Pregnancy and birth planning during COVID-19: The effects of tele-education offered to pregnant women on prenatal distress and pregnancy-related anxiety

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ABSTRACT

Aim: This study aims to examine pregnancy and birth planning during COVID-19 and the effects of a tele-education offered to pregnant women for this planning process on prenatal distress and pregnancy-related anxiety.

Method: The population of this quasi-experimental study was composed of pregnant women who applied for the antenatal education class of a public hospital in the east of Turkey during their past prenatal follow-ups and wrote their contact details in the registration book to participate in group trainings. The sample of the study consisted of a total of 96 pregnant women, including 48 in the experiment and 48 in the control groups, who were selected using power analysis and non-probability random sampling method. The data were collected between April 22 and May 13, 2020 using a "Personal Information Form", the "Revised Prenatal Distress Questionnaire (NuPDQ)" and the "Pregnancy Related Anxiety Questionnaire-Revised 2 (PRAQ-R2)". An individual tele-education (interactive education and consultancy provided by phone calls, text message and digital education booklet) was provided to the pregnant women in the experiment group for one week. No intervention was administered to those in the control group. The data were statistically analyzed using descriptive statistics (frequency, percentage, mean, standard deviation, min-max values) and t-test in dependent and independent groups.

Results: The posttest NuPDQ total mean scores of pregnant women in the experiment and control groups were 8.75 ± 5.10 and 11.50 ± 4.91, respectively, whereby the difference between the groups was statistically significant (t=-2.689, p=0.008). Additionally, the difference between their mean scores on both PRAQ-R2 and its subscales of "fear of giving birth" and "worries of bearing a physically or mentally handicapped child" was statistically significant (p<0.05), where those in the experiment group had lower anxiety, fear of giving birth and worries of bearing a physically or mentally handicapped child.

Conclusion: The tele-education offered to the pregnant women for pregnancy and birth planning during COVID-19 decreased their prenatal distress and pregnancy-related anxiety.

Introduction

Coronaviruses are a family of viruses that has caused very serious infectious diseases (MERS-CoV and SARS-CoV) in previous periods. The new type of coronavirus infection (COVID-19) is known to have a zoonotic origin and be transmitted from person to person. This disease, which first appeared in China (Hubei-Wuhan) and has spread across the whole world in a very short time, affects all people's entire life negatively with its economic and psychological impacts (Ministry of Health, 2020; World Health Organization, 2020).

Studies are still ongoing to understand the effects of COVID-19 infection during pregnancy. The current data are limited, and there is

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no evidence that pregnant women are currently at a higher risk of developing COVID-19 disease than the general population. However, as they may be badly affected by some respiratory infections due to changes in their bodies and immune systems, it is important for pregnant women to take precautions to protect themselves during COVID-19 and promptly report possible symptoms (including fever, cough or difficulty in breathing) to healthcare professionals (World Health Organization, 2020).

There is a limited number of studies on COVID-19. Chen et al. conducted a retrospective study to examine the clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women without any illness, tested the amniotic fluid, cord blood, neonatal throat swab and breast milk samples taken from six of them for SARS-CoV-2, and they found that all samples that were tested were negative for the virus (Chen et al., 2020). Zhu et al. performed a retrospective study for clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia, and they reported that vertical transmission of 2019-nCoV is yet to be confirmed (Zhu et al., 2020). Additionally, it is still not confirmed whether the COVID-19 infection is likely to be transmitted to the baby via placental transmission or during childbirth (Zhu et al., 2020). For this reason, pregnant women may feel concerned about the probability of the infection to be transmitted to the fetus and be more open to anxiety (Taubman–Ben-Ari et al., 2020; Wu et al., 2020). For example, a study reported that pregnant women assessed after the declaration of the COVID-19 pandemic showed significantly higher depressive symptoms than those assessed before the declaration of the pandemic (Wu et al., 2020).

In this important process in which sufficient evidence is not available, all pregnant women, including those with confirmed or suspected COVID-19 infection, have the right to quality care before, during and after childbirth (Zhu et al., 2020). Additionally, the World Health Organization (WHO) emphasizes that all women have the right to a safe and positive childbirth experience whether or not they have a confirmed COVID-19 infection (World Health Organization, 2020). This includes all prenatal, intrapartum and postpartum maternal and neonatal care services, including psychological health services (Zhu et al., 2020). However, due to the potential risk of infection in processes such as a pandemic, pregnant women experience a dilemma in terms of applying to professional prenatal services (Wu et al., 2020). A study reported that pregnant women in Shanghai experienced severe concerns regarding the risk of COVID-19, they requested accelerated appointments for prenatal care, and their demands for online information regarding protection from COVID-19 and precautions to be taken were high (Du et al., 2020) . From this point of view, accurate and reliable sources of information may be provided through methods such us tele-education regarding the management of COVID-19 infections (Hong et al., 2020; Wu et al., 2020).

To our knowledge, there are no studies in which a tele-education was provided to pregnant women during a pandemic. On the other hand, it is emphasized in the literature that disasters and epidemics may lead to difficulties in provision of healthcare services, and in the COVID-19 pandemic process, tele-medicine practices including tele-education will be an effective method in allocating medical resources rationally (Hong et al., 2020). Moreover, Wu et al. reported that online antenatal care will be a good alternative for mothers requiring basic antenatal care and mental health consultation in the COVID-19 process (Wu et al., 2020). This study aimed to make pregnancy and birth planning during COVID-19 and examine the effects of a tele-education offered to pregnant women for this planning process on prenatal distress and pregnancy-related anxiety. The results of this study will contribute to the relevant literature and be a guide for the importance of evaluating pregnancy mental health in adverse situations such as pandemics.

Methods

Aim and type of study

This is a study with quasi-experimental design to determine the effects of tele-education offered to pregnant women about pregnancy and birth planning during COVID-19 on prenatal distress and pregnancy-related anxiety.

Research design and sample

The population of the study was composed of pregnant women who applied for the antenatal education class of a public hospital in the east of Turkey during their past prenatal follow-ups and wrote their contact details in the registration book to participate in group trainings. The data were collected between April 22 and May 13, 2020. The sample size was calculated to include a total of 96 pregnant women (48 in the experiment group, 48 in the control group) by performing a power analysis with a 5% level of significance, 95% confidence interval and 80% ability to represent the population and assuming that the tele-education would decrease the prenatal distress mean score of the pregnant women (9.4 ± 5.2) by three points (Tunçel and Süt, 2019). The pregnant women to be included in the groups were selected from the population using the random sampling method with an equal allocation ratio (1:1). The random assignment to the groups for an equal allocation ratio (1: 1) was performed by computer software (Arslan et al., 2019).

study inclusion criteria

All pregnant women who had internet access, were in their last trimester of pregnancy, had no psychiatric health issues and were not diagnosed with COVID 19 were included in the study. The COVID 19 diagnosis and psychiatric health issues were determined based on the pregnant women's declaration and medical history.

Data collection tools

The data were collected using the "Personal Information Form", the "Revised Prenatal Distress Questionnaire (NuPDQ)" and the "Pregnancy Related Anxiety Questionnaire-Revised 2 (PRAQ-R2)".

Personal information form

This form prepared by the researchers consisted of a total of 23 questions about the pregnant women's individual (age, education level, employment status, etc.) and obstetric (gestational week, baby's sex, total number of children, presence of health issues in current pregnancy, presence of previous miscarriage/abortion/stillbirth, type of delivery etc.) characteristics. This form was created by the researchers through Google Forms.

Revised prenatal distress questionnaire (NuPDQ)

The Prenatal Distress Questionnaire was developed by Yali and Lobel (1999) 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 (2008), increasing the number of items from 12 to 17. The Turkish validity and reliability study of the scale was performed by Yüksel et al. (2011) who reported that the Turkish version of the scale was an easily applicable, understandable, valid and reliable measurement tool to be used in measuring the levels of prenatal distress in all periods of pregnancy. A higher scale score indicates a higher level of prenatal distress. The scale has no cutoff score. The Cronbach's alpha internal consistency coefficient of the scale was reported as 0.85 (Yuksel et al., 2012).

Pregnancy related anxiety questionnaire-revised 2 (PRAQ-R2)

The Pregnancy Related Anxiety Questionnaire-Revised 2 (PRAQ-R2) was developed by van den Bergh (1990) and revised by Huizink et al. (2016) to be applied to all pregnant women regardless of parity. This scale consisting of 10 items is a 5-point Likert-type scale to question women's pregnancy-related anxiety levels (Van der Bergh, 1990; Huizink et al., 2016). The Turkish validity and reliability study of the scale was performed by Derya et al. (2018).

The Turkish version of the scale consists of 10 items for multiparous women and 11 items for primiparous women. The scale has three sub-scales, including "fear of giving birth (items 1, 2, 6 and 8)", "worries of bearing a physically or mentally handicapped child (items 4, 9, 10 and 11)" and "concerns about own appearance (items 3, 5 and 7)". The 8th item in the scale (I fear giving birth, because I have never experienced this before) is administered to only women who have not given birth before. The scale items are scored between 1 and 5 (1-Absolutely not relevant and 5-Very relevant). The lowest and highest scores are 11 and 55 for primiparous women, and 10 and 50 for multiparous women, respectively. A higher scale score indicates a higher level of anxiety in pregnancy. All scale items are scored positively. The scale has no cutoff score. The Cronbach's alpha coefficient of the scale was reported as 0.93 for multiparous women and 0.94 for primiparous women (Derya et al., 2018).

Data collection

The data were obtained using a mobile network system, in which pregnant women in the experiment and control groups who agreed to participate in the study were accessed separately. The pregnant women were assigned to the experiment and control groups with an equal allocation ratio (1:1). In the first telephone conversation with the pregnant women assigned to the experiment and control groups, information was given about the study. Firstly, the pregnant women who agreed to participate in the study were asked to complete the informed consent form designed in Google Forms. The data collection tools were sent to the pregnant women in the experiment group via the internet by using the Google Forms method, before they were provided with individual tele-education and consultancy service, which lasted for one week; thus, the pretest data were obtained. Their posttest data were obtained at the end of one week by using the same method. All data obtained through the online self-report method was saved through Google Forms. The pregnant women in the control group, who did not receive any intervention, were reached twice every other week, and their pre- and posttest data were obtained via the internet by using the Google Forms method. Data collection from each pregnant woman lasted around 5-10 minutes. Four pregnant women did not agree to participate in the study, and three pregnant women were excluded from the study because they wanted to leave during the education process. The telephone interviews continued until the sample size was reached.

Intervention

The tele-education offered to pregnant women consisted of interactive education and consultancy provided by phone calls, text messages and a digital education booklet. The tele-education offered to the pregnant women on pregnancy and birth planning during COVID-19 included educational topics such as general methods of protection from coronavirus, coronavirus prevention methods during pregnancy, coronavirus and delivery process, measures to be taken during the coronavirus pandemic and postpartum process, measures to be taken during the coronavirus pandemic and breastfeeding, and how to manage stress, anxiety and depression in these processes. The educational content was prepared in line with the suggestions of RCOG, ACOG, WHO, CDC, FIGO, ISUOG, RANZCOG and TJOD (International Society of Ultrasound in Obstetrics and Gynecology, 2020; Royal College of Obstetricians and

Gynaecologists ,2020; The American College of Obstetricians and Gynecologists ,2020; The BC Centre for Disease Control, 2020; The International Federation of Gynecology and Obstetrics, 2020; The Royal Australian and New Zealand College of Obstetricians and Gynaecologists 2020; Turkish Society of Obstetrics and Gynecology, 2020; World Health Organization, 2020).

The purpose of the study was explained to the pregnant women in the first conversation with them, and the necessary explanations were made regarding the tele-education for those who volunteered to participate. The timings of the next telephone conversations were decided upon with the pregnant women. The one-week education was given by the researchers by making a voice call at the most appropriate time for each pregnant woman and sending a text message every day. The tele-education and consultancy service provided to the pregnant women was also supported with a digital pdf file called the "Booklet for Pregnancy and Birth Planning Education during Coronavirus (COVID-19)". Although the educational contents provided via text messages and audio interviews included individual differences, the topics were presented based on the order in the booklet. The education was held in 5 sessions, each lasting around 15-20 minutes. Additionally, the pregnant women had an opportunity to contact the researchers via the mobile network whenever they wanted during the entire consultancy service and education program, and thus, all of their questions were answered within this period.

Research variables

Dependent variables: Pregnant women's scores on the prenatal distress and pregnancy-related anxiety scales

Independent variables: The tele-education on pregnancy and birth planning during COVID-19.

Control variables: Some of the pregnant women's individual (age, education level, employment status, etc.) and obstetric (gestational week, baby's sex, total number of children, presence of health issues in current pregnancy, presence of previous miscarriage/abortion/stillbirth, type of delivery etc.) characteristics.

Data analysis

The data were analyzed using the SPSS 20.0 package program and evaluated using descriptive statistics (frequency, percentage, mean, standard deviation, min-max values). Whether the data were suitable for normal distribution was evaluated with the Kolmogorov-Smirnov normality test. Additionally, paired-samples and independent-samples t-tests were used to determine the differences between the groups. The results were evaluated using a 95% confidence interval, which represents a significance level of 0.05 ($p<0.05$).

Ethical considerations

For conducting the study, an ethical approval was obtained from the Health Sciences Scientific Research and Publication Ethics Committee at Inonu University (Date: 21.04.2020, Decision No: 2020/645). Additionally, the Permission for Scientific Studies on COVID-19 was obtained from the Republic of Turkey Ministry of Health (Form code: 2020-05-01T14_54_28). All pregnant women were asked to sign an informed consent form using the Google Forms method before starting the research. After the posttest, the pregnant women in the control group were digitally sent the "Booklet for Pregnancy and Birth Planning Education during Coronavirus (COVID-19)".

Results

Table 1 compares the descriptive characteristics of the pregnant women in the experiment and control groups. When pregnant women in the experiment and control groups were compared in terms of their

Table 1

Comparison of the descriptive characteristics of the pregnant women in the experiment and control groups (n=96).

Descriptive Properties	Experiment (n=48) $\bar{X} \pm SD$		Control (n=48) $\bar{X} \pm SD$		Test and p value
Age (years)	28.70 ± 4.73		28.06 ± 4.12		t = 0.713 p = 0.478
Spouse's age (years)	32.70 ± 5.29		31.39 ± 4.38		t = 1.323 p = 0.189
Gestation period (week)	31.47 ± 3.92		31.12 ± 4.16		t = 0.429 p = 0.669
	n	%	n	%	
Educational level					
Literate-primary school	3	6.3	7	14.6	X^2= 3.549p= 0.314
Middle school	13	27.1	11	22.9	
High school	6	12.5	10	20.8	
University and above	26	54.2	20	41.7	
Working status					
Yes	16	33.3	14	29.2	X^2= 0.194 p= 0.660
No	32	66.7	34	70.8	
Spouse training status					
Literate-primary school	2	4.2	5	10.4	
Middle school	7	14.6	9	18.8	X^2=1.898
High school	19	39.6	16	33.3	p=0.594
University and above	20	41.7	18	37.5	
Spouse Working Status					
Working	47	97.9	45	93.8	X^2=1.043
Not working	1	2.1	3	6.2	p=0.307
Economic situation					
Income more than expenses	13	27.1	5	10.4	
Income and expense equivalent	25	52.1	30	62.5	X^2=4.401
Income less than expenses	10	20.8	13	27.1	p=0.111
Family structure					
Nuclear Family	39	81.3	44	91.7	X^2=2.224
Traditional Family	9	18.8	4	8.3	p= 0.136
Relationship with the spouse					
Very positive	27	56.3	26	54.2	
Positive	18	37.5	19	39.6	X^2=1.246
Neither positive nor negative	2	4.2	3	6.3	p= 0.742
Negative	1	2.1	0	0.0	
Relationship with family and environment					
Very positive	19	39.6	26	54.2	
Positive	28	58.3	19	39.6	X^2=3.812
Neither positive nor negative	1	2.1	3	6.3	p= 0.149

t: Independent-samples t-test X^2: Pearson's Chi-Squared Test.

introductory characteristics such as age, husband's age, gestational age, educational level, employment status, husband's educational level, husband's employment status, income level, type of family, relationship with husband and relationship with family and social circle, there was no statistically significant difference between the groups (p> 0.05, Table 1), suggesting that both groups had similar introductory characteristics.

When the pregnant women in the experiment and control groups were compared in terms of their obstetric characteristics such as total number of pregnancies, baby's sex, desired/planned pregnancy status, planned type of delivery, status of change in type of delivery due to COVID-19 and status of being informed about COVID-19 during pregnancy, there was no statistically significant difference between the groups (p> 0.05, Table 2), suggesting that both groups had similar obstetric characteristics.

Table 3 presents the distribution of the pregnant women's pretest and posttest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores. The lowest and highest NuPDQ scores were 0 and 34, respectively. The pretest and posttest NuPDQ total mean scores of all pregnant women in this study were 12.06±5.85 and 10.12±5.17, respectively. In this study, for NuPDQ, the pretest and posttest Cronbach's alpha coefficients were found as 0.84 and 0.82, respectively.

The lowest and highest PRAQ-R2 scores were 10 and 55, respectively. The pretest and posttest PRAQ-R2 total mean scores of all pregnant women in this study were 29.18±9.19 and 27.14±7.48, respectively. Additionally, the pretest and posttest PRAQ-R2 subscale mean scores of all pregnant women in this study were 11.66±4.62

and 11.00±4.18 for "fear of giving birth", 10.51±4.45 and 8.65±4.01 for "worries of bearing a physically or mentally handicapped child" and 7.01±2.73 and 7.48±1.97 for "concerns about own appearance", respectively. In this study, for PRAQ-R2, the pretest and posttest Cronbach's alpha coefficients were found as 0.87 and 0.89, respectively.

Table 4 presents the intra- and inter-group comparisons of the pretest and posttest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the experiment and control groups.

When the pretest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the in the experiment and control groups were compared, there was no statistically significant difference between the groups (p> 0.05), suggesting that they had similar levels of prenatal distress and pregnancy anxiety before the tele-education.

When the posttest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the experiment and control groups were compared, the posttest NuPDQ total mean scores of the pregnant women in the in the experiment and control groups were 8.75±5.10 and 11.50±4.91, respectively, suggesting a statistically significant difference between the groups (t=-2.689, p= 0.008). The posttest PRAQ-R2 total mean scores of the pregnant women in the experiment and control groups were 24.25±4.90 and 30.04±8.48, respectively, suggesting a statistically significant difference between the groups (t= -4.095, p= 0.000).

The posttest PRAQ-R2 "fear of giving birth" subscale mean scores of the pregnant women in the experiment and control groups were

Table 2
Comparison of the obstetric characteristics of the pregnant women in the experiment and control groups (n=96).

Obstetric Properties	Experiment (n=48) Frequency	%	Control (n=48) Frequency	%	Test and p value
Total number of pregnancies					
First pregnancy	23	47.9	29	60.4	X^2= 1.510 p= 0.219
2nd pregnancy or above	25	52.1	19	39.6	
Baby's sex					
Girl	22	45.8	21	43.8	X^2=0.307
Male	23	47.9	25	52.1	p=0.858
Unknown	3	6.3	2	4.2	
Desired/planned pregnancy status					
Yes	44	91.7	42	87.5	X^2=0.447
No	4	8.3	6	12.5	p=0.504
Planned type of delivery					
Normal birth	36	75.0	33	68.8	X^2= 0.464 p= 0.496
Cesarean	12	25.0	15	31.2	
Status of change in type of delivery due to COVID-19					
Yes	6	12.5	3	6.3	X^2=1.103
No	42	87.5	45	93.8	p=0.294
Status of being informed about COVID-19 during pregnancy					
Yes	28	58.3	20	41.7	X^2=0.169 p=0.681
No	20	41.7	22	45.8	

X^2: Pearson's Chi-Squared Test

Table 3
Distribution of the Pregnant Women's Pretest and Posttest NuPDQ Total, PRAQ-R2 Total and PRAQ-R2 Subscales Mean Scores (n=96).

Scales	Pretest Min-Max	$\bar{X} \pm SD$	Posttest Min-Max	$\bar{X} \pm SD$
NuPDQ total	0-29	12.06±5.85	0-25	10.12±5.17
PRAQ-R2 total	10-51	29.18±9.19	10-44	27.14±7.48
PRAQ-R2 Subscales				
Fear of giving birth	3-20	11.66±4.62	3-19	11.00±4.18
Worries about bearing a handicapped child	4-20	10.51±4.45	4-19	8.65±4.01
Concern about one's own appearance	3-14	7.01±2.73	3-12	7.48±1.97

Table 4
Intra- and inter-group comparisons of the pretest and posttest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the in the experiment and control groups.

Scales	Experiment (n=48) $\bar{X} \pm SD$	Control (n=48) $\bar{X} \pm SD$	[a]Test and p value
NuPDQ total Pretest	12.18±6.54	11.93±5.14	t= 0.208 p= 0.836
Posttest	8.75±5.10	11.50±4.91	t= -2.689 p= 0.008[c]
[b] Test and p value	t= 4.444 p=0.000[d]	t= 0.818 p= 0.418	
PRAQ-R2 total Pretest	29.29±9.96	29.08±8.46	t= 0.110 p= 0.912
Posttest	24.25±4.90	30.04±8.48	t= -4.095 p= 0.000[d]
[b]Test and p value	t= 4.366 p=0.000[d]	t= -1.292 p=0.203	
PRAQ-R2 Subscales			
Fear of giving birth			t= 0.132 p= 0.895
Pretest	11.72±4.79	11.60±4.49	
			t= -3.275 p= 0.001[c]
Posttest	9.66±3.52	12.33±4.40	
[b]Test and p value	t= 4.720 p=0.000[d]	t= -2.079 p=0.043[c]	
Worries about bearing a handicapped child			t= 0.068 p= 0.946
Pretest	10.54±5.01	10.47±3.87	
			t= -4.354 p= 0.000[d]
Posttest	7.02±2.70	10.29±4.44	
[b]Test and p value	t= 4.796 p=0.000[d]	t= 0.447 p=0.657	
Concern about one's own appearance			t= 0.037 p= 0.971
Pretest	7.02±2.90	7.00±2.59	
			t= 0.360 p= 0.719
Posttest	7.56±1.80	7.41±2.14	
[b]Test and p value	t= -1.148 p=0.257	t= -1.268 p=0.211	

[a] Independent-samples t-test [b]Paired-samples t-test [c]p<0.05 [d]p<0.001

9.66±3.52 and 12.33±4.40, respectively, suggesting a statistically significant difference between the groups (t= -3.275, p= 0.001).

The posttest PRAQ-R2 "worries of bearing a physically or mentally handicapped child" subscale mean scores of the pregnant women in the experiment and control groups were 7.02±2.70 and 10.29±4.44, respectively, suggesting a statistically significant difference between the groups (t= -4.354, p= 0.000).

The posttest PRAQ-R2 "concerns about own appearance" subscale mean scores of the pregnant women in the experiment and control groups were 7.56±1.80 and 7.41±2.14, respectively, suggesting no statistically significant difference between the groups (t= 0.360, p= 0.719).

When the intragroup comparisons of the pre- and posttest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the experiment group were examined, their pretest prenatal distress, fear of giving birth, worries of bearing a physically or mentally handicapped child and pregnancy-related anxiety total mean scores were significantly lower than their posttest mean scores (p <0.05).

When the intragroup comparisons of the pre- and posttest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the control group were examined, only their pretest fear of giving birth subscale mean score was significantly lower than their posttest mean score (p<0.05).

Discussion

The increasing spread of COVID-19 infection has turned into one of the most serious public health issues affecting the entire world (Barišić, 2020). Pregnancy is an important process in which women experience physiological, psychological, hormonal and social changes, increasing their risk of psychiatric discomfort (Silva et al., 2017). Lifestyle changes due to COVID-19 infection cause a psychological burden on pregnant women who face more worries and uncertainties than ever during pregnancy (Antonakou, 2020). The results of this study, which was conducted to determine the effects of tele-education offered to pregnant women about pregnancy and delivery planning during COVID-19 on prenatal distress and pregnancy-related anxiety are discussed here in line with the relevant literature.

This study found no statistically significant difference between the pregnant women in the experiment and control groups in terms of their introductory characteristics (age, education level, employment status, etc.) and obstetric characteristics (number of pregnancies, baby's sex, planned pregnancy, etc.) (Table 1 and 2). These results suggested that the groups were distributed homogeneously. Additionally, this study determined no statistically significant difference between the pretest NuPDQ total, PRAQ-R2 total and PRAQ-R2 subscales mean scores of the pregnant women in the experiment and control groups (Table 4). These results also suggested that the pregnant women in the experiment and control groups had similar levels of prenatal distress and pregnancy anxiety before the tele-education.

The COVID-19 pandemic has quickly changed daily life routines across the world (Antonakou, 2020). Life changes during pregnancy are some of the leading sources of stress (Busari, 2018). Pregnant women may be affected due to the unpredictability and restrictions of the pandemic (Durankuş and Aksu, 2020). Studies have emphasized that high stress levels may cause negative pregnancy outcomes, and therefore, stress management is important during pregnancy (Abdi et al., 2018; Pais and Pai, 2018). Additionally, social isolation and social distance practices due to COVID-19 infection may affect the social support status of pregnant women during pregnancy. Therefore, it is extremely important for midwives and healthcare professionals to provide guidance and support to women during pregnancy and childbirth (Antonakou, 2020). In this study, in comparison to the mean score of those in the control group, the posttest prenatal distress mean score of the pregnant women in the experiment group decreased significantly after they received the tele-education on pregnancy and birth planning during COVID-19 (Table 4, p <0.05). Furthermore, the intragroup posttest prenatal dis-

tress mean score of pregnant women in the experiment group decreased significantly compared to their pretest mean score (Table 4, p <0.001). These results show that the tele-education was effective in decreasing the prenatal distress levels of the pregnant women.

Studies have reported that the COVID-19 pandemic is a risk factor associated with increased anxiety in pregnant women. Educational interventions in the prenatal period are effective in preventing or reducing prenatal anxiety (Kang et al., 2016). This study found that the pregnant women who received the tele-education on pregnancy and birth planning during COVID-19 had a significantly lower posttest PRAQ-R2 mean score than those who did not (Table 4, p <0.001). Studies have reported that false information about COVID-19 increases the fear and anxiety of pregnant women, whereas correct information about COVID-19 has a positive effect on their anxiety levels during pregnancy (Corbett et al., 2020). The decreased level of anxiety in pregnant women due to the tele-education on pregnancy and birth planning during COVID-19 in this study was consistent with those in the literature. Durankuş et and Aksu (2020) evaluated the effects of the COVID-19 pandemic on anxiety and depression symptoms in pregnant women by using different measurement tools, and they determined that the anxiety levels of pregnant women with a high risk of developing postpartum depression were significantly higher (Durankuş and Aksu, 2020). This indicates that the COVID-19 pandemic is a risk factor for both the prenatal and postnatal periods. Additionally, acceptance of pregnancy anxiety as one of the most important risk factors and determinants of postpartum anxiety and depression increases the importance given to the subject in the literature (Derya et al., 2018; Lefkovics et al., 2018; Nakić Radoš et al., 2018; Silva et al., 2017; Sinesi et al., 2019).

Fear of giving birth is one of the best indicators of pregnancy-specific anxiety (Sinesi et al., 2019). Fear of childbirth may also affect the preference of pregnant women for type of delivery (Matinnia et al., 2015; Nilsson et al., 2018). Although COVID-19 infection is not a contraindication for vaginal delivery alone, infected women may prefer cesarean delivery due to their perception of childbirth, fear of giving birth, complications associated with labor and fear of disease transmission (Vivilaki and Asimaki, 2020). Studies have reported that an education given in the antenatal period is effective in reducing the fear of childbirth in pregnant women (Gökçe İsbir et al., 2016; Karabulut et al., 2016). In this study, the pregnant women who received the tele-education on pregnancy and birth planning during COVID-19 had a significantly lower posttest PRAQ-R2 "fear of giving birth" subscale mean score than those who did not. Additionally, the posttest PRAQ-R2 "fear of giving birth" subscale mean score of the pregnant women who did not receive the education significantly increased in comparison to their pretest mean score. These results showed that the educational intervention associated with COVID-19 was not only effective in reducing the pregnant women's fear of giving birth, but it also prevented the increase in fear of childbirth over time. One study on pregnant women's fear of labor in the antenatal period found that pregnant women were most concerned about the health of their babies (Geissbuehler and Eberhard, 2002). Studies have also reported that pregnant women were mostly concerned about their elderly relatives, children and unborn babies during the COVID-19 pandemic, respectively (Corbett et al., 2020). In this study, the pregnant women who received the tele-education on pregnancy and birth planning during COVID-19 had a significantly lower posttest PRAQ-R2 "worries of bearing a physically or mentally handicapped child" subscale mean score than those who did not. This result suggested that the education was effective in reducing the fears of the pregnant women about their babies' health.

Conclusion and recommendations

The tele-education offered to the pregnant women on pregnancy and birth planning during COVID-19 decreased their prenatal distress and anxiety levels. Pregnancy is a critical period in which women are at risk of developing stress and anxiety disorders. Therefore, it is recom-

mended to screen every pregnant woman in the prenatal period in terms of stress and anxiety and plan appropriate care for those at risk. Additionally, educational contents about pregnancy and birth planning during COVID-19 should be included in antenatal care training contents to reduce the negative effects of the COVID-19 pandemic, which affects the whole world, on pregnant women.

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Declaration of Competing Interest

CRediT authorship contribution statement

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