of age and older, preference for cesarean delivery without medical or obstetric indications was significantly greater than that among pregnant women under 35 years of age. We believe that the increased feto-maternal risk associated with advanced maternal age and the attempt to eliminate the perception that cesarean delivery is less risky lead to this high rate. In a review, similar results were obtained, and it was found that as maternal age increases, the number of cesarean sections due to maternal requests increases.[19] Although older pregnant women consider cesarean delivery safer, many studies have shown that maternal complications are more common in elective cesarean sections performed at advanced maternal ages.[23] Therefore, we believe that informing older pregnant women properly before delivery and questioning their perceptions of risk and safety will reduce their requests for cesarean section.

Mental health disorders, including stress, anxiety and depression, are the most common complications of pregnancy. They affect up to 15% of women in the antenatal period and in the first year postpartum.[24] Common causes of anxiety include hormonal changes associated with mood swings, financial problems, coping with the discomfort of pregnancy, worries about caring for the baby, uncertainty about the birth process, problems with one's partner or family, and medical complications during pregnancy.[25–27]

Symptoms of anxiety and depression during pregnancy are not routinely screened for but are actually quite common.[28] In our study, we evaluated the anxiety and depression scores of pregnant women with HADS scores with the hypothesis that the psychological condition of the pregnant woman may also be important in the choice of delivery method. We found that 14.9% of the pregnant women had anxiety symptoms and that 4.5% had depression symptoms.

In our study, among the women who preferred cesarean delivery without medical indications, the rates of symptoms of anxiety and depression were higher (Table 3).

We observed that the number of preference for cesarean delivery without medical or obstetric indications was 2.8 times greater in pregnant women with anxiety symptoms than in those without anxiety symptoms and 3.68 times greater in pregnant women with depression symptoms than in those without depression symptoms according to the HADS (Table 4, Model 1). In addition to anxiety and depression symptoms, age, education level, employment status, gestational week, parity, history of pregnancy loss, smoking, chronic disease, and BMI, after adjusting for confounding variables such as desired pregnancy, we found that the rates of off-indication cesarean delivery were 2.72 times greater in Model 2, 2.78 times greater in Model 3 and 2.47 times greater in Model 4 for pregnant women with anxiety symptoms, and 3.06 times greater in Model 2, 3.31 times greater in Model 3 and 3.25 times greater in Model 4 for pregnant women with depression symptoms (Table 4, Model 2-3-4). These models suggest that anxiety and depression symptoms are independently associated with a higher likelihood of preferring cesarean delivery, even in the absence of medical or obstetric indications. A similar result was observed in the study by Andersson et al., who reported that elective cesarean delivery was performed more frequently in pregnant women with anxiety and/or depression symptoms.[29] Thus, we believe that psychological evaluation during pregnancy should be routinely performed to ensure that pregnant women have a healthy pregnancy period and that providing psychological support to pregnant women with anxiety or depression findings may reduce the number of requests for cesarean delivery without indications. In a study conducted by Sydsjö et al.[30] women diagnosed with psychiatric disorders within 5 years before pregnancy were 2.5 times more likely to request cesarean delivery in their pregnancies than normal pregnant women were. For this reason, screening the psychiatric history of all women planning pregnancy at pregestational visits, if possible, may be important for early psychological support in the follow-up of pregnancies in such patients. In addition, since pregnant women with cesarean section without indications are more likely to have anxiety and depression symptoms after delivery, care should be taken in terms of postpartum depression during the postpartum follow-up period.[31]

In contrast to some studies in the literature, in our study, no statistically significant difference was found between the preference for cesarean delivery and educational level, employment status, chronic diseases, BMI, gestational week, number of deliveries, duration of conception and desired pregnancy status. These variables did not increase the number of requests for cesarean delivery. However, in the meta-analysis of Jenabi et al.[19] statistically significant differences were found between the number of births, occupation, education, maternal obesity and number of living children and the preference for cesarean section. This difference can be explained by the fact that pregnant women know that cesarean section is not performed in our hospital with the indication of a maternal request and that this patient portfolio is frequently followed up in

private health centers where these requests can be welcomed.

An extensive meta-analysis also revealed strong evidence that providing childbirth education to women during pregnancy decreases the need for cesarean section and increases the rate of vaginal delivery.[32] Contrary to expectations, in our study, there was no significant relationship between the information received by pregnant women about delivery (doctor, midwife, pregnancy school, family) and the choice of delivery method. ($p>0.05$). The findings in our study conflict with the results in the literature. This contradiction suggests that pregnancy education in our hospital may not be efficient enough and may lead to deficiencies in the education of pregnant women.

To reduce cesarean delivery rates to the rates recommended by the WHO, the most rational ways to increase vaginal delivery without increasing maternal and fetal mortality and morbidity should be determined, the reasons for the maternal preference for cesarean delivery and fear of vaginal delivery should be identified, necessary medical precautions should be taken, and psychological support should be provided.

Limitations of the study

The main limitation of this study is its cross-sectional design, which does not allow temporal or causal relationships to be established between anxiety/depression symptoms and cesarean delivery preference. Therefore, the findings should be interpreted as associations rather than determinants of delivery preference. Other limitations include the single-center design, which limits the generalizability of the findings, and the collection of data based on participants' self-reports, which may have introduced reporting bias. In addition, cesarean section without medical or obstetric indications is not routinely performed in our hospital. Therefore, pregnant women who prefer cesarean delivery on maternal request may have been more likely to seek follow-up at other centers where this request could be accommodated. Consequently, the rate of elective cesarean section preference among pregnant women in our region may be higher than that observed in our sample.

In conclusion, in this cross-sectional study, anxiety and depression symptoms were independently associated with a higher likelihood of preferring cesarean delivery among pregnant women without medical or obstetric indications for cesarean section. These findings emphasize that in addition to physiological factors, psychological factors play an important role in delivery preferences. In this context, women's mental health status should be screened and monitored regularly during pregnancy, early interventions should be planned by a multidisciplinary team for pregnant women with symptoms of anxiety or depression, mental health problems such as anxiety and depression should be recognized in pregnancy schools, and training should be planned for coping skills.

Conflict of Interest

All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. The authors indicate no financial support or financial conflict of interest. The authors have indicated they have no financial relationships with any company and no external funding.

Ethics committee approval

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and approval was obtained from Bandırma Onyedi Eylül University Health Sciences Non-Interventional Research Ethics Committee. (19.02.2024/2023-16). Within the scope of the study, the participants were informed about the purpose and scope of the study, and the women who agreed to participate in the study and who decided to be included in the study according to the inclusion and exclusion criteria were asked to sign the informed consent form.

Author Contributions

AT, RD, YB, Surgical and medical practices; AT, NŞ, YB, Concept; AT, NŞ, GEA, YB, Design; AT, RD, NŞ, GEA, EG, YB, Data Collection or Processing; AT, GEA, EG, YB, Analysis or İnterpretation; AT, RD, EG, YB, Literature Search; AT, RD, YB, Writing.

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