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DOES COVID-19 PANDEMIA HAVE AN EFFECT ON PRENATAL DISTRESS AND RISK PERCEPTION IN PREGNANCY?

COVID-19 PANDEMİSİNİN GEBELİKTE DOĞUM ÖNCESİ DİSTRES VE RİSK ALGISI ÜZERİNDE ETKİSİ VAR MI?

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Abstract

Aim: The study was conducted to determine the effects of COVID-19 on prenatal distress and risk perception in pregnancy.

Method: This cross-sectional study was conducted by using a web-based online questionnaire. A total of 202 pregnant women participated in the study. All volunteer pregnant women who came to the outpatient clinic between June and September 2020 were included in the study. The pregnant women admitting to the Obstetrics and Gynecology Clinic of the Health Practice and Research Hospital due to routine follow-up were included in the study. In the data collection, firstly, the telephones of those who agreed to participate in the study were recorded. Then, a questionnaire link was sent to the telephones of these pregnant women over WhatsApp, and they were asked to fill in it. The Pregnant Information Form, Revised Prenatal Distress Questionnaire and Perception of Pregnancy Risk Questionnaire were used as the data collection tools. There were three parts in the link. The first part included Pregnant Information Form, the second part included NuPDQ and PPRQ to evaluate the pre-pandemia status, and the third part included NuPDQ and PPRQ to evaluate their status in the pandemia process. An explanatory text was added to the second part of the questionnaire link, which stated that they should respond by considering their pre-pandemia status. In the third part, another explanatory text was added stating that they must respond according to the pandemia process they were in.

Results: The second measurement (during covid-19) values of Perception of Pregnancy Risk Questionnaire-Total and Sub-dimension scores and Concerns of the pregnant women about the healthcare quality and health status were statistically higher than the initial measurement (before covid-19) values. In the study, the distress level was found to increase as the perception risk increased in pregnancy. It was also determined that pregnant women who had living children felt more risk before and during the pandemia than those who had no children at all, and this risk perception score increased at significant levels during the pandemia.

Conclusion: The strategies aiming at maternal stress, such as providing effective communication and psychological assistance, can be particularly useful for women and their fetuses to avoid negative outcomes.

Keywords: Anxiety, COVID-19, Distress, Pregnancy, Risk Perception

Özet

Amaç: Çalışma, COVID-19'un gebelikte doğum öncesi distres ve risk algısı üzerindeki etkilerini belirlemek amacıyla yapılmıştır.

Yöntem: Bu kesitsel çalışma web tabanlı çevrimiçi bir anket kullanılarak gerçekleştirilmiştir. Araştırmaya toplam 202 gebe katılmıştır. Çalışmaya Haziran-Eylül 2020 tarihleri arasında Sağlık Uygulama ve Araştırma Hastanesi Kadın Hastalıkları ve Doğum Kliniğine rutin takip nedeniyle başvuran tüm gönüllü gebeler dahil edilmiştir. Verilerin toplanmasında öncelikle araştırmaya katılmayı kabul edenlerin telefonları kayıt altına alınmıştır. Daha sonra bu gebelerin telefonlarına WhatsApp üzerinden anket linki gönderilerek, bu linki doldurmaları istenmiştir. Veri toplama aracı olarak Gebe Bilgi Formu, Revize Edilmiş Prenatal Distres Ölçeği ve Gebelik Risk Algısı Ölçeği kullanılmıştır. Veriler üç bölümde toplanmıştır. Birinci bölümde Gebe Bilgi Formu, ikinci bölümde pandemi öncesi durumu değerlendirmek için NuPDQ ve PPRQ, üçüncü bölümde ise pandemi sürecindeki durumlarını değerlendirmek için NuPDQ ve PPRQ yer almıştır. Anket bağlantısının ikinci kısmına pandemi öncesi durumlarını dikkate alarak yanıt vermeleri gerektiğini belirten açıklayıcı bir metin eklenmiştir. Üçüncü bölümde ise içinde bulundukları pandemi sürecine göre tepki vermeleri gerektiğini belirten açıklayıcı bir metin eklenmiştir.

Bulgular: Gebelik RiskAlgısı Ölçeği-Toplam ve Alt Boyut puanları ile gebelerin sağlık kalitesi ve sağlık durumu ile ilgili endişelerinin ikinci ölçüm (covid-19 sırasında) değerleri ilk ölçümden (covid-19 öncesi) istatistiksel olarak daha yüksek bulunmuştur. Araştırmada gebelikte risk algısı arttıkça distres düzeyinin arttığı tespit edilmiştir. Yaşayan çocuğu olan gebelerin, pandemi öncesi ve pandemi sırasında, hiç çocuğu olmayanlara göre daha fazla risk hissettikleri ve bu risk algılama puanının pandemi sırasında anlamlı düzeyde arttığı belirlenmiştir.

Sonuç: Etkili iletişim ve psikolojik yardım sağlanması gibi maternal stresi hedefleyen stratejiler, kadınlar ve fetüsleri için olumsuz sonuçları önlemek için özellikle yararlı olabilir.

Anahtar Kelimeler: Anksiyete, COVID 19, Distres, Gebelik, Risk algısı

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INTRODUCTION

The outbreak of coronavirus diseases (COVID-19) has been substantially influencing the life and living of people across the world, especially after the declaration of a global pandemic by the World Health Organization in the second week of March 2020. The COVID-19 pandemic has influenced many aspects of life, including women's pregnancy, birth and postnatal period (1,2).

The rapid spread of COVID-19, the lack of its specific treatment which has not yet been proven to be reliable and effective, and the fact that it is fatal increase its effects. No increased sensitivity was reported in pregnant women compared to the general population. A study conducted in the UK reported 6% rate of pregnant women among COVID-19 infected individuals. The data showed that COVID-19 infection did not proceed more severely in pregnant women, which was different from the previous Coronavirus and influenza outbreaks compared to non-pregnant individuals (3,4). Pregnancy is a physiological process that makes women vulnerable to viral infections, and causes partial suppression in the immune system. Morbidity rates increase during pregnancy even in the seasonal flu. The 1918 influenza pandemia caused a mortality rate of 2.6% in the overall population, but 37% among pregnant women. For this reason, pregnant women might have high anxiety and concern levels due to the COVID-19 outbreak (3–6).

Factors, which can increase the risk of perinatal mental health problems significantly during a pandemia, can be listed as maternal isolation, increased psychosocial risk during socio-economic crises, increasing maternal anxiety, relation conflicts, and decreased contact with healthcare professionals. Many women refused to go to the hospital for pregnancy follow-ups, and the number of pregnant women who wanted to give birth by caesarean section instead of waiting for childbirth in the hospital increased due to anxiety and concern related to Covid-19 pandemia. There are increasing concerns about not being able to access social support systems (family/friends) during pregnancy, childbirth, and post-partum period due to quarantine restrictions or transportation problems. Also, some mothers are seriously concerned about this process in terms of postpartum care, such as breastfeeding and neonatal care (e.g. postpartum vaccination, screening) (7–10).

Limited studies conducted during current pandemia reveal anxiety rates ranging between 63% and 68% during pregnancy (10–12). In a previous study, 31.1% of the pregnant women were found to have poor mental health scores compared to the anxiety and depression scores during pandemia. Anxiety was detected in 10.3% among these women, depression in 28.6%, and both anxiety and depression in 7.8% (13). A total of 36 of 71 pregnant women (50.7%) in Ireland were reported to have excessive concerns about their health during the COVID-19 outbreak (14).

The consequences of the pandemia might have unintended effects on women and families. During pregnancy, stress might cause preeclampsia, depression, nausea, and vomiting. In addition, increased maternal stress might cause premature birth, low birth weight, and an increase in low APGAR score risk. Increased stress in pregnant women might pose a risk of psychiatric illness in the fetus by interfering with its neural development. It can also cause postpartum complications, such as stress, postpartum depression, and poor parental ties (15,16).

Studies conducted on psychological effects of the global pandemic in the general population are inadequate, especially those focusing on pregnant women. Although there are studies (10,11,13,17,18) in the literature examining the anxiety and depression status of pregnant women infected with Covid-19, the number of these studies is limited. Also, no studies were detected comparing the distress and risk perceptions of pregnant women before and after COVID-19. The present study was

conducted to determine the effects of COVID-19 pandemia on prenatal distress and risk perception in pregnancy.

Research questions;

Does the COVID-19 pandemic have an impact on prenatal distress and risk perception in pregnancy?

Do some demographic and obstetric features affect prenatal distress and risk perception in pregnancy?

MATERIAL AND METHODS

Study Design

This cross-sectional study was conducted by using a web-based online questionnaire between June and September 2020.

Study Sample

The study was conducted in the Obstetrics and Gynecology Clinic of the Health Practice and Research Hospital between June and September 2020. All pregnant who applied to obstetrics and gynecology clinic between the specified dates, who met the study criteria and agreed to participate in the study were included in the sample. A total of 202 pregnant women participated in the study. The study was conducted on pregnant women who were over 18 years old, were willing to complete an online survey, could read and understand Turkish, could use internet, had no history of psychological disorders, and did not use any psychiatric medication.

Data Collection Tools

The Pregnant Introduction Form, Revised Prenatal Distress Questionnaire and Perception of Pregnancy Risk Questionnaire were used as the data collection tools. The pregnant women were contacted online to avoid the risk for the participants and researchers in the pandemia process. The questionnaire was created by using an online questionnaire application. The questionnaires and the scales could be answered in approximately 5-7 minutes.

Pregnant Introduction Form: It was created to determine the socio-demographic characteristics of the pregnant women (i.e. age, educational status, income status, number of children, and presence of chronic diseases). This form consists of 11 questions prepared by the researchers.

Revised Pregnancy Distress Questionnaire (NuPDQ): The Prenatal Distress Questionnaire was developed by Yali and Lobel (19) to evaluate pregnant women's social relations, physical and emotional symptoms in pregnancy and concerns for both themselves and their babies. The scale was revised by Lobel, increasing the number of items from 12 to 17. The Turkish validity and reliability study of the scale was performed by Yüksel et al. (20). It was found that its Turkish form is an easy-to-apply, understandable, valid and reliable tool for the evaluation of the stress levels that may occur during pregnancy in pregnant women in our country (20).

The items of the Likert-style scale are scored between "0" and "2". Pregnant women are asked to respond by reading each expression, and selecting one of the options during the implementation of the scale ("Never-0", "A little-1", and "Too much-2"). The sum of the scores of the items is taken between "0" and "34". The scale has no cut-off score. The pregnancy-specific distress score during pregnancy is obtained by collecting the scale item scores. A higher scale score indicates a higher level of prenatal distress. In the study conducted by Yüksel et al., the Cronbach Alpha Coefficient was determined as 0.85 (20).

In the validity and reliability study of the scale, it is stated that the PDO-Revised Version had four sub-dimensions:

- Factor 1: "Physical and Social Changes due to Pregnancy, Concerns about Baby and Birth Action" dimension (Items 1, 3, 4, 6, 7, 8, 10, 11, 12),

- Factor 2: "Concerns about Healthcare Quality and Health Status" dimension (Items 2, 9, 17),

- Factor 3: "Concerns about Baby Care and Postpartum Life" dimension (Items 13, 15, 16),

- Factor 4: "Material Concerns" dimension (Items 5, 14).

Perception of Pregnancy Risk Questionnaire (PPRQ): The scale was developed by Heaman and Gupton to evaluate the risk perceptions of pregnant women. The scale, which had 11 items when it was first developed, was revised by the authors. The final version of the scale consists of 9 items. The scale is a visual-analog measurement tool. The total Cronbach Alpha Coefficient of the scale is 0.84. Its validity and reliability was conducted by Evcili and Dağlar (21).

The scale consists of 2 factors and 9 items. There is a 0-100 mm linear line just below each item of the scale with the statements "No risk at all" and "Extremely high risk." The total score of the scale is obtained by adding the scores of each of the 9 items and dividing the result by 9.

The scoring of the scale factors can be made as follows. The score of the factor "Risk perception of the pregnant woman about her baby" is found by adding the scores of each of the 5 items under this factor, and then by dividing the result by 5.

The score of the factor "The risk perception of the pregnant woman about herself" is found by adding the scores of the 4 items under this factor, and then dividing the result by 4. The scale has no cut-off score. As the score received from the scale increases, it is accepted that the risk perception associated with the pregnant woman about herself and her baby also increases. The sub-dimensions of the scale are as follows (21).

-Factor 1. The risk perception of the pregnant woman about her baby: Item 2, Item 6, Item 7, Item 8, Item 9.

-Factor 2. The risk perception of the pregnant woman about herself: 1, Item 3, Item 4, Item 5.

The Cronbach Alpha Coefficient of the scales in this study is shown in Table 1.

Table 1. Cronbach Alpha Coefficients of Scales

	Cronbach Alfa	
NuPDQ and PPRQ	1st measurement	2nd measurement
NuPDQ-Total	0.834	0.876
NuPDQ-Factor 1	0.769	0.817
NuPDQ-Factor 2	0.337	0.542
NuPDQ-Factor 3	0.688	0.729
NuPDQ-Factor 4	0.688	0.743
PPRQ-Total	0.898	0.926
PPRQ-Factor 1	0.887	0.912
PPRQ-Factor 2	0.733	0,788

Data Collection

In the data collection, firstly, the pregnant women who came to the clinic were informed about the study; and the telephones of those who agreed to participate in the study were recorded. Then, a questionnaire link was sent to the telephones of these pregnant women over WhatsApp, and they were asked to fill in it. There were three parts in the link. The first part included Pregnant Information Form, the second part included NuPDQ and PPRQ to evaluate the pre-pandemia status, and the third part included NuPDQ and PPRQ to evaluate their status in the pandemia process. An explanatory text was added to the second part of the questionnaire link, which stated that they should respond by considering their pre-pandemia status. In the third part, another explanatory text was added stating that they must respond according to the pandemia process they were in. The scale was applied in one go, and they were asked to make the first assessment by considering the pre-Covid period. Considering the current time (Covid), they were expected to make the second assessment.

Data Analysis

The data were evaluated in the IBM SPSS Statistics Standard Concurrent User V 25 (IBM Corp., Armonk, New York, USA) statistical package program. Descriptive statistics were given as unit count (n),

percentage (%), mean ± standard deviation ($\bar{x}$±sd), median (M), minimum value (min), maximum value (max), first quarter (Q1), and third quarter (Q3) values. The normal distribution of the data for numeric variables was evaluated with the Shapiro Wilk Normality Test and Q-Q graphics. The homogeneity of the variables was evaluated with the Levine Test. The first and second measurements of the scale scores in the Study Group were compared with the Paired t-Test. Pearson Correlation Analysis of the relations between each other and age variable of the scale scores, and the relation of the scale scores with gestational weeks were evaluated with the Spearman Correlation Analysis. The first and second measurement comparisons of the scale scores according to the socio-demographic characteristics of the pregnant women were done in repeated measurements with Two-Way Variance Analysis, which is one of the general linear models. When there were differences in the repeated measurements according to the results of the Two-Way Variance Analysis, the main effects were evaluated with the Bonferroni Multiple Corrected Comparison Tests. p<0.05 was considered to be statistically significant in all comparisons. The measurement before the pandemia was evaluated as the first measurement, and the measurement during the pandemia was evaluated as the second measurement.

Ethical Considerations

The present study was approved by the Hatay Mustafa Kemal University Scientific Research Ethics Committee (2020/08). In addition, written permission was obtained from the Ministry of Health. An electronic informed consent was presented on the first page of the online survey. The participants were electronically informed on the first page of the survey that they were volunteering to participate and that they could withdraw from the survey at any time.

RESULTS

A total of 202 pregnant women participated in the study. The age range of the pregnant women was 17-43 years, and the mean age was 29.4±5.4 years. The median gestational week was 27. The number of the pregnant women with 1 pregnancy was 77 (38.1%), the number of living children was 1 in 74 (36.6%), 135 did not work (66.8%), 101 (50.0%) had a bachelor's and above educational status, and 143 (70.8%) had moderate income status. All pregnant women were married. Chronic disease was present in 28 (14.5%) of the 193 pregnant women who answered the questions in the Chronic Disease Status part. The number of the pregnant women who reported having COVID-19-related problems (respiratory distress, decrease/increase in blood pressure, etc.) during pregnancy was 11 (5.4%).

The first and second measurement values of all scale scores are compared in Table 2. The differences between the first and second measurement values of the NuPDQ-Total score of the pregnant women were not statistically significant. Among the sub-dimensions, the "Concerns of the pregnant women about the healthcare quality and health status (p=0.002), and the second measurement values of PPRQ-Total and Sub-dimension Scores were statistically higher than the initial measurement values (p<0.001).

Table 2. Comparison of the first and second measures of scale scores (N=202)

	Measurement Values				***Test Statistics***	
NuPDQ and PPRQ	1st measurement $\bar{x} \pm ss$		2nd measurement $\bar{x} \pm ss$		*t*	*P*
NuPDQ-Total	12.44	5.93	12.70	6.60	0.839	0.402
NuPDQ-Factor 1	8.30	3.60	8.23	3.87	0.369	0.712
NuPDQ-Factor 2	1.18	1.22	1.42	1.37	**3.140**	**0.002**
NuPDQ-Factor 3	1.87	1.63	2.02	1.70	1.809	0.072
NuPDQ-Factor 4	1.09	1.19	1.00	1.17	1.551	0.123
PPRQ-Total	3.73	2.04	4.14	2.23	**6.003**	**<0.001**
PPRQ-Factor 1	3.49	2.22	3.85	2.36	**4.944**	**<0.001**
PPRQ-Factor 2	4.02	2.12	4.51	2.26	**6.015**	**<0.001**

t: Paired t test
1st measurement : before covid-19. 2nd measurement : during covid-19
NuPDQ-Factor 1: "Physical and Social Changes due to Pregnancy. Concerns about Baby and Birth Action" dimension
NuPDQ-Factor 2: "Concerns about Healthcare Quality and Health Status" dimension
NuPDQ-Factor 3: "Concerns about Baby Care and Postpartum Life" dimension
NuPDQ-Factor 4: "Material Concerns" dimension
PPRQ-Factor 1: The risk perception of the pregnant woman about her baby
PPRQ-Factor 2: The risk perception of the pregnant woman about herself

When the total scores of the scales were evaluated in the first and second measurements, a moderate and positive correlation (r=0.471; p<0.001) (r=0.556; p<0.001) was detected between NuPDQ-Total and PPRQ-Total scores. Also, the first and the second measurements had weak or moderate and positive relations with the total and sub-dimension scores of the scales (Table 3).

Table 3. Correlation between NuPDQ and PPRQ scores in first and second measurement

	PPRQ -Total				**PPRQ -F1**				**PPRQ -F2**			
NuPDQ	1st measurement		2nd measurement		1st measurement		2nd measurement		1st measurement		2nd measurement	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*R*	*p*	*r*	*p*
NuPDQ-T	0.471	<0.001	0.556	<0.001	0.465	<0.001	0.520	<0.001	0.411	<0.001	0.556	<0.001
NuPDQ-F1	0.441	<0.001	0.532	<0.001	0.430	<0.001	0.498	<0.001	0.392	<0.001	0.532	<0.001
NuPDQ-F2	0.302	<0.001	0.435	<0.001	0.294	<0.001	0.418	<0.001	0.269	<0.001	0.419	<0.001
NuPDQ-F3	0.310	<0.001	0.356	<0.001	0.311	<0.001	0.330	<0.001	0.265	<0.001	0.360	<0.001
NuPDQ-F4	0.282	<0.001	0.345	<0.001	0.294	<0.001	0.316	<0.001	0.226	0.001	0.352	<0.001

r:Pearson Correlation Coefficient

According to Table 4, there was a weak and positive correlation between the PPRQ-Total (r=0,186; p<0,008, r=0,189; p<0,001), age, and "The risk perception of the pregnant women about herself" (r=0,311; p<0,001, r=0,280; p<0,001). No statistically significant relations were detected between the gestational week and scale scores in the first and second measurements.

Table 4. Correlation between first and second measurement scores and age and gestational week

	Age				**Gestational week**			
NuPDQ and PPRQ	1st measurement		2nd measurement		1st measurement		2nd measurement	
	r	*p*	*r*	*p*	*rho*	*p*	*rho*	*P*
NuPDQ-T	0.010	0.884	-0.003	0.965	0.042	0.556	-0.057	0.422
NuPDQ-F1	-0.012	0.871	-0.068	0.342	0.073	0.302	-0.063	0.372
NuPDQ-F2	0.015	0.835	0.008	0.906	0.067	0.344	0.006	0.934
NuPDQ-F3	0.058	0.410	0.109	0.124	-0.048	0.497	-0.111	0.117
NuPDQ-F4	-0.008	0.914	0.015	0.838	-0.035	0.620	-0.030	0.676
PPRQ-T	**0.186**	**0.008**	**0.189**	**0.007**	0.034	0.634	-0.018	0.799
PPRQ -F1	0.069	0.328	0.107	0.130	0.019	0.786	-0.031	0.660
PPRQ -F2	**0.311**	**<0.001**	**0.280**	**<0.001**	0.053	0.457	-0.020	0.779

r:Pearson Correlation Coefficient; rho: Spearman Correlation Coefficient

The NuPDQ-Total score in the first and second measurements was statistically similar to the number of the pregnancies, as shown in Table 5. The first and second measurement values were statistically similar according to the intra-group comparisons. The PPRQ-Total scores varied at statistical levels according to the pregnancy count in the first and second measurements in inter-group comparisons. In both measurements, the scores of those with 1 pregnancy was statistically lower than the other groups. The scores of the other two groups were similar. According to the intra-group comparisons, the second measurement scores of those who had pregnancy count as 1 and 2 were statistically higher than their first measurement scores. No statistical changes were detected in the scores of those whose pregnancy count was 3 and above.

The NuPDQ-Total scores were statistically similar in the first and second measurements according to the number of living children. According to the intra-group comparisons, the first and second measurement values were statistically similar. According to inter-group comparisons, PPRQ-Total scores varied at statistical levels according to the number of living children in the first and second measurements. In the first measurements, the scores of those with one or two children were statistically higher than those without children. In the second measurements, the scores of those who had one child were statistically higher than those without children. The scores of those with two children were similar to the other two groups. According to intra-group comparisons, statistical increases were detected in the second measurement scores of those without children and those with only one child (Table 5).

Table 5. Comparison of the scale mean scores in the first and second measurements according to the number of pregnancies and children

Measurement time	**Number of Pregnancy**						***Test Statistics***	
	1 *n*=77		**2** *n*=66		**3 *and* ↑** *n*=59			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
NuPDQ-Total								
1st measurement	12.82	6.60	12.44	6.16	11.95	4.68	0.356	0.701
2nd measurement	12.87	7.20	13.52	6.77	11.58	5.45	1.376	0.255
Test Statistics	*F*=0.011; *p*=0.915		*F*=3.066; *p*=0.061		*F*=0.448; *p*=0.504			
Group effect: *F*=0.787; *p*=0.456 Measurement effect: *F*=0.688; *p*=0.408 Group X Measurement effect: *F*=1.907; *p*=0.151								
PPRQ-Total								
1st measurement	3.05^{a}	1.95	4.04^{b}	2.11	4.26^{b}	1.85	**7.396**	**0.001**
2nd measurement	3.39^{a}	2.08	4.78^{b}	2.41	4.41^{b}	1.94	**8.014**	**<0.001**
Test Statistics	*F*=**9.503**; *p*=**0.002**		*F*=**39.537**; *p*<**0.001**		*F*=1.499; *p*=0.222			
Group effect: *F*=7.812; *p*=0.001 Measurement effect: *F*=36.604; *p*<0.001 Group X Measurement effect: *F*=6.302; *p*=0.002								
	Number of Children						***Test Statistics***	
	Absent *n*=72		**One** *n*=74		**Two** *n*=56			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
NuPDQ-Total								
1st measurement	13.18	6.18	12.48	6.32	11.45	4.96	1.349	0.262
2nd measurement	13.04	6.90	13.27	6.71	11.50	5.98	1.302	0.274
Test Statistics	*F*=0.076; *p*=0.783		*F*=2.494; *p*=0.116		*F*=0.009; *p*=0.926			
Group effect: *F*=1.735; *p*=0.255 Ölçüm Etkisi: *F*=0.593; *p*=0.442 Group X Measurement effect: *F*=0.938; *p*=0.393								
PPRQ-Total								
1st measurement	3.15^{a}	1.95	4.02^{b}	2.13	4.08^{b}	1.89	**4.696**	**0.010**
2nd measurement	3.42^{a}	2.04	4.70^{b}	2.37	4.33^{ab}	2.04	**6.621**	**0.002**
Test Statistics	*F*=**5.820**; *p*=**0.017**		*F*=**36.353**; *p*<**0.001**		*F*=3.690; *p*=0.056			
Group effect: *F*=5.814; *p*=0.004 Measurement effect: *F*=34.078; *p*<0.001 Group X Measurement effect: *F*=4.320; *p*=0.015								

Superscripts a and b show the difference between groups in each measurement. Groups with the same letters are similar.

According to inter-group comparisons, the NuPDQ-Total scores varied at statistical levels in the first and second measurements according to the working status. The scores of working participants (13.70±7.16; 14.21±7.35) were higher at statistical levels than those that did not work (11±80±5.12; 11.93± 6.07). According to the working status, no statistical changes were detected. According to the intra-group comparisons, PPRQ-Total scores were statistically similar in those who worked and who did not work in the first and second measurements. According to the intra-group comparisons, the second measurement scores of the pregnant women who worked and who did not work were statistically high (Table 6).

The first measurement NuPDQ-Total scores were not statistically different according to the educational status of the pregnant women. In the second measurements, the scores of those with undergraduate and higher educational levels (13.97±7.23) were statistically higher than those with primary educational status (10.80 5.47). The scores of high school graduates were similar to those of the other two groups. According to the intra-group comparisons, the second measurement scores of those with undergraduate and graduate educational levels were statistically higher than in the first measurements. The changes in the scores of elementary and high school graduates were not statistically significant. The PPRQ-Total scores were not statistically different in the first and second measurements according to the educational status in the inter-group comparisons. However, according to the intra-group comparisons, the second measurement scores of high school graduates (4.36±2.61) and of those with undergraduate levels (4.09±2.08) were statistically higher than in the first measurements (3±91±2.52; 3.65±1.78) (Table 6).

In inter-group comparisons, the first measurement NuPDQ-Total scores were statistically similar according to income status groups. In the second measurements, the scores of those with poor income status were statistically higher than those who had good and medium income status. According to intra-group comparisons, the first and second measurement scores of the income status groups were statistically similar. According to the inter-group comparisons, the first and second measurement PPRQ-Total scores were statistically different according to the income status groups. The scores of the pregnant women who had poor income levels were statistically higher than those who had moderate income status in both measurements. According to the intra-group comparisons, the second measurement scores of the groups were statistically high in all income levels (Table 6).

According to the inter-group comparisons, NuPDQ-total scores of those who had chronic diseases were statistically high in the first and second measurements. In intra-group comparisons, on the other hand, the first and second measurement values were similar in both groups. According to the inter-group comparisons, the PPRQ-Total scores of those with chronic diseases were statistically high in the first and second measurements. In intra-group comparisons, the second measurement scores of those who did not have chronic diseases were statistically high. According to inter-group comparisons, the risk perception scores of those with chronic diseases about their babies were statistically high in the first and second measurements. In the intra-group comparisons, the second measurement scores of those who did not have chronic diseases were statistically high (Table 6).

Table 6. Scale Scores in the first and second measurements according to the working. education. income and chronic disease status

Measurement time	Working status				*Test Statistics*	
	Unemployed *n*=135		**Employed** *n*=67			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
NuPDQ-Total						
1st measurement	11.80	5.12	13.70	7.16	**4.641**	**0.032**
2nd measurement	11.93	6.07	14.21	7.35	**5.424**	**0.021**
Test Statistics	*F*=0.117; *p*=0.732		*F*=0.931; *p*=0.336			
Group effect: *F*=5.718; *p*=0.018 Measurement effect: *F*=0.971; *p*=0.326 Group X Measurement effect: *F*=0.347; *p*=0.557						
PPRQ-Total						
1st measurement	3.65	2.06	3.88	2.00	0.562	0.454
2nd measurement	3.98	2.15	4.47	2.37	2.237	0.136
Test Statistics	*F*=**15.047**; *p*<**0.001**		*F*=**24.779**; *p*<**0.001**			
Group effect: *F*=1.365; *p*=0.244 Measurement effect: *F*=39.734; *p*<0.001 Group X Measurement effect: *F*=3.369;*p*=0.068						

	Educational status						*Test Statistics*	
	Primary *n*=41		**High** *n*=60		**Undergraduate** *n*=101			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
NuPDQ-Total								
1st measurement	10.93	4.46	12.67	6.12	12.91	6.28	1.674	0.190
2nd measurement	10.80^{a}	5.47	11.83^{ab}	5.78	13.97^{b}	7.23	**4.158**	**0.017**
Test Statistics	*F*=0.035; *p*=0.852		*F*=2.324; *p*=0.129		*F*=**6.266**; *p*=**0.013**			
Group effect: *F*=2.912; *p*=0.057 Measurement effect: *F*=0.011; *p*=0.916 Group X Measurement effect: *F*=3.950; *p*=0.021								
PPRQ-Total								
1st measurement	3.64	1.86	3.91	2.52	3.65	1.78	0.342	0.711
2nd measurement	3.94	1.98	4.36	2.61	4.09	2.08	0.494	0.611
Test Statistics	*F*=3.755; *p*=0.054		*F*=**12.832**; *p*<**0.001**		*F*=**19.953**; *p*<**0.001**			
Group effect: *F*=0.428; *p*=0.652 Measurement effect: *F*=28.710; *p*<0.001 Group X Measurement effect: *F*=0.367;*p*=0.694								

	Income Status						*Test Statistics*	
	Good *n*=43		**Medium** *n*=143		**Poor** *n*=16			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
NuPDQ-Total								
1st measurement	12.05	5.92	12.18	5.73	16.00	7.05	2.988	0.053
2nd measurement	11.95^{a}	7.59	12.46^{a}	6.11	17.00^{b}	6.94	**3.646**	**0.028**
Test Statistics	*F*=0.020; *p*=0.888		*F*=0.606; *p*=0.437		*F*=0.807; *p*=0.370			
Group effect: *F*=3.761; *p*=0.025 Measurement effect: *F*=0.784; *p*=0.377 Group X Measurement effect: *F*=0.367; *p*=0.693								
PPRQ-Total								
1st measurement	3.79^{ab}	2.00	3.57^{a}	1.95	4.97^{b}	2.56	**3.495**	**0.032**
2nd measurement	4.27^{ab}	2.31	3.94^{a}	2.08	5.63^{b}	2.79	**4.364**	**0.014**
Test Statistics	*F*=**10.054**; *p*=**0.002**		*F*=**20.147**; *p*<**0.001**		*F*=**7.202**; *p*=**0.008**			
Group effect: *F*=4.153; *p*=0.017 Measurement effect: *F*=25.233; *p*<0.001 Group X Measurement effect: *F*=0.733; *p*=0.482								

	Chronic Disease Status				*Test Statistics*	
	No *n*=165		**Yes** *n*=28			
	$\bar{x}$	*ss*	$\bar{x}$	*ss*	*F*	*p*
NuPDQ-Total						
1st measurement	11.93	5.74	14.79	6.83	**5.603**	**0.019**
2nd measurement	12.17	6.34	15.46	8.06	**5.948**	**0.016**
Test Statistics	*F*=0.488; *p*=0.486		*F*=0.674; *p*=0.413			
Group effect: *F*=6.565; *p*=0.011 Measurement effect: *F*=1.052; *p*=0.306 Group X Measurement effect: *F*=0.241; *p*=0.624						
PPRQ-Total						
1st measurement	3.54	1.89	5.02	2.61	**12.962**	**<0.001**
2nd measurement	3.98	2.11	5.35	2.76	**9.163**	**0.003**
Test Statistics	*F*=**32.128**; *p*<**0.001**		*F*=3.188; *p*=0.076			
Group effect: *F*=11.523; *p*=0.001 Measurement effect: *F*=14.516; *p*<0.001 Group X Measurement effect: *F*=0.258;*p*=0.612						

Superscripts a and b show the difference between groups in each measurement. Groups with the same letters are similar

DISCUSSION

This study shows the distress and risk perception experienced by pregnant women before and during the COVID-19 outbreak. Although pregnancy is a period of anxiety for many women even in normal times when there is no pandemia, concerns and anxiety scores of pregnant women about their pregnancies have increased with the COVID-19 outbreak. In studies conducted before the Covid-19 period, the NuPDQ-total mean score of pregnant women was determined as 10.26±5.18, 11.63±6.40 in different studies (22,23). In a study conducted during the Covid period, the mean NuPDQ-total score of pregnant women was found to high 12.06±5.85 similar to our study (24). Similarly, in a previous study, it was reported that pregnant women experienced high depression levels, general anxiety, and pregnancy-specific anxiety symptoms during the pandemia process (11).

In the present study, the distress level was found to increase as the perception risk increased in pregnancy. Also, it was found that the risk perception increased as the age of the pregnant women increased. As age increases, women might become more conscious about health risks, especially during pregnancy. It was reported in another study that there was a high risk of developing anxiety due to COVID-19 in pregnant women under the age of 35 (17).

Parity is one of the factors that might be related closely to anxiety symptoms during pregnancy. Because women who will be mothers for the first time tend to face more anxiety than women who have been mothers before (11,25). However, in the present study of ours, the risk perception scores of those whose number of pregnancies was 1 in both measurements were statistically lower than in other groups. It was also determined that pregnant women who had living children felt more risk before and during the pandemia than those who had no children at all, and this risk perception score increased at significant levels during the pandemia.

In the present study, prenatal distress and risk perception scores of the pregnant women about themselves/their baby were found to be higher in pregnant women who had high educational levels. As educational level increases, the perceived risk also increases in pregnant women. It was determined that women with undergraduate and higher educational levels faced more distress in the pandemia process. These findings suggest that education is an important factor in the development of anxiety during pregnancy. In the study conducted by Mappa (26), the effect of education on anxiety was reported similarly. It may be argued that, as the level of education of women increases, the awareness on pregnancy and the risks that might develop also increase, and they experience more anxiety. Education might increase the sensitivity of individuals to events, especially in critical conditions like COVID-19 pandemia. Individuals who have low educational levels might not have any idea on pandemia, be less susceptible to the crisis caused by the pandemia, or even be unaware of the dimension of the crisis (27). Different from these findings, it was found in some previous studies that low educational levels were associated with high prevalence of anxiety and depression in pregnant women (10,28).

The distress scores of the working pregnant women were higher than those who did not work at statistically significant levels in the present study. It was especially determined that working pregnant women experienced serious concerns about baby care and postpartum process. It can be considered that the pregnant women experienced more anxiety because of reasons like inability to be isolated due to working conditions, working in risky environments, and having to start to work at the end of childbirth. Similarly, in a previous study, it was also found that full-time working pregnant women had a high risk of developing anxiety (17).

Income status is a factor affecting the lives of people, causing that they experience psychological problems, such as anxiety and depression regardless of pandemia process (29). There are many studies showing that depressive symptoms are more common in pregnancy and postpartum period, especially in women who have low socioeconomic status (16,30). Also, the pandemia process might increase the risk of anxiety because it can cause lower healthcare quality in low-income individuals. In our study, the anxiety that was experienced in the pandemia period by pregnant women who reported income status as poor was found to be higher than in other groups. In addition, the risk perception of these pregnant women regarding their pregnancies was also quite high both before the pandemia and during the pandemia period. Similarly, pregnant women who had low income levels were reported to be likely to experience depressive symptoms in the study conducted by Yanting Wu et al.(17)

It was reported in previous studies that there appeared more mortality and morbidity in those with chronic diseases with the Covid-19 outbreak (31,32). For this reason, in our study which was conducted with pregnant women with chronic diseases, it was observed that women experienced more anxiety both before pandemia and during pandemia, and their risk perception regarding their pregnancies increased.

It was found in our study that pregnant women generally had elevated concerns about healthcare quality and post-partum baby care during pandemia when compared to pre-pandemia period. The literature findings are similar to the results of the present study. It was reported in previous studies that pregnant women are concerned about going to the hospital for follow-ups, delaying prenatal care and prenatal hospitalization (7–9,33). It was reported that 41.9% of the pregnant women in Wuhan said that they refused to go to any hospital for the fear of infection; and 12.8% of the pregnant women said that they wanted to have a caesarean section instead of waiting for a hospital birth (8). It was reported in another studies that the anxiety of the pregnant women was associated with the fact that Covid-19 was perceived as a threat for the necessary prenatal care and social isolation during the pandemia process because of the threat to the life of the mother and the baby (7,11).

No other studies were detected in the literature comparing the anxiety and risk perceptions of pregnant women before and during the pandemia period. For this reason, the findings of the study are important.

There are some limitations to this study. The population is limited, so the results can only be generalized to this population; the data were based on self-reporting of the women and not observed by the researcher; and because this study was conducted based on volunteer participation, only women willing to participate completed the questionnaire. Another limitation was the collection of data online.

CONCLUSION

In this study; the differences between the first and second measurement values of the NuPDQ-Total score of the pregnant women were not statistically significant. Ancak, the distress score of working pregnant women is statistically higher than that of non-working pregnant women. In our study, it was seen that pregnant women with chronic diseases experienced more anxiety both before and during the pandemic and the risk perception towards their pregnancy increased. And also, it was found that as the perception of risk increased during pregnancy, the level of distress increased. As pregnant women's age and education level increase, prenatal distress and the risk perception of the pregnant woman towards herself/infant increase.

Increasing the awareness of pregnant women towards themselves and their babies is very important in improving maternal and neonatal health. In order to increase awareness, it is necessary to determine the perception of risk in pregnancy and to continue pregnancy follow-up with high awareness of women

during pregnancy, starting from the preconceptional period.

Considering the importance of maternal and newborn health in reflecting the positive health outcomes of society, it is thought that it will be important to address the stress factor in the treatment, care and counseling services to be offered to pregnant women by health professionals in extraordinary processes.

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Ethical Considerations

The present study was approved by the Hatay Mustafa Kemal University Scientific Research Ethics Committee (2020/08). In addition, written permission was obtained from the Ministry of Health. An electronic informed consent was presented on the first page of the online survey. The participants were electronically informed on the first page of the survey that they were volunteering to participate and that they could withdraw from the survey at any time.

Conflict of Interests

There are no conflicts of interest. All authors have seen and approved the manuscript.

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Author Contribution

Authors share equal contribution to this manuscript.

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