ISSN 2458-8865 E-ISSN 2459-1505
www.fppc.com.tr
Family Practice & Palliative Care

Research Article

The relationship between pregnancy-related anxiety, trait anxiety, and internet use in pregnant women: a cross-sectional study

Gebe kadınlarda gebelikle ilgili kaygı, sürekli kaygı ve internet kullanımı arasındaki ilişki: kesitsel bir çalışma

Yusuf Bilal Çelenk[a], Burkay Yakar[a]

[a] Department of Family Medicine, School of Medicine, Firat University, Elazig, Türkiye

Abstract

Introduction: Pregnancy-related anxiety leads to some negative maternal and fetal complications. Determining prenatal and natal anxiety and associated factors can help identify high-risk women who need intervention during pregnancy and develop early intervention strategies. The aim of this study is to determine pregnancy-related, and trait anxiety in the prenatal period and its affecting factors.

Methods: This cross-sectional and descriptive study was conducted with 245 pregnant women in the obstetrics clinic of a tertiary healthcare institution between March and August 2022. The sociodemographic, obstetric, and internet use of the participants were questioned. Pregnancy-related anxiety was assessed by using Pregnancy-Related Anxiety Questionnaire-Revised-2 (PRAQ-R2), and trait anxiety was assessed by using State–Trait Anxiety Inventory-I (STAI-II).

Results: Pregnant women's mean scale score for STAI (trait) was 45.54 ± 6.32, for PRAQ-R2 total score was 27.80 ± 8.32, for PRAQ- Fear of giving birth score was 10.12 ± 3.92, PRAQ- Worries about bearing a physically or mentally handicapped child score was 10.44 ± 4.11, and PRAQ- Concern about own appearance score was 7.24 ± 2.86. Pregnancy-related Anxiety Scale score was higher in nulliparous than multiparous (p=0.002) and 30-35 age groups than others (p=0.014). Having a chronic disease is related to a higher anxiety score (p=0.028). Trait anxiety scores were higher in nulliparous (p=0.005), those with low income, those with chronic diseases (p=0.032), and those with a history of children with congenital diseases (p=0.013). Anxiety scores were higher in pregnant women who used the internet as a source of information about pregnancy (p=0.002), and those who use the internet more (p=0.023). There was a significant positive correlation between STAI (trait) anxiety and PRAQ total score (r:0.292, p<0.001), PRAQ- Fear of giving birth (r:0.145, p=0.024), PRAQ- Worries about bearing a physically or mentally handicapped child (r:0.270, p<0.001), and PRAQ- Concern about own appearance (r:0.254, p=<0.001).

Conclusion: Pregnancy-related anxiety was higher in nulliparous, 30-35 age groups, having a chronic disease, husbands' high education status, and having trait anxiety. Information obtained from the internet and the time spent on the internet are associated with increased pregnancy anxiety. Future studies should focus more on predicting factors affecting pregnancy-related anxiety and estimating risks for pregnant women.

Keywords: Pregnancy, Anxiety, Fear, Internet Usage

Öz

Giriş: Gebelik ile ilişkili kaygı, bazı olumsuz maternal ve fetal komplikasyonlara yol açar. Doğum öncesi ve gebelik dönemindeki kaygı ve ilişkili faktörlerin belirlenmesi, gebelik sırasında müdahaleye ihtiyaç duyan yüksek riskli kadınların belirlenmesine ve erken müdahale stratejilerinin geliştirilmesine yardımcı olabilir. Bu çalışmanın amacı, gebeliğe bağlı ve doğum öncesi dönemde sürekli kaygıyı ve etkileyen faktörleri belirlemektir.

Yöntem: Kesitsel ve tanımlayıcı tipte olan bu çalışma Mart-Ağustos 2022 tarihlerinde 3. basamak bir sağlık kuruluşunun obstetri kliniğinde 245 gebe ile yürütülmüştür. Katılımcıların sosyodemografik, obstetrik ve internet kullanım özellikleri sorgulanmıştır. Gebeliğe bağlı kaygı, Gebelikle İlgili Anksiyete Anketi-Gözden Geçirilmiş-2 (PRAQ-R2) ölçeği, sürekli kaygı ise Durumluk Sürekli Kaygı Envanteri-I (STAI-II) kullanılarak değerlendirildi.

Bulgular: Gebelerin STAI-II (sürekli) ölçek puanı 45,54 ± 6,32, PRAQ-R2 toplam puanı 27,80 ± 8,32, PRAQ- Doğum yapma korkusu puanı 10,12 ± 3,92, PRAQ-Bedensel veya zihinsel engelli çocuk doğurma endişesi puanı 10,44 ± 4,11 ve PRAQ- Kendi görünüşüne ilişkin endişe puanı 7,24 ± 2,86 idi. Gebeliğe İlişkin Kaygı Ölçeği puanı hiç doğum yapmamışlarda (p=0,002), 30-35 yaş aralığında (p=0.014) ve kronik hastalığı olanlarda (p=0,028) daha yüksekti. Hiç doğum yapmamış (p=0,005), gelir düzeyi düşük olanlarda, kronik hastalığı olanlarda (p=0,032) ve doğuştan hastalık öyküsü olanlarda (p=0,013) sürekli kaygı puanları daha yüksekti. Gebelikle ilgili bilgi kaynağı olarak interneti kullanan gebelerde (p=0,002) ve interneti daha fazla kullanan gebelerde (p=0,023) anksiyete puanları daha yüksekti. STAI-II (sürekli) kaygı ile PRAQ toplam puanı (r:0.292, p<0.001), PRAQ- Doğum yapma korkusu (r:0.145, p=0.024), fiziksel ve zihinsel engelli çocuk doğurma korkusu (r:0.270, p<0.001) ve PRAQ- Kendi görünüşüne İlişkin kaygı (r:0.254, p=<0.001) arasında pozitif anlamlı korelasyon vardı.

Sonuç: Gebeliğe bağlı kaygı; doğum yapmamış olanlarda, 30-35 yaş grubunda, kronik hastalığı olanlarda, eşinin eğitim durumu yüksek olanlarda ve sürekli kaygısı olanlarda daha yüksekti. İnternetten edinilen bilgiler ve internette geçirilen süre artan gebelik kaygısı ile ilişkilidir. Gelecekteki çalışmalar, hamilelikle ilgili kaygıyı etkileyen faktörleri tahmin etmeye ve hamile kadınlar için riskleri tahmin etmeye daha fazla odaklanmalıdır.

Anahtar kelimeler: Gebelik, Kaygı, Korku, İnternet kullanımı

Received	Accepted	Published Online	Corresponding Author	E-mail
April 2, 2023	March 13, 2024	July 31, 2024	Yusuf Bilal Celenk	ybcelenk@gmail.com
Correspondence	Dr.Yusuf Bilal Çelenk. Cumhuriyet mah. Vedat Dolakay cad. İktisat sk. No:19 Kat:3 Daire:4 Merkez/Elazığ, Türkiye			
	https://doi.org/10.22391/fppc.1270790			

Key Points

1. Pregnancy related anxiety was higher in nulliparous women, those with chronic diseases, and women between the ages of 30-35 years.
2. Pregnancy related anxiety was higher in women who used the internet as a source of pregnancy-related information.
3. The information obtained from the internet and the increase in time spent on the internet caused an increase in pregnancy-related anxiety.
4. Women with high trait anxiety scale scores also had high levels of pregnancy-related anxiety.

Introduction

Pregnancy is a period in which women experience emotional difficulties due to physiological, psychological and hormonal changes and an increase in the risk of psychiatric morbidity. Psychological distress during pregnancy is generally defined as depression or anxiety. Some women may experience pregnancy positively as a source of happiness, contentment, and self-affirmation, while others may experience psychological health problems during this period, such as the development of anxiety [1].

Anxiety is an important psychological problem during pregnancy. Pregnancy is a time when the likelihood of anxiety increases. Pregnancy anxiety is associated with preterm birth, preeclampsia, low birth weight (LBW) infants, small for gestational age (SGA) children, adverse mental and developmental outcomes [2]. Pregnancy related anxiety is also associated with increased hypertension and increased cesarean section risk. Pregnancy anxiety is more associated with negative pregnancy outcomes than general anxiety [3,4]. Many studies have shown that anxiety is associated with negative pregnancy outcomes [5]. Stress caused by pregnancy related anxiety is the main factor underlying negative outcomes. Stress causes negative outcomes by increasing the release of corticotrophin-releasing hormone (CRH) and causing inflammatory process irregularity in pregnant women [6,7]. It is obvious that the way to prevent these negative outcomes is to reduce anxiety in pregnancy. Therefore, detection and screening of factors associated with pregnancy related anxiety can reduce stress. It is known from previous literature data that culture, socioeconomic status, education, previous pregnancy experiences and level of knowledge can affect anxiety. Recent meta-analysis studies have reported that abnormal pregnancy-labor history, poor health status, pregnancy complications, and unplanned pregnancies, low education level, living with extended family members, family history of psychiatric disorders, hyperemesis gravidarum, comorbid sleep disorders are risk factors for anxiety [8,9]. Also, receiving antenatal care can affect depression symptoms and anxiety. Apart from the risks to the patient, our inadequate care can also have negative consequences.

Another factor associated with pregnancy-related anxiety may be internet use. Pregnancy is a period when people need more health information and seek information. It has been reported that pregnant women seek a second opinion and information on the internet in order to combat the increasing anxiety during pregnancy [10]. There is insufficient data on how obtaining information via the internet will affect pregnancy-related anxiety. Previous literature data reported that people with high anxiety levels seek more online information, and false information obtained online further increases their anxiety levels [11]. The pregnancy period is associated with increased anxiety, and therefore it may be that pregnant women need more information online. Considering previous data, internet use may be a predictor of pregnancy anxiety. For this reason, there is a need for studies investigating the relationship between internet use and anxiety during pregnancy. The current study aimed to examine pregnancy related anxiety and related factors. In addition, it is aimed to examine the effect of the information source accessed via the internet, as access to health advice and information has increased through the internet and social media.

Methods

Study design and population

The cross-sectional and descriptive study conducted between March-August 2022 in tertiary hospital. The study population consisted of all pregnant women over the age of 18 years old who applied to the pregnant follow-up outpatient clinic. The sample size was calculated with the formula $n=t^2pq/d^2$. The sample size was calculated as 240 individuals, with a prevalence of 20%, a reliability of 95% (with an error of a=0.05) and (d=0.05) reported in previous studies [12]. A total of 244 pregnant women were included in the study by random sampling method.

Inclusion criteria: Turkish pregnant women over the age of 18 years old who were administered antenatal follow-up clinic and willing to participate in the study. Exclusion criteria of the study; known anxiety disorder, anxiolytic and antidepressant drug use, ectopic pregnancy, infertility treatment and substance addiction. The study protocol was approved by Firat University's non-interventional research ethics committee (date: 24.02.2022 no:2022/03-16). All participants were informed about the study protocol and written informed consent was obtained from all the participants.

Variables

Independent variables were obtained by sociodemographic questionnaire form. Independent variables included age, education level, occupation, household income (Income was classified according to minimum wage. Those with income below the minimum wage = below the minimum wage; those with minimum wage and slightly above = minimum wage; those with 2 times the minimum wage and above = Above the minimum wage), disease history, previous pregnancy experiences, current obstetric characteristics, pregnancy information resource, and husband's history of education, occupation, illness, and substance abuse. The dependent variables of the study were trait anxiety and pregnancy-related anxiety situation.

Measurements

Anxiety during pregnancy was measured by the Turkish version of the Pregnancy-Related Anxiety Questionnaire-Revised 2 (PRAQR2), it was developed by Derya et al. and has Turkish validity and reliability. The scale is a 5-point Likert scale designed to determine the level of anxiety experienced by women about their pregnancy. The scale was designed to determine the level of anxiety experienced by women about their pregnancy in all pregnancy types, regardless of parity. The scale is structured with 11 items and 3 dimensions. Fear of giving birth (items 1, 2, 6, and 8), Worries about bearing a physically or intellectually disabled child (items 4, 9, 10, and 11), and Concern about own appearance (items 3, 5, and 7) are the subdimensions. The eighth item of the questionnaire ("I am worried about childbirth because I have never experienced it before") applies to women who have never given birth, not to multiparous women. Items are rated from 1 to 5 (1 = "strongly disagree" and 5 = "strongly

agree"). The minimum and maximum total scores are 11 and 55 for the primiparous group, and 10 and 50 for the multiparous group, respectively. The higher the score obtained from the scale, the higher the anxiety level during pregnancy. All statements in the questionnaire are structurally positive, and the questionnaire has no breakpoints. The Cronbach's alpha reliability coefficient of the questionnaire varies between 0.71 and 0.85 for the multiparous group and between 0.75-0.84 for the primiparous group, based on the values measured at different weeks of gestation [13].

State and trait anxiety of pregnant women were measured by the Turkish version of the State-Trait Anxiety Inventory, it was developed by Oner et al. and has Turkish validity and reliability. The scale has 2 dimensions measuring STAI-State (STAI-S) and STAI-Trait (STAI-T) anxiety levels. It consists of 20 questions in both sub-dimensions. The STAI-Trait (STAI-T) sub-dimension was used in the current study. The STAI-T sub-dimension contains 20 questions in a 4-point (not at all=1 to very much so=4) Likert style. The total score ranges from a minimum of 20 to a maximum of 80 points. The high score indicates high levels of trait anxiety [14].

Statistical analysis

The IBM SPSS version 25.0 package application was used to statistically analyze the study's data. Descriptive statistics for the quantitative data were presented as mean ± standard deviation or median (min-max) and categorical variables were presented as frequency (n) and percentage (%). The Shapiro-Wilk test was used to assess how closely quantitative variables adhered to the normal distribution. Student t-test was used to compare two independent groups for normally distributed quantitative data. The mean difference between more than two independent groups was analyzed with the Kruskal Wallis H test followed by the post-Hoc Dunn-Bonferroni test, and the descriptive statistics were provided as Median (Min–Max) for non-normally distributed quantitative data. The Anova test followed by the post-Hoc Dunn-Bonferroni test was used to compare more than two independent groups in normally distributed quantitative data, and the data were shown as mean ± sd. The correlation between scale scores was tested with Spearman correlation analysis. The significance threshold of 0.05 was approved.

Results

A total of 244 pregnant women with a median age of 28 were included. The baseline characteristics of the participants are presented in Table 1.

Table 1. Baseline characteristics of participants

Features	Median	Min-max
Age	28.0	18.0-43.0
Number of living children	1.0	0.0-4.0
Abortus	0.0	0.0-5.0
Interventional birth history	0.0	0.0-3.0
Gestational weeks	25.5	6.0-40.0
Age groups	**n**	**%**
18-25 years	52	21.3
26-30 years	96	39.4
31-35 years	71	29.1
≥35 years	25	10.2
Parity		
Nulliparous	162	66.4
Multiparous	82	33.6
Educational status		
Illiterate	2	0.8
Elementary school	26	10.7
Secondary school	37	15.2
High school	55	22.5
University and higher	124	50.8
Occupation		
Housewife	177	72.5
Official	43	17.6
Private sector employee	19	7.8
Minimum wage worker	5	2.0
Household income		
< 5000 Turkish Lira (Low)	69	28.3
5000-10000 Turkish Lira (Moderate)	110	45.1
≥ 10000 Turkish Lira (High)	65	26.6
Sex of the fetus		
Girl	94	38.5
Boy	95	38.9
Unknown	55	22.5
Smoking status		
Yes	22	9.0
No	222	91.0
Chronic illness status		
Yes	51	20.9
No	193	79.1
Lifetime history of psychiatric illness		
Yes	6	2.5
No	238	97.5
Having a child with congenital illness		
Yes	6	2.5
No	238	97.5
Participating in pregnancy education		
Yes	30	12.3
No	214	87.7

The rate of cigarettes or alcohol use in the husbands of pregnant women was 40.2%. The rate of having chronic disease was 5.7%. Husbands' characteristics showed in Table 2.

Table 2. Sociodemographic characteristics of the husband

Features	n	%
Husband Educational status		
Illiterate	2	0.8
Elementary school	16	6.6
Secondary school	30	12.3
High school	73	29.9
University and higher	123	50.4
Husband Occupation		
Official	78	32.0
Private sector employee	79	32.4
Artisan	33	13.5
Minimum wage worker	36	14.8
Unemployed	18	7.4
Husband Chronic illness status		
Yes	14	5.7
No	230	94.3
Cigarettes or alcohol use history		
Yes	98	40.2
No	146	59.8

Pregnancy information resources and internet usage characteristics of the participants are presented in Figure 1. Fifty percent (n=122) of the participants stated that medical experts were their main sources of information on pregnancy. Secondly, the most common source of information about pregnancy was the internet (%36, n=87). 58% of pregnant women were using the internet to obtain information. In addition, 27% of the pregnant women reported that they searched for information on the internet every day, and 34% of them 3-4 days a week (Figure 1).

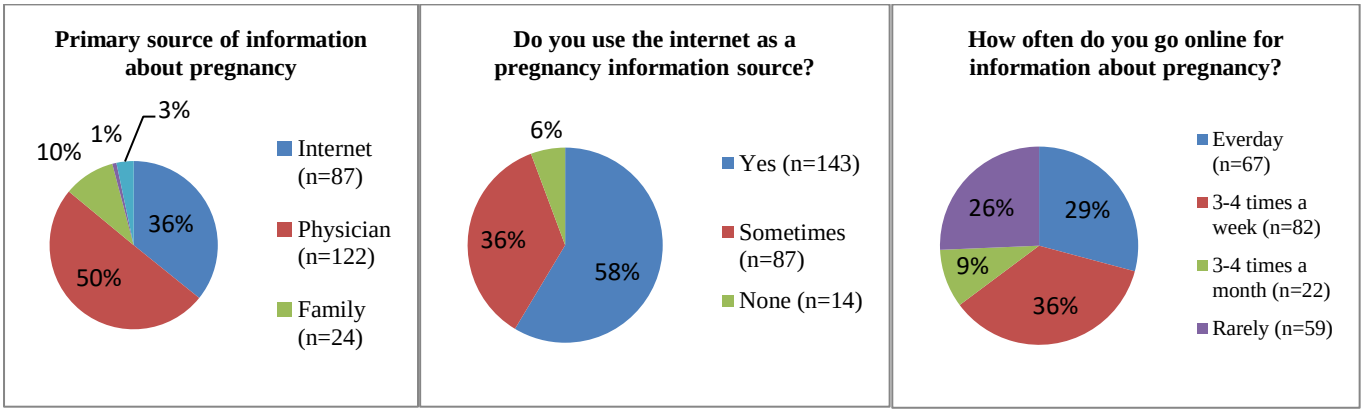

Figure 1. Pregnancy information source and characteristics of the participants

Pregnant women's mean scale score for STAI (trait) was 45.54 ± 6.32, for PRAQ-R2 total score was 27.80 ± 8.32, for PRAQ- Fear of giving birth score was 10.12 ± 3.92, PRAQ- Worries about bearing a physically or mentally Handicapped Child score was 10.44 ± 4.11, and PRAQ- Concern about Own Appearance score was 7.24 ± 2.86. Pregnancy-related Anxiety Scale score was higher in nulliparous than in multipart *(p=0.002)*. Having a chronic disease is related to a higher anxiety score *(p=0.028)*. Trait anxiety scores were higher in nulliparous *(p=0.005)*, those with low income, those with chronic diseases *(p=0.032)*, and those with a history of children with congenital diseases *(p=0.013*, Table 3).

Table 3. Comparison of some characteristics and PRAQ-R2 and STAI (trait) scales scores of pregnant women

Variables	PRAQ-R2 score	p	p*	STAI score	p	p*
Age group						
18-25 year[1]	28.44±9.71		1-2:>0.999	45.81±6.29		
25-30 year[2]	28.91±7.98		1-3:0.177	45.49±6.49	0.945[a]	
30-35 year[3]	25.17±7.59	***0.014[a]***	1-4:>0.999	45.25±6.41		
35 years and above[4]	29.72±7.04		***2-3:0.023*** 2-4:>0.999 3-4:0.106	46.00±5.70		
Pregnancy						
Nullipara and primipara	28.99±8.36	***0.002[b]***		44.74±5.98	***0.005[b]***	
Multipara	25.46±7.77			47.12±6.69		
Education level						
Primary	26.48±8.26			46.26±5.64		
High school	26.91±7.99	0.109[a]		45.96±7.61	0.354[a]	
University	28.90±8.40			44.98±6.01		
Occupation						
Housewife	27.80±8.69			45.97±6.52		
Official	28.88±7.06	0.377[a]		44.98±5.85	0.136[a]	
Others	25.92±7.47			43.38±5.13		
Household income						
Below minimum wage[1]	26.97±8.52			47.22±6.55		1-2: ***0.038***
Minimum wage[2]	28.59±8.74	0.395[a]		44.98±6.08	***0.032[a]***	1-3: ***0.014***
Above minimum wage[3]	27.25±7.33			44.71±6.21		2-3: 0.487
Smoke						
Yes	26.73±8.63	0.526[b]		46.41±7.08	0.500[b]	
No	27.91±8.29			45.45±6.24		
Having chronic disease						
Yes	30.08±8.79	***0.028[b]***		47.49±6.55	***0.013[b]***	
No	27.20±7.11			45.03±6.17		
History of psychiatric illness						
Yes	27.70±8.33	0.230[b]		45.49±6.22	0.405[b]	
No	31.83±7.22			47.67±9.97		
Having a child with congenital illness						
Yes	27.66±8.34	0.099[b]		45.33±6.18	***0.001[b]***	
No	33.33±5.12			53.83±6.49		
Participating in pregnancy education						
Yes	27.85±8.57	0.813[b]		45.64±6.17	0.513[b]	
No	27.47±6.33			44.83±7.36		

[a] Anova test; [b] Student t-test

High education level of husband is associated with higher pregnancy related anxiety score (p=0.025). No statistically significant relationship was found between Husband Chronic illness status and History of drug use of husband and anxiety scores of pregnant women (Table 4).

Table 4. Comparison of some characteristics of husband and PRAQ-R2 and STAI (trait) scales scores of pregnant women

Variables	PRAQ-R2 score	p	p*	STAI score	p
Education level					
Primary	25.17±7.77		1-2: ***0.016***	45.38±6.71	
High school	28.64±9.28	***0.025[a]***	1-3: ***0.012***	46.16±6.76	0.516[a]
University	28.33±7.76		2-3: 0.927	45.24±5.90	
Husband Chronic illness status					
Yes	27.97±8.44	0.218[b]		45.54±6.37	0.985[b]
No	25.14±5.57			45.57±5.52	
History of drug use					
Yes	27.77±8.10	0.947[b]		44.93±5.89	0.066[b]
No	27.85±8.67			46.45±6.84	

[a] Anova test; [b] Student t-test

Anxiety scores were higher in pregnant women who used the internet as a source of information about pregnancy *(p=0.002).* There was a significant relationship between the frequency of Internet use and pregnancy-related anxiety *(p=0.023).* Pregnancy-related anxiety scores were low in those who rarely or never used the Internet. (Table 5)

Table 5. Comparison of internet use and information source of participants and PRAQ-R2 and STAI (trait) scales scores

Variables	PRAQ-R2 score	p	p*	STAI score	p
Do you use the internet as a pregnancy information source					
Yes[1]	29.26±8.91		1-2: ***0.017***	45.67±6.17	
Sometimes[2]	26.17±7.05	***0.002***[a]	1-3: ***0.021***	45.60±6.18	0.362[a]
No[3]	23.07±5.69		2-3: 0.561	43.21±8.46	
How often do you use the internet as a source of information?					
Every day[1]	28.0 (10.0-51.0)		1-2:0.405	46.0 (31.0-59.0)	
3-4 times a week[2]	28.0 (10.0-43.0)		1-3:0.767	45.5 (30.0-63.0)	
3-4 times a month[3]	30.5 (11.0-43.0)		1-4: ***0.029***	43.0 (36.0-57.0)	
Rarely[4]	25.0 (14.0-41.0)		***1-5: 0.012***	45.0 (32.0-63.0)	
None[5]	22.5 (12.0-33.0)	***0.023***[c]	2-3:0.561	44.5 (30.0-60.0)	0.416[c]
			2-4:0.059		
			2-5: ***0.020***		
			3-4:0.065		
			3-5: ***0.018***		
			4-5:0.240		

[a] Anova test; [c] Kruskal Wallis test

There was a significant positive correlation between STAI (trait) anxiety and PRAQ-R2 total score *(r:0.292, p<0.001)*, PRAQ- Fear of giving birth *(r:0.145, p=0.024)*, PRAQ- Worries about bearing a physically or mentally Handicapped Child *(r:0.270, p<0.001)*, and PRAQ-R2 Concern about Own Appearance *(r:0.254, p=<0.001)*. (Table 6)

Table 6. Spearman correlation analysis between STAI (trait) score and PRAQ total and subgroups scores.

	STAI score	
PRAQ-R2 total score	r: 0.292	p: ***<0.001***
PRAQ- Fear of giving birth	r: 0.145	p: ***0.024***
PRAQ- Worries about bearing a physically or mentally Handicapped Child	r: 0.270	p: ***<0.001***
PRAQ- Concern about Own Appearance	r: 0.254	p: ***<0.001***

STAI: State-Trait Anxiety Inventory **PRAQ-R2:** Pregnancy-Related Anxiety Questionnaire-Revised 2

Discussion

Previous studies have shown negative outcomes of pregnancy-related anxiety and associated obstetric and sociodemographic factors. Today, the widespread use of the Internet and access to health-related information on the Internet has become widespread. In addition to the previously described risk factors, social media, and internet use may have a role in the development of pregnancy-related anxiety. To reduce the negative outcomes of pregnancy-related anxiety, there is a need for screening for anxiety during pregnancy and management of related factors. The current study focused on potential factors such as socio-demographics, internet use, and trait anxiety which are associated with pregnancy anxiety. The current study has shown that the pregnancy-related Anxiety Scale score was higher in nulliparous than in multiparous. Having a chronic disease was related to a higher anxiety score. Anxiety scores were higher in pregnant women who used the internet as a source of information about pregnancy and those who used the internet more. There was a significant positive correlation between STAI (trait) anxiety and PRAQ total score.

The current study showed that pregnant women's mean scale score for STAI (trait) was 45.54 ± 6.32, for PRAQ-R2 total score was 27.80 ± 8.32, for PRAQ- Fear of giving birth score was 10.12 ± 3.92, for PRAQ- Worries about bearing a physically or mentally Handicapped Child score was 10.44 ± 4.11, and for PRAQ- Concern about Own Appearance score was 7.24 ± 2.86, respectively. Previous studies found 45.6 ± 8.1, and 25.63 ± 8.58 for PRAQ-R2 total score in Turkey.[15, 16] In the other countries, it was reported 29.32±7.84, 19.3±6.4, and 23.5± 6.6, respectively.[17-19] The current findings are similar to previous studies conducted in Turkey. When current findings were compared with studies conducted in other countries, higher anxiety scores were found. A recent study reported the prevalence of pregnancy-related anxiety as 15.2%. It has been reported that this rate can be higher in low- and middle-income countries than in high-income countries [20]. The current study supports that pregnancy-related anxiety is an important and common mental pathology. In the light of the available data, we believe that the frequency of pregnancy-related anxiety and related factors should be investigated further and early diagnosis should be given importance.

In the current study, maternal age, nulliparity, having chronic illness, and low education level of the husband were associated with anxiety during pregnancy. Many previous studies have reported that young maternal age and first pregnancy experience are associated with increased anxiety during pregnancy [21, 22]. Primigravidae and not having experience with pregnancy may be associated with increased anxiety. Ignorance and misinformation are the most important causes of anxiety [23]. For this reason, high anxiety may be an expected finding in young, inexperienced individuals who have experienced pregnancy for the first time. Young and nulliparous individuals may be riskier in terms of anxiety and should be considered in the follow-up of pregnant women. In addition, the current study showed that pregnancies over the age of 35 years were also associated with increased anxiety. In addition to studies associating pregnancy-related anxiety with young maternal age, it is known that advanced maternal age also causes increased anxiety [24]. The mother's previous bad pregnancy experiences and advanced age pregnancies which are increased fetal and maternal risk can be a source of stress. For this reason, anxiety can be expected to be higher especially in pregnant women over the age of 35 years. The mother's previous bad pregnancy experiences and advanced age pregnancies, where fetal and maternal risks increase, can be sources of stress. For this reason, anxiety can be expected to be higher, especially in pregnant women over the age of 35. Family physicians, who are in constant communication with patients, can reduce anxiety by informing individuals and providing patient education.

The current study showed that anxiety level was higher in pregnant women who obtained information via the internet and frequently used the internet to obtain information. Previous studies have reported that individuals with high anxiety refer to the Internet more for information, and searching for information online exacerbates their anxiety [11]. There is a complex relationship between online information seeking and anxiety. Pregnancy is a time of intense stress. During this period, the willingness of pregnant women to access online information may increase, which may further increase the anxiety caused by pregnancy [25]. This may explain the high anxiety scores of pregnant women who use the internet detected in the study. However, the current study is insufficient to evaluate the accuracy of the online information resources of pregnant women and the time spent on the Internet. In future studies, investigating the correct and incorrect information obtained online, the time spent online, and how pregnant women interpret the information they obtained may contribute to a better understanding of anxiety during pregnancy.

The current study also showed that trait anxiety had a significant positive correlation with pregnancy related anxiety. Huizink et al. reported a significant relationship between trait anxiety and pregnancy-related anxiety. They also reported that women with high anxiety levels may experience higher levels of anxiety during pregnancy [26]. Other studies also point to the relationship between trait anxiety and birth-related anxiety. A study among Norwegian women showed that women with high birth anxiety had higher levels of depression and trait anxiety [27]. Another study reported that trait anxiety was an important determinant of fear of childbirth, especially in nulliparous women [28]. The current findings are consistent with the literature and pointed to the relationship between trait anxiety and pregnancy-related anxiety. There are few opposing views that there is no link between trait anxiety and pregnancy-related anxiety. Dunkel et al. reported that pregnancy-related anxiety decreased after pregnancy, but trait anxiety did not change. They argued that pregnancy-related anxiety is only related to the mood experienced during pregnancy and has a different context from general anxiety [29]. In the light of the current literature and our findings, it is thought that the pregnancy related anxiety may increase in women with trait anxiety. We recommend that family physicians and health professionals who providing preconception care evaluate the anxiety status of individuals in the pre-pregnancy period.

Limitations

There are some limitations of our study. This study was designed as a cross-sectional and it cannot be generalized to society. Multicenter and large population studies are needed. The status of accessing information from the internet and the duration of internet use of the participants were based on personal statements. This may have been insufficient to measure the relationship between internet use and anxiety. In addition, the effect of the content of pregnancy-related information that the participants accessed via the internet on our outputs is unclear. In future studies, the effect of the true and false information obtained on the internet on anxiety levels should be examined. One of the strengths of the study is that it used a valid and reliable scale to measure pregnancy anxiety. Another strength is that it draws attention to pregnancy-related anxiety and related factors with an adequate sample size. Today, the effect of accessing health information via the internet, which has advantages and disadvantages, on pregnancy-related anxiety has been demonstrated. It can contribute to the reduction of negative outcomes by reemphasizing the precursors of anxiety during pregnancy, which can sometimes not be taken care of as much as necessary. It can be a guide for family physicians who provide preconception care and pregnancy follow-up in the fight against pregnancy-related anxiety.

Conclusion

The current study showed that age, parity, having a chronic disease, and husbands' education status were associated with pregnancy-related anxiety. Using the internet for information about pregnancy and the time spent on the internet is associated with increased anxiety during pregnancy. An individual's trait anxiety is also one of the precursors of pregnancy-related anxiety. Understanding the affecting factors of anxiety in pregnancy allows for elaborating preconception care interventions and identifying the increased risk for women. In addition, it contributes to the prediction and risk reduction of risky pregnancies in preconception care and pregnancy follow-ups.

Conflict of interest: No conflict of interest in this study.

Author Contributions		**Author Initials**
SCD	Study Conception and Design	YBC, BY
AD	Acquisition of Data	YBC
AID	Analysis and Interpretation of Data	BY
DM	Drafting of Manuscript	YBC, BY
CR	Critical Revision	YBC, BY

Financial support: None.

Acknowledgment: None.

Prior publication: This study was presented as an oral presentation at the 21st National Family Medicine Congress in 2022, Ankara, Turkey

References

1. Viswasam K, Eslick GD, Starcevic V. Prevalence, onset and course of anxiety disorders during pregnancy: A systematic review and meta analysis. J Affect Disord. 2019;255:27-40. https://doi.org/10.1016/j.jad.2019.05.016
2. Dencker A, Nilsson C, Begley C, Jangsten E, Mollberg M, Patel H, Wigert H, Hessman E, Sjöblom H, Sparud-Lundin C. Causes and outcomes in studies of fear of childbirth: A systematic review. Women Birth. 2019;32(2):99-111. https://doi.org/10.1016/j.wombi.2018.07.004
3. Runkle JD, Risley K, Roy M, Sugg MM. Association Between Perinatal Mental Health and Pregnancy and Neonatal Complications: A Retrospective Birth Cohort Study. Womens Health Issues. 2023;33(3):289-99. https://doi.org/10.1016/j.whi.2022.12.001
4. Ravid E, Salzer L, Arnon L, Eisner M, Wiznitzer A, Weller A, et al. Is there an association between maternal anxiety propensity and pregnancy outcomes? BMC Pregnancy Childbirth. 2018;18(1):287. https://doi.org/10.1186/s12884-018-1925-8
5. Grigoriadis S, Graves L, Peer M, Mamisashvili L, Tomlinson G, Vigod SN, et al. A systematic review and meta-analysis of the effects of antenatal anxiety on postpartum outcomes. Arch Womens Ment Health. 2019;22(5):543-56. https://doi.org/10.1007/s00737-018-0930-2
6. Opene B, Parker PB. Should we stress about stress? Implications of infertility on pregnancy-related anxiety and depression. Fertil Steril. 2023;120(6):1176-77. https://doi.org/10.1016/j.fertnstert.2023.10.002
7. Qian J, Zhou X, Sun X, Wu M, Sun S, Yu X. Effects of expressive writing intervention for women's PTSD, depression, anxiety and stress related to pregnancy: A meta-analysis of randomized controlled trials. Psychiatry Res. 2020;288:112933. https://doi.org/10.1016/j.psychres.2020.112933
8. Yang L, Sun J, Nan Y, Waqas A, Nisar A, Wang D, et al. Prevalence of perinatal anxiety and its determinants in mainland China: A systematic review and meta-analysis. J Affect Disord. 2023;323:193-203. https://doi.org/10.1016/j.jad.2022.11.075
9. Furtado M, Chow CHT, Owais S, Frey BN, Van Lieshout RJ. Risk factors of new onset anxiety and anxiety exacerbation in the perinatal period: A systematic review and meta-analysis. J Affect Disord. 2018;238:626-35. https://doi.org/10.1016/j.jad.2018.05.073
10. Coglianese F, Beltrame Vriz G, Soriani N, Piras GN, Comoretto RI, Clemente L, et al. Effect of Online Health Information Seeking on Anxiety in Hospitalized Pregnant Women: Cohort Study. JMIR Med Inform. 2020;8(5):e16793. https://doi.org/10.2196/16793
11. Prescott J, Mackie L, Rathbone AL. Predictors of health anxiety during pregnancy. Mhealth. 2018;4:16. https://doi.org/10.21037/mhealth.2018.04.04
12. Naja S, Al Kubaisi N, Singh R, Bougmiza I. Generalized and pregnancy-related anxiety prevalence and predictors among pregnant women attending primary health care in Qatar, 2018-2019. Heliyon. 2020;6(10):e05264. https://doi.org/10.1016/j.heliyon.2020.e05264
13. Aksoy Derya Y, Timur Tashan S, Duman M, Durgun Ozan Y. Turkish adaptation of the pregnancy-related anxiety questionnaire-revised 2: Validity and reliability study in multiparous and primiparous pregnancy. Midwifery. 2018;62:61-8. https://doi.org/10.1016/j.midw.2018.03.006
14. Oner N, Le Compte A. Stait and trait anxiety inventory manual. 1st Ed. Istanbul, Boğaziçi University Publication 1983; 1-26.
15. Durgun Ozan Y, Alp Yilmaz F. Is there a relationship between basic birth beliefs and pregnancy-related anxiety in Turkey. J Obstet Gynaecol Res. 2020;46(10):2036-42. https://doi.org/10.1111/jog.14375
16. Yesilcınar I, Acavut G, Guvenc G. Anxiety during the pregnancy and affecting factors: a cross-sectional study. Arch Gynecol Obstet. 2023;307(1):301-9. https://doi.org/10.1007/s00404-022-06590-5
17. Arch JJ. Pregnancy-specific anxiety: which women are highest and what are the alcohol-related risks? Compr Psychiatry. 2013;54(3):217-28. https://doi.org/10.1016/j.comppsych.2012.07.010
18. Wyatt S, Ostbye T, De Silva V, Lakmali P, Long Q. Predictors and occurrence of antenatal depressive symptoms in Galle, Sri Lanka: a mixed-methods cross-sectional study. BMC Pregnancy Childbirth. 2021;21(1):758. https://doi.org/10.1186/s12884-021-04239-w
19. Lehtola SJ, Tuulari JJ, Karlsson L, Lewis JD, Fonov VS, Collins DL, et al. Sex-specific associations between maternal pregnancy-specific anxiety and newborn amygdalar volumes - preliminary findings from the FinnBrain Birth Cohort Study. Stress. 2022;25(1):213-226. https://doi.org/10.1080/10253890.2022.2061347
20. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. Br J Psychiatry. 2017;210(5):315-23. https://doi.org/10.1192/bjp.bp.116.187179
21. Tarafa H, Alemayehu Y, Nigussie M. Factors associated with pregnancy-related anxiety among pregnant women attending antenatal care follow-up at Bedelle general hospital and Metu Karl comprehensive specialized hospital, Southwest Ethiopia. Front Psychiatry. 2022;13:938277. https://doi.org/10.3389/fpsyt.2022.938277
22. Rubertsson C, Hellström J, Cross M, Sydsjö G. Anxiety in early pregnancy: prevalence and contributing factors. Arch Womens Ment Health. 2014;17(3):221-8. https://doi.org/10.1007/s00737-013-0409-0
23. Park SC, Kim YK. Anxiety disorders in the DSM-5: changes, controversies, and future directions. Adv Exp Med Biol. 2020;1191:187-96. https://doi.org/10.1007/978-981-32-9705-0_12
24. Akinsulore A, Temidayo AM, Oloniniyi IO, Olalekan BO, Yetunde OB. Pregnancy-related anxiety symptoms and associated factors amongst pregnant women attending a tertiary hospital in south-west Nigeria. S Afr J Psychiatr. 2021;27:1616. https://doi.org/10.4102%2Fsajpsychiatry.v27i0.1616
25. Prescott J, Mackie L. "You sort of go down a rabbit hole...You're just going to keep on searching": a qualitative study of searching online for pregnancy-related information during pregnancy. J Med Internet Res. 2017;19(6):e194. https://doi.org/10.2196/jmir.6302
26. Huizink AC, Menting B, Oosterman M, Verhage ML, Kunseler FC, Schuengel C. The interrelationship between pregnancy-specific anxiety and general anxiety across pregnancy: a longitudinal study. J Psychosom Obstet Gynaecol. 2014;35(3):92-100. https://doi.org/10.3109/0167482x.2014.944498
27. Storksen HT, Eberhard-Gran M, Garthus-Niegel S, Eskild A. Fear of childbirth; the relation to anxiety and depression. Acta Obstet Gynecol Scand. 2012;91(2):237-42. https://doi.org/10.1111/j.1600-0412.2011.01323.x
28. Jokić-Begić N, Zigić L, Nakić Radoš S. Anxiety and anxiety sensitivity as predictors of fear of childbirth: different patterns for nulliparous and parous women. J Psychosom Obstet Gynaecol. 2014;35(1):22-8. https://doi.org/10.3109/0167482x.2013.866647
29. Dunkel Schetter C, Tanner L. Anxiety, depression and stress in pregnancy: implications for mothers, children, research, and practice. Curr Opin Psychiatry. 2012;25(2):141-8. https://doi.org/10.1097/yco.0b013e3283503680