

Pregnancy During the COVID-19 Pandemic: Attachment and Well-Being During Pregnancy

COVID-19 Pandemi Sürecinde Gebelik: Bağlanma ve Gebelikte İyilik

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Abstract

Objective: This study was conducted to investigate the maternal-fetal attachment and well-being of pregnant women during the COVID-19 pandemic.

Methods: This cross-sectional study was conducted on 401 pregnant women using a web-based survey. Data were collected using an Introductory Information Form, the Maternal Antenatal Attachment Scale (MAAS) and the Well-being in Pregnancy (WiP) Scale. Hierarchical regression analysis was performed to determine the predictors of WiP and MAAS.

Results: The MASS total score average was 70.57 ± 7.86 (range 46–88), and the WiP total score average was 53.84 ± 8.93 (range 32–72). In the regression model, education level, planned pregnancy, number of living children, gender of the fetus, working status of the spouse and WiP variables were the predictors of maternal-fetal attachment. The predictors of WiP were found to be the presence of symptoms similar to COVID-19, planned pregnancy, working status of the spouse, gestational week and maternal-fetal attachment.

Conclusions: This study provides initial insight into the attachment and well-being levels of pregnant women during the COVID-19 pandemic. The results may inform future interventions to support pregnant women during pandemics.

Keywords: Coronavirus, COVID-19, attachment, well-being, pregnancy

Özet

Amaç: Bu çalışma, COVID-19 pandemisi sürecinde gebelerin maternal-fetal bağlanması ve gebelikte iyilik halini araştırmak için yapılmıştır.

Yöntem: Kesitsel tipte olan araştırma, web tabanlı bir anket kullanılarak 401 gebe kadın üzerinde gerçekleştirildi. Veriler Kişisel Bilgi Formu, Doğum Öncesi Anne Bağlanma Ölçeği (DÖABÖ) ve Gebelikte İyilik Hali Ölçeği (GİHÖ) kullanılarak toplanmıştır. Doğum Öncesi Anne Bağlanma ve Gebelikte İyilik Hali Ölçeği'nin yordayıcılarını belirlemek için hiyerarşik regresyon analizi yapıldı.

Bulgular: Doğum Öncesi Anne Bağlanma Ölçeği toplam puan ortalaması 70.57 ± 7.86 (aralık 46-88) ve Gebelikte İyilik Hali Ölçeği toplam puan ortalaması 53.84 ± 8.93 (aralık 32-72) idi. Regresyon modelinde eğitim düzeyi, gebeliğin planlı olması, yaşayan çocuk sayısı, fetüsün cinsiyeti, eşin çalışma durumu ve Gebelikte İyilik Hali Ölçeği değişkenleri maternal-fetal bağlanmanın yordayıcıları olarak belirlendi. Gebelikte İyilik Hali Ölçeği'nin yordayıcıları; COVID-19 semptomlarına benzer semptomların varlığı, gebeliğin planlı olması, eşin çalışma durumu, gebelik haftası ve maternal-fetal bağlanma olarak belirlendi.

Sonuç: Bu çalışma, COVID-19 pandemisi sırasında gebe kadınların bağlanma ve gebelikte iyilik düzeylerine ilişkin öngörü sağlar. Sonuçlar, pandemi sırasında gebe kadınları desteklemek için gelecekteki müdahaleler hakkında bilgi sağlayabilir.

Anahtar Kelimeler: Koronavirüs, COVID-19, bağlanma, iyilik, gebelik

INTRODUCTION

Coronavirus disease 2019 (COVID-19), is a highly contagious but also fatal pneumonia-type disease that spread to many people from Wuhan City in China at the end of 2019. The World Health Organization (WHO) has declared COVID-19 a public health emergency and a pandemic of international importance (Zhu et al.,

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2020; Huang et al., 2020). Many cases and deaths have been reported in 216 countries around the world, with Europe being the centre. As of January 30, 2021, nearly 85 million cases and 2 million deaths have been reported. In Turkey, about 2 million cases and 21,295 deaths have been recorded (JHU CSSE, 2020). Among these cases, 87% were between the ages of 30 and 79, and the common symptoms were respiratory symptoms, fever, cough and dyspnoea (Chen et al., 2020). In severe cases, pneumonia, severe acute respiratory infection, renal failure and even death may develop (Dashraath et al., 2020; Zhang et al., 2020). Pregnancy is a partial immunosuppressive state that makes pregnant women more vulnerable to viral infections, and even with seasonal flu, morbidity is higher in pregnant women (Liang & Acharya, 2020). Infection of pregnant women with respiratory viruses due to physiological changes in the immune and cardiopulmonary systems brings the risk of developing more severe diseases (Chen et al., 2020; Liang & Acharya, 2020).

Although there is limited data about the course of COVID-19 in pregnancy, according to the information available to date, there is no serious risk of disease or a significant risk for the newborn at the end of pregnancy (UNFPA, 2020). Pregnancy experienced in uncertainty during the COVID-19 pandemic causes anxiety and stress in women and may affect their well-being and psychosocial health during pregnancy (Haakstad, Torset, & Kari 2016; Mappa, Distefano, & Rizzo, 2020). However, positive emotions and thoughts during pregnancy are of great importance in providing physical health and maternity care focused on the positive aspects of pregnancy (Dolatian, Mahmoodi, Dilgony, Shams, & Zaeri, 2017). In fact, when a woman responds positively to pregnancy, her attachment to the baby begins. The expectant mother who feels her pregnancy to be at risk may experience fear of losing her baby. A mother's affectionate attachment to her baby is one of the most important elements that ensure the healthy growth and development of the baby, positively affecting its entire life. Healthy communication between mother and baby ensures the healthy personality development of the baby in the future and provides the basis for establishing positive relationships with others (Chen et al., 2020; Liang & Acharya, 2020; Dolatian et al., 2017). The maternal attachment process, which has been accepted to start during pregnancy in recent years, may be affected because of the uncertainties brought about by the COVID-19 pandemic (Chen et al., 2020; Küçükkaya, Süt, Öz, & Sarıkaya, 2020).

More information is needed on the effects of the COVID-19 pandemic, which affects all countries of the world, but of which we have limited information on pregnant women. This study aimed to examine the attachment and well-being levels experienced by pregnant women during the COVID-19 pandemic and to contribute to the relevant literature.

MATERIALS AND METHODS

This cross-sectional study was conducted in a public hospital in the east of Turkey. The sample of the study was composed of pregnant women who applied to the prenatal education class during their previous prenatal follow-ups and whose contact information was recorded. OpenEpi version 3 statistics software, which is open for general use, was used to calculate the sample size (<http://www.openepi.com>). In the power analysis, the

sample size was calculated as 384 with a 5% margin of error, 95% confidence interval, 0.80 power of representation and two-way significance level. A total of 401 pregnant women who voluntarily participated in the study were included in the study. All pregnant women who were 18 years and older, had internet access and had no pregnancy complications or diagnosed neurological or psychiatric disorders were included in the study. The study questionnaires were conducted using the Google Forms application (<https://docs.google.com/forms>) and via a web-based online survey through pregnancy groups on Facebook and Instagram. Data were collected from pregnant women using an Introductory Information Form, the Maternal Antenatal Attachment Scale (MAAS) and the Well-being in Pregnancy (WiP) Scale. Questionnaires were filled in personally by the pregnant women online between July 2020 and September 2020.

Data Collection Tools

Introductory Information Form: This form was prepared by the researchers to determine the sociodemographics (e.g. age, education level, employment status, income level, family type) and obstetric characteristics (e.g. parity, desire for pregnancy, and number of living children) of the pregnant women and information about COVID-19 (e.g. being in contact, getting a diagnosis).

Maternal Antenatal Attachment Scale (MAAS): The scale was developed by Condon (1993), and its Turkish validity and reliability study was conducted by Gölbaşı et al. (2015). Each item of the scale focuses on the feelings, attitudes and behaviours of pregnant women towards the fetus. Each item in the five-point Likert scale is scored 1–5 (5 = very strong feelings towards the fetus; 1 = absence of feelings towards the fetus). A high score indicates a high degree of attachment. MAAS has two subscales: quality of attachment (3, 6, 9, 10, 11, 12, 13, 15, 16, and 19) and time spent on attachment (1, 2, 4, 5, 8, 14, 17, and 18). Item seven does not influence any factor of these sub-dimensions; it is added to the total score. The reliability of the scale (Cronbach's alpha) is 0.79 (Golbasi, Ucar, & Tugut, 2015). We found this value to be 0.73 in our study.

Well-being in Pregnancy (WiP): This scale was developed by Alderdice et al. (2017) and adapted into Turkish by Sunay et al. (2020). WiP describes the characteristics of the pregnancy well-being measure, and the general well-being provides women with the opportunity to express their positive and negative feelings and thoughts about their pregnancy, reflecting their overall well-being. The scale is a six-point Likert-type scale, and the responses to the items are '1 = always', '2 = most of the time', '3 = more than half of my time', '4 = less than half of my time', '5 = sometimes', and '6 = never'. The increase in the mean score obtained from the scale indicates that well-being during pregnancy increases. WiP consists of 12 items and has two subscales: 1) positive effect and satisfaction and 2) concerns. The positive effect and satisfaction subscale consists of seven items (items 1, 2, 3, 5, 7, 11 and 12), and higher scores indicate higher positive emotions, positive relationships and satisfaction with pregnancy and care. The concerns sub-scale consists of five items (items 4, 6, 8, 9 and 10), and higher scores indicate fewer concerns. Five items (items 4, 6, 8, 9 and 10)

belonging to the worries subscale are calculated by reversing them. The reliability of the scale (Cronbach's alpha) is 0.72 (Sunay et al., 2020). This value was found to be 0.68 in our study.

Data Analysis

The study data were analysed using the Statistical Package for the Social Sciences version 25.0 for Windows software (SPSS, Chicago, IL, USA). The demographic and obstetric characteristics were expressed as numbers, percentages, means and standard deviations. The MAAS and WiP scores that were continuous and normally distributed were expressed as means and standard deviations. Independent-samples t-tests, Mann-Whitney U test and one-way analysis of variance were used to compare the MAAS and WiP scores according to the independent variables. Tukey's test was used to determine the difference between the groups. Correlation analysis was performed to examine the relationships between MAAS, WiP and the independent variables. Hierarchical regression analysis was used to model the relationship between the scales (MAAS and WiP) and the independent variables (demographic and obstetric characteristics). In determining the variables to be included in the regression models, those with a significant relationship with MAAS and WiP ($p < 0.05$) were added to the model. Statistical significance was accepted as $p < .05$.

Ethical Considerations

Research approval was obtained from the Health Sciences Scientific Research and Publication ethics committee and approved by the scientific committee (Decision no: 2020/926). The pregnant women were informed about the study and notified that their personal data would be kept confidential.

RESULTS

A total of 401 pregnant women participated in the study. The distribution of pregnant women according to their introductory characteristics is given in Table 1. The average age of the pregnant women included in the study was 27.56 ± 4.76 (range 18–44). Among the pregnant women, 54.9% were university graduates, 64.3% did not work, 84.8% had planned pregnancy and 35.7% expected a baby girl (Table 1).

The comparison of the mean scores obtained from MAAS and WiP according to their introductory characteristics is given in Table 2. In the comparison of the mean scores of the pregnant women from MAAS according to education level, employment status, working status of the spouse, smoking status, planned pregnancy and sex of the expected baby, a statistically significant difference was found between the groups ($p < .05$). In the comparison of the mean scores from WiP, a statistically significant difference was found between the groups according to the working status of the spouse, planned pregnancy, gender of the expected baby and presence of COVID-19 symptoms ($p < .05$).

Table 1. Demographic and Obstetric Characteristics of the Pregnant Women (N=401)

Variables	n	%
Age (y) (mean $\pm$ SD, 27.56 $\pm$ 4.76)		
Educational level		
Primary school	32	8.0
Secondary school	63	15.7
High school	86	21.4
University	220	54.9
Employment status		
Yes	143	35.7
No	258	64.3
Spouse's employment status		
Employed	374	93.3
Unemployed	27	6.7
Planned pregnancy		
Yes	340	84.8
No	61	15.2
Gender of fetus		
Girl	143	35.7
Boy	130	32.4
Unknown	128	31.9

SD: Standart Deviation

Table 2. Comparison of the Mean Scores Obtained from Maternal-Fetal Attachment Scale and Well-Being in Pregnancy Scale According to the Characteristics of the Pregnant Women (N=401)

Variables	n	MAAS Mean $\pm$ SD	Test	WiP Mean $\pm$ SD	Test
Educational level					
Primary school ^a	32	66.90 $\pm$ 9.09	F=12.603	53.87 $\pm$ 8.31	F=0.568
Secondary school ^b	63	66.80 $\pm$ 7.46	P<0.001	52.52 $\pm$ 8.77	P=0.636
High school ^c	86	69.86 $\pm$ 7.04	d >a=b=c	53.94 $\pm$ 10.05	
University ^d	220	72.46 $\pm$ 7.51		54.18 $\pm$ 8.62	
Employment status					
Yes	143	72.30 $\pm$ 7.18	t=3.327	53.79 $\pm$ 8.61	t= -0.096
No	258	69.61 $\pm$ 8.07	P<0.001	53.87 $\pm$ 9.12	p= 0.922
Spouse's employment status					
Yes	374	70.87 $\pm$ 7.82	U=3298.0	54.14 $\pm$ 8.86	U=3663.0
No	27	66.33 $\pm$ 7.36	P=0.003	49.66 $\pm$ 8.92	P=0.017
Smoking					
Yes	27	67.96 $\pm$ 7.86	U= -1.750	51.37 $\pm$ 7.44	U= -1.404
No	374	70.76 $\pm$ 7.84	P=0.008	54.02 $\pm$ 9.01	P=0.160
Planned pregnancy					
Yes	340	71.37 $\pm$ 7.53	t=4.677	54.37 $\pm$ 8.80	t=2.822
No	61	66.09 $\pm$ 8.21	P<0.001	50.90 $\pm$ 9.15	P<0.005
Gender of fetus					
Girl ^a	143	71.35 $\pm$ 8.25	F=7.804	54.09 $\pm$ 8.98	F=3.558
Boy ^b	130	71.88 $\pm$ 7.03	P<0.001	55.15 $\pm$ 8.89	P=0.029
Unknown ^c	128	68.36 $\pm$ 7.81	a=b>c	52.24 $\pm$ 8.73	a=b>c
Presence of Covid-like symptoms*					
Yes	88	70.72 $\pm$ 8.78	t=0.207	51.31 $\pm$ 7.81	t=-3.038
No	313	70.53 $\pm$ 7.60	P=0.836	54.55 $\pm$ 9.10	P=0.001
Presence of Covid contact					
Yes	25	50.88 $\pm$ 6.96	U=4675	70.68 $\pm$ 6.32	U=3609.0
No	376	54.04 $\pm$ 9.02	P=0.965	70.56 $\pm$ 7.96	P=0.052

* COVID-19 was negative during pregnancy and complaints such as fever, cough, respiratory distress, and myalgia were questioned. SD: Standart Deviation; MAAS: Maternal-Fetal Attachment Scale; WiP: Well-being in Pregnancy

Table 3 presents the correlation between MAAS, WiP and characteristics of the pregnant women. The mean MAAS total score of the pregnant women was 70.57 ± 7.86 (range 46–88), the mean score of the quality of attachment sub-dimension was 41.87 ± 3.98 (range 30–50) and the mean score of the time spent in attachment sub-dimension was 28.69 ± 5.11 (range 11–40). The WiP total score average of the pregnant women was 53.84 ± 8.93 (range 32–72), the mean score of the positive effect and satisfaction subscale was 33.90 ± 6.55 (range 13–42) and the mean score of the concerns subscale was 19.94 ± 6.21 (range 5–30). A significant negative correlation was found between MAAS and the number of pregnancies ($r = -.261$, $p < .01$). A weak positive correlation was observed between the week of gestation ($r = .135$, $p < .01$), number of living children ($r = .256$, $p < .01$) and the total and positive effect and satisfaction and concerns subscales of WiP ($r = .422$, $r = .324$ and $r = .264$, respectively; $p < .01$). A positive significant relationship was found between the WiP total score and the week of gestation and the MAAS total and quality of attachment and time spent in attachment sub-dimensions ($r = .108$, $r = .422$, $r = .423$ and $r = .319$, respectively; $p < .05$).

Table 3. Correlation Between MAAS, WiP and Characteristics of the Pregnant Women (N=401)

Variables	Mean± SD	MAAS	WiP
Age	27.56±4.76	$r = -.086$	$r = .022$
Gestational week	22.36±9.73	$r = .135^{**}$	$r = .108^*$
Number of pregnancy	1.55±0.49	$r = -.261^{**}$	$r = .048$
Number of children living	1.81±1.12	$r = .256^{**}$	$r = .008$
MAAS total	70.57±7.86	-	$r = .422^{**}$
Quality of attachment	41.87±3.98	$r = .823^{**}$	$r = .423^{**}$
Time spent in attachment	28.69±5.11	$r = .897^{**}$	$r = .319^{**}$
WiP Total	53.84±8.93	$r = .422^{**}$	-
Positive affect and satisfaction	33.90±6.55	$r = .324^{**}$	$r = .718^{**}$
Concerns	19.94±6.21	$r = .264^{**}$	$r = .679^{**}$

* $P < .05$; ** $P < .01$

SD: Standard Deviation

MAAS: Maternal-Fetal Attachment Scale

WiP: Well-being in Pregnancy

Table 4 shows the results of the regression analysis of the independent variables predicting MAAS and WiP. A stepwise regression analysis was used to determine the relationship between MAAS and WiP and the relationship between demographic and obstetric variables.

Table 4. Regression Analysis of the Role of Demographic and Obstetric Variables in Predicting the Maternal-Fetal Attachment and Well-Being in Pregnancy

MAAS						WiP					
Variables	B	SE	β	t	R ²	Variables	B	SE	β	t	R ²
Step I Educational level ^a	2.279	0.382	0.286	5.959**	.082*	Step I Presence of COVID-like symptoms ^e	3.241	1.067	0.150	3.038**	.023*
Step II Educational level ^a	2.010	0.380	0.252	5.284**	.120*	Step II Presence of COVID-like symptoms ^e	3.115	1.060	0.144	2.940**	.040*
Planned pregnancy ^b	-4.340	1.044	-0.198	-4.157**		Planned pregnancy ^b	-3.317	1.221	-0.134	-2.717**	
Step III Educational level ^a	1.675	0.390	0.210	4.291**	.142*	Step III Presence of COVID-like symptoms ^e	2.978	1.054	0.138	2.826**	.056*
Planned pregnancy ^b	-3.780	1.046	-0.173	-3.612**		Planned pregnancy ^b	-3.418	1.214	-0.138	-2.817**	
Number of children living	2.508	0.779	0.159	3.219**		Spouse's employment status ^d	-4.388	1.740	-0.123	-2.522**	
Step IV Educational level ^a	1.534	0.389	0.192	3.946**	.162*	Step IV Presence of COVID-like symptoms ^e	3.074	1.050	0.143	2.928**	.067*
Planned pregnancy ^b	-3.909	1.036	-0.179	-3.773**		Planned pregnancy ^b	-3.347	1.208	-0.135	-2.770**	
Number of children living	2.630	0.772	0.166	3.407**		Spouse's employment status ^d	-4.258	1.732	-0.120	-2.458**	
Gender of fetus ^c	-1.369	0.443	-0.143	-3.089**		Gestational week	0.098	0.045	0.107	2.192**	
Step V Educational level ^a	1.354	0.390	0.170	3.472**	.180*	Step V Presence of COVID-like symptoms ^e	3.278	0.968	0.152	3.387**	.210*
Planned pregnancy ^b	-4.036	1.027	-0.184	3.929**		Planned pregnancy ^b	-0.937	1.149	-0.038	-0.815	
Number of children living	2.804	0.767	0.177	3.656**		Spouse's employment status ^d	-2.137	1.616	-0.060	-1.322	
Gender of fetus ^c	-1.395	0.439	-0.146	3.177**		Gestational week	0.053	0.041	0.057	1.272	
Spouse's employment status ^d	-4.239	1.448	-0.135	2.927**		MAAS Total	0.452	0.053	0.398	8.444**	
Step VI Educational level ^a	1.364	0.171	0.171	3.818**	.314*						
Planned pregnancy ^b	-2.807	-0.128	-0.128	2.951**							
Number of children living	2.887	0.183	0.183	4.110**							
Gender of fetus ^c	-1.085	-0.113	-0.113	-2.686*							
Spouse's employment status ^d	-2.708	-0.086	-0.086	-2.025*							
WiP Total	0.330	0.374	0.374	8.773**							

* $p < .01$ ** $p < .001$ MAAS: Maternal-Fetal Attachment Scale WiP: Well-being in Pregnancy

^aEducation Level= 1:Primary school, 2:Secondary school, 3: High school, 4: University ^bPlanned pregnancy= 1: Planned, 2:Unplanned

^cGender of fetus= 1: Girl, 2: Boy, 3: Unknown ^dSpouse's employment status= 1:Yes, 2: No ^ePresence of COVID-like symptoms= 1:Yes, 2: No

In the first model of MAAS, educational level was found to be an important variable in predicting MAAS ($P < .01$). In the second step, the model established with the addition of planned pregnancy explained 12% of the variance in MAAS ($R^2 = .120$), and the new model was significant. In the third step, the model established by including the number of children living was significant and explained 14% of the model ($R^2 = .142$). In the fourth step, with the addition of fetus gender, the variance in MAAS explained by the model increased to 16% ($R^2 = .162$; $p < .01$). In the fifth step, with the addition of the spouse's employment status, the variance in MAAS explained by the model increased to 18% ($R^2 = .180$; $p < .01$), and the model was significant. In the sixth step, with the addition of WiP total, the variance in MASS explained by the model increased to 31% ($R^2 = .314$; $p < .01$), and the model was significant. The variables added to the model were found to be important in predicting MAAS, and the values related to the regression coefficient were statistically significant ($p < .01$).

A stepwise regression analysis was used to determine the relationship of WiP with the demographic and obstetric variables. In the first four steps, the presence of COVID-19-like symptoms, planned pregnancy, spouse's employment status and gestational week were found to be important variables in predicting WiP, and the values related to the regression coefficient were statistically significant ($R^2 = .023$, $R^2 = .040$, $R^2 = .056$ and $R^2 = .067$, respectively; $p < .01$). In the fifth step, with the addition of MAAS total, the variance in WiP explained by the model increased to 21%, and the model was significant ($R^2 = .210$; $p < .01$).

DISCUSSION

Our knowledge about how women experience and evaluate pregnancy and their well-being during pregnancy is limited. With this situation accompanied by the COVID-19 pandemic, how they perceive their pregnancy and their pregnancy well-being becomes even more unknown. Not only can COVID-19 affect health, but social isolation and quarantine can also affect the well-being of pregnant women and maternal–fetal attachment (Oskovi-Kaplan et al., 2020).

This study found that the mean scores of the MAAS total, quality of attachment and time spent in attachment sub-dimensions were higher than those in the studies conducted before the pandemic (O'Malley et al., 2020; Hopkins et al., 2018; Smorti et al., 2020; Matthias et al., 2020). Before the pandemic, maternal attachment was examined by another study in the same city as this study. The present study showed that the mean scores obtained from the maternal attachment total and sub-dimensions during pregnancy were half of those in the study of Karslıoğlu (2019). Given that the level of maternal attachment was nearly twice as high after the pandemic in a similar population, maternal–fetal attachment increased in Turkish women during the COVID-19 outbreak compared with the pre-pandemic period. This situation is considered caused by the uncertainty during the pandemic process and the psychology of trying to protect the baby more.

In this study, when the WiP total and sub-dimension mean scores were compared with the results of the study conducted before the pandemic, the well-being levels of pregnant women during the pandemic period were similar to those in previous studies (Alderdice et al., 2017; Bassi et al., 2017). Even during the pandemic period, the fact that the pregnant women we sampled were healthy and not diagnosed with COVID-19 could have caused the level of well-being to remain unchanged in the pandemic. In addition, the effects of COVID-19 on pregnancy have not been clarified yet, and when the available information is considered, a significant effect on pregnant women and the fetus has not been shown (Qiao, 2020). Despite the pandemic, women still felt positive feelings about pregnancy. Hierarchical regression analysis was performed to determine the relationship of MAAS and WiP with the demographic and obstetric variables. In this study, planned pregnancy was among the determinants of maternal–fetal attachment and well-being in pregnancy. Abasi et al. found that pregnancy planning is effective in attachment (Abasi, Tahmasebi, Zafari, & Takami, 2012). Hartnett and Brantley reported that desire for and planning of pregnancy affect well-being during pregnancy (Hartnett & Brantley, 2020). However, the COVID-19 pandemic caused couples not to plan and to delay pregnancy due to uncertainty and unpredictability (Tang et al., 2020). Therefore, the prevention of unplanned pregnancies in this period is also important in terms of attachment and well-being.

The COVID-19 pandemic caused economic narrowing and job loss worldwide (Bingül, Türk, & Ak, 2020). Moreover, in this study, the working status of the spouse was among the predictors of maternal–fetal attachment and well-being in pregnancy. The assessment of parents' sources of social and financial support also plays an important role in maintaining a high level of mother–fetus relationship (Fowlie & McHaffie, 2004). Parents whose basic needs, such as nutrition, shelter, transportation and social support, are not met have difficulties in adapting to their future babies (Shin, Park, & Kim, 2006). Having a new baby affects parents' financial responsibilities and requirements (Diener, 2009).

In the regression model, the education level of pregnant women was among the predictors of maternal–fetal attachment. Karabulutlu, Beydağ and Lazoğlu (2020) determined that an increase in the education level of pregnant women increases attachment in the east and west of Turkey (Karabulutlu et al., 2020). Likewise, Höbek Akarsu and Oksay (2017) and Çınar et al. (2017) reported a statistically significant relationship between education level and prenatal attachment, and the higher the education level, the higher the attachment score averages (Höbek Akarsu, & Oskay, 2017; Çınar et al., 2017). These findings show that the low education level of pregnant women is associated with a low level of attachment.

Other predictors of maternal–fetal attachment were the gender of the fetus and the number of living children. Bekmezci and Özkan (2016) found a significant relationship between knowing the gender of the baby and attachment and stated that mothers who knew the gender of their baby had higher attachment scores. Baltacı and Başer (2020) found a relationship between pregnancy attachment and nullipara, primipara, or multiparous pregnancy. These studies conducted before the pandemic showed that the fetus in the desired sex and having a living child were associated with fetal attachment.

Although the pregnant women were COVID-19 negative in this study, experiencing any of the symptoms similar to COVID-19 was one of the important predictors of well-being in pregnancy. Even if the COVID-19 test is negative, the presence of symptoms similar to COVID-19 increases the risk of anxiety and fear of infection (Kahyaoglu & Kucukkaya, 2020). In fact, social isolation has been recommended for those who test negative for COVID-19 and have symptoms of COVID-19. Social isolation, the fear of infecting the baby of the pregnant woman, and the uncertainty during the pandemic process can negatively affect the well-being of pregnant women.

In the regression analysis, the week of gestation was also a predictor of well-being in pregnancy. As the pregnancy progresses, positive developments, such as decreasing pregnancy distress, feeling the movements of the baby and learning the gender of the baby, increase the cognitive and physical well-being in pregnancy along with maternal–fetal attachment (Delavari, Mohammad-Alizadeh-Charandabi, & Mirghafurvand, 2018). Studies conducted before the pandemic have indicated that attachment increases as the week of gestation increases, consistent with our study (Salehi, Salehi, & Shaali, 2017; Atashi, Kohan, Salehi, & Salehi, 2018).

In the last step of regression analysis, maternal–fetal attachment and well-being in pregnancy were found to be important predictors of each other. Zahrani, Rafiei, Hajian, Majd, and Izadi (2020) examined the relationship between mental health and maternal–fetal attachment behaviours in pregnant women and found that high mental health is associated with increased maternal–fetal attachment behaviours. However, the COVID-19 pandemic, which requires social isolation, had negative effects on pregnant women. It has become a process that decreases social support, increases problems in reaching healthcare professionals, affects the well-being of pregnant women and threatens maternal–fetal attachment (Lee et al., 2005; Ng, Sham, Leng Tang, & Fung, 2004; Taubman-Ben-Ari, Chasson, Abu Sharkia, & Weiss, 2020).

Limitations of the Study

As far as we know, our study is the first to evaluate the well-being and attachment levels of pregnant women during the COVID-19 pandemic process and their influencing factors. Nevertheless, the study has some limitations. First, the cross-sectional form of this study prevents any outcome from being determined in terms of causality. A prospective cohort study would be more reliable in determining causes. Second, the research was conducted in one city only, and thus the results might not be generalizable. Further studies should cover a wider area.

CONCLUSION

Information about pregnancy, childbirth and the postpartum period during the COVID-19 outbreak is limited. While focusing on the physiological health of the mother, her communication with the fetus, psychosocial status and well-being during pregnancy should not be ignored. In addition, the implications of the COVID-19 process for pregnancy well-being and for the mother and fetus are still uncertain. In terms of

the maternal–fetal attachment during the COVID-19 pandemic process, the education level of pregnant women, the working status of their spouse, their smoking status and their pregnancy were affected by demographic and obstetric results, such as planned pregnancy and expected gender of the baby. In terms of the level of well-being in pregnancy, the working status of the pregnant woman’s spouse was influenced by the planned pregnancy, expected gender of the baby and the presence of COVID-19-like symptoms. Pregnant women need to improve their communication with their babies who will be born in an uncertain and life-threatening period, such as the COVID-19 pandemic, and to be in a state of mental and physical well-being. Midwives must adopt an appropriate midwifery approach and ensure that the process is managed correctly. Considering her obstetric and sociodemographic characteristics, each pregnant woman should be able to make special interventions to increase maternal–fetal attachment and pregnancy well-being. Evaluating the communication of pregnant women with the fetus during the COVID-19 pandemic and paying attention to their psychological status can help improve and increase pregnancy well-being. Midwives should provide supportive care as healthcare professionals who play a key role in identifying and meeting the needs of pregnant women during the COVID-19 pandemic.

In conclusion, midwives and healthcare professionals should know pregnant women’s attachment and well-being and how they will be affected during a difficult pregnancy. Therefore, it is important to take specific interventions for pregnant women.

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