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COVID-19 fear, vaccination hesitancy, and vaccination status in pregnant and breastfeeding women in Turkey

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Abstract

This study aimed to determine the level of COVID-19 fear, vaccination, and vaccination hesitancy as well as the affecting factors in pregnant and breastfeeding women who participated in an online prenatal education in Turkey. The study, which was designed as descriptive cross-sectional, was conducted online with 360 pregnant and breastfeeding women from Istanbul. Data were collected through the Participant Information Form, Fear of COVID-19 Scale and Vaccine Hesitancy Scale in Pandemics. The rate of accepting the COVID-19 vaccine is 65.6%. The Fear of COVID-19 Scale was 16.21±5.54, and the Vaccine Hesitancy Scale in Pandemics mean score was 29.29±4.54. The COVID-19 fear of the women participating in this study was moderate, the level of vaccination hesitancy was low, and two-thirds of them were vaccinated. There is a need to organize special counseling and vaccination campaigns for pregnant and lactating women. *(Afr J Reprod Health 2023; 27 [6]: 60-69).*

Keywords: COVID-19; fear, pandemic, pregnancy, vaccine, vaccine hesitancy

Résumé

Cette étude visait à déterminer le niveau de peur du COVID-19, la vaccination et l'hésitation à la vaccination ainsi que les facteurs affectant les femmes enceintes et allaitantes qui ont participé à une éducation prénatale en ligne en Turquie. L'étude, qui a été conçue comme transversale descriptive, a été menée en ligne auprès de 360 femmes enceintes et allaitantes d'Istanbul. Les données ont été recueillies au moyen du formulaire d'information du participant, de l'échelle de peur de la COVID-19 et de l'échelle d'hésitation à la vaccination en cas de pandémie. Le taux d'acceptation du vaccin COVID-19 est de 65,6 %. L'échelle de peur du COVID-19 était de 16,21±5,54 et le score moyen de l'échelle d'hésitation à la vaccination en cas de pandémie était de 29,29±4,54. La peur du COVID-19 des femmes participant à cette étude était modérée, le niveau d'hésitation à la vaccination était faible et les deux tiers d'entre elles étaient vaccinées. Il est nécessaire d'organiser des campagnes spéciales de conseil et de vaccination pour les femmes enceintes et allaitantes. *(Afr J Reprod Health 2023; 27 [6]: 60-69).*

Mots-clés: COVID-19, peur, pandémie, grossesse, vaccin, hésitation à la vaccination

Introduction

The COVID-19 Pandemic has affected every part of society by causing mortality and morbidity and causing social fear. Pregnant and breastfeeding women, who are vulnerable groups, are also affected by this situation[1]. Severe acute respiratory syndrome, thrombosis, maternal death, preterm birth, fetal death, maternal admission to intensive care, mechanical ventilation risk, and cesarean section risk are high in COVID-19 infection during pregnancy[2-5]. COVID-19 prognosis worsens when pregnancy is accompanied by diseases such as diabetes, hypertension, preeclampsia, and obesity[6,7]. COVID-19 increases the risk of maternal death 22 times and the risk of premature birth 3 times[8]. The coverage of maternal and fetal effects of COVID-19 infection of pregnant women on social media may increase the anxiety and fear of pregnant women[1]. In the available sources, it has been stated that the vast majority of pregnant women are afraid of infecting themselves and their

babies with COVID-19[9-11]. Current literature emphasizes that women should be vaccinated to protect themselves and their babies[8,12].

The rapid development process of the COVID-19 vaccine has brought along vaccine hesitancy. COVID-19 vaccines are vaccines clinically approved for safety. However, pregnant, and breastfeeding women were not included in clinical studies because they are vulnerable groups[5]. This situation has caused doubts about the safety and efficacy of the vaccine. Pregnant and breastfeeding women are torn between fears that the vaccine may have adverse effects on fertility, fetus and breast milk, and fear of COVID-19[9].

Today, studies on the COVID-19 vaccine and its effects on pregnant and breastfeeding women have shown that the vaccine is safe and effective[8]. American College of Obstetricians and Gynecologists (ACOG), Royal College of Obstetricians and Gynecologists (RCOG), Centers for Disease Control and Prevention (CDC), Society for Maternal-Fetal Medicine (SMFM), Turkish Medical Association, Turkish Society of Gynecology and Obstetrics and Republic of Turkey Ministry of Health recommends the COVID-19 vaccine to pregnant and breastfeeding women[5]. However, the latest developments on the COVID-19 vaccine have not yet reached enough health personnel and pregnant/breastfeeding women. The hesitancy of health personnel, who are the most reliable sources of information for pregnant women about the COVID-19 vaccine during pregnancy and breastfeeding, and the information pollution on social media can affect the COVID-19 vaccination rates of women[2,3].

While there is COVID-19 fear on one side and vaccination hesitancy on the other, current information on the rate of pregnant and breastfeeding women who have COVID-19 vaccines, and the affecting factors can be a guide for future infectious diseases and vaccination. Most of the existing studies on pregnant and breastfeeding women were done during the period when the safety of the vaccine was not approved and focused on the decision to be vaccinated in case it was declared to be safe. However, the decision to get vaccinated can change over time[13,14]. In the period when it was announced that vaccines were safe in Turkey, there were no studies on the fear of COVID-19, vaccination rate, and vaccine hesitancy in pregnant and breastfeeding women. This study aimed to determine the level of COVID-19 fear, vaccine hesitancy, vaccination rate, and affecting factors in pregnant and breastfeeding women who participated in an online prenatal education at a time when vaccines are declared to be safe.

Methods

Study design and population

This cross-sectional descriptive study was carried out between February 07, 2022 and April 22, 2022. The study was conducted online by two of the researchers on a social media platform whose members were women enrolled in the prenatal education class. Women who were members of the platform participated in online prenatal education between October 2020 and April 2022. The population of the study consisted of 700 pregnant and breastfeeding women registered to the above-mentioned social media account. The sample size was determined over the specified number of members using the sample calculation of the known universe. Accordingly, it was calculated that a minimum of 248 pregnant and breastfeeding women should be reached with a 95% confidence interval and 5% sampling error. To reach the determined sample number, all members were invited to the study by sending a message, and feedback was received from 361 members. One woman was excluded because she had a stillbirth, and as a result, the study was completed with 360 participants. Sampling criteria consisted of being a member of the above-mentioned social media account, being a pregnant or breastfeeding woman over the age of 18, and agreeing to participate in the study. Losing a baby or not breastfeeding after birth were among the exclusion criteria.

Data collection and data collection tools

This study was conducted online under the conditions of the COVID-19 pandemic.

The "Personal Data Form", "Fear of Coronavirus (COVID-19) Scale" and "Vaccine Hesitancy Scale in Pandemics" prepared in the Google Forms* environment were shared on the social media platform. Prepared online surveys were set to be filled only once and each question was mandatory to be answered. Thus, participants were prevented from filling out more than one form. In addition, possible data loss was prevented by making it obligatory to answer all questions. Filling out the questionnaires took about 10 minutes.

The personal data form was created by the researchers in line with the literature[6,15,16]. Six of the 14 questions included sociodemographic data such as age, educational status, etc., and 8 of them included data on coronavirus disease and vaccination status.

Fear of Coronavirus (COVID-19) Scale (FCV-19S); The scale was developed by Ahorsu *et al*. to determine the fear of COVID-19 in individuals[17]. The Turkish language validity of the scale was conducted by Bakioglu *et al*.[18]. There is no reverse item in this scale, which consists of 7 one-dimensional items. To determine the level of agreement of individuals for each item, a five-point Likert-type rating is used as "Strongly disagree (1)", "Disagree (2)", "Undecided (3)", "Agree (4)", "Strongly agree (5)". The total score obtained from all items of the scale reflects the level of fear of Coronavirus (COVID-19) experienced by the individual. The scores that can be obtained from the scale range from 7 to 35. A high score on the scale with no cut-off value means experiencing a high level of coronavirus fear[18]. The Cronbach's alpha value of the original scale was 0.82; and it was 0.88 for the Turkish version[17,18]. In this study, Cronbach's alpha value of the scale was calculated as 0.87.

Vaccine Hesitancy Scale in Pandemics; This scale is a modified version of the "Vaccine Hesitancy Scale" developed by Larson *et al.* to determine vaccine hesitancy during pandemics[19]. This modified version is in Turkish, and its validity and reliability were evaluated by Capar and Cinar[20]. The scale consists of 10 items and two subscales in total. The first subscale "Lack of Confidence" consists of eight items. The second subscale "Risk" consists of two items. To determine the level of agreement of individuals for each item, a five-point Likert-type rating was used as "Strongly disagree (1)", "Disagree (2)", "Neither agree, nor disagree (3)", "Agree (4)", "Strongly agree (5)". The total score of the scale varies between 10 and 100 and reflects the vaccine hesitancy level experienced by the individual during the pandemic. A high score from the scale with no cut-off value indicates high hesitancy about the vaccine. A high score from the "Lack of Confidence" subscale indicates an increased distrust towards the vaccine. A high score from the "Risk" subscale indicates an increased belief that the vaccine is risky. The Cronbach's alpha coefficient of the Vaccine Hesitancy Scale in Pandemics is 0.90[20]. In this study, the Cronbach's alpha coefficient was calculated as 0.84.

Statistical analyses

The distribution of the data was evaluated with the Kolmogorov-Smirnov test. Percentage, number, mean, and minimum-maximum values were used for descriptive findings. Chi-square, Mann-Whitney U, Kruskal-Wallis test, and Pearson correlation test were used in the analysis of the data. In the 3-category variables in which the Kruskal-Wallis test was applied, the group that caused the difference was evaluated with the Post Hoc test. A $p<0.05$ level was considered statistically significant.

Ethical considerations

Before the research, ethics committee approval (2022/27) was obtained from the Istanbul Kultur University Ethics Committee on February 03, 2022. Permission to use the scales in the study was obtained from the authors via e-mail. Online consent was obtained from the participants with the "Informed Voluntary Consent Form" prepared in accordance with the Declaration of Helsinki. The personal data of the participants were not collected.

Results

Of the 360 participants in this study, 44.4% (n=160) were pregnant women and 55.6% (n=200) were breastfeeding women. The gestational week of 79.4% of the pregnant women varied between 27-41 weeks. The babies of 42.5% of the breastfeeding women were between 7-12 months.

Table 1: Distribution of the descriptive characteristics of women according to their COVID-19 vaccination status

Descriptive information	Total n (%) 360 (100,0)	Vaccinated n (%) 236 (65,6)	Unvaccinated n (%) 124 (34,4)	x^2 / p
Age				
20-24	33 (9,2)	14(42,4)	19 (57,6)	10,659
25-29	143 (39,7)	91 (63,6)	52 (36,4)	**p:0,014***
30-34	140 (38,9)	100 (71,4)	40 (28,6)	
35-40	44 (12,2)	31 (70,5)	13 (29,5)	
Educational Status				
Secondary education	44 (12.2)	19 (43,2)	25 (56,8)	16,737
Undergraduate	252 (70)	165 (65,5)	87 (34,5)	**p:0,000***
Graduate	64 (17,8)	52 (81,3)	12 (18,8)	
Employment				
Employed	226 (62,8)	171 (75,7)	55 (24,3)	27,474
Unemployed	134 (37,2)	65 (48,5)	69 (51,5)	**p:0,000***
Income Level				
Income less than expenses	68 (18,9)	41 (60,3)	27 (39,7)	1,499
Income equal to expenses	203 (56,4)	133 (65,5)	70 (34,5)	p:0,473
Income more than expenses	89 (24,7)	62 (69,7)	27 (30,3)	
COVID-19 history				
No	199 (55,3)	141 (70,9)	58 (29,1)	5,533
Yes	161 (44,7)	95 (59,0)	66 (41,0)	**p:0,019***
Losing a relative due to COVID-19				
No	277 (76,9)	182 (65,7)	95 (34,3)	0,012
Yes	83 (23,1)	54 (65,1)	29 (34,9)	p:0,914
Vaccination status of family members				
Not vaccinated	43 (11,9)	12 (27,9)	31 (72,1)	30,654
Vaccinated	317 (88,1)	224 (70,7)	93 (29,3)	**p:0,000***
Desire to have childhood vaccinations for their unborn baby				
I'm undecided	33 (9,2)	15(45,5)	18 (54,5)	52,633
Yes, I will	303 (84,2)	220 (72,6)	83 (27,4)	**p:0,000***
No, I don't	24 (6,6)	1 (4,2)	23 (95,8)	

*x^2: Pearson chi-square test * p<0,05*

Table 2: Comparison of FCV-19S and COVID-19 Vaccine Hesitancy Scale mean scores in pregnant and breastfeeding women

	Breastfeeding women	**Pregnant women**	**p**
FCV-19S	16,59±5,61 (7-33)	15,73±5,42 (7-31)	0,29*
COVID-19 Vaccine hesitancy scale	29,28±4,56 (18-43)	29,30±4,53 (20-44)	0,61*
Lack of confidence subscale	23,14±3,94 (14-37)	23,12±3,80 (14-36)	0,63*
Risk subscale	6,14±1,44 (2-10)	6,18±1,33 (3-10)	0,92*

*Mann-Whitney U

The other descriptive characteristics of the women and the comparison of these characteristics with the COVID-19 vaccination status are given in Table 1. In the comparison, no statistically significant difference was found between the status of being vaccinated, the income level, and the loss of a relative due to COVID-19 (p>0.05). On the other hand, there was a statistically significant difference between vaccination status and age (p=0.014), education status (p=0.000), employment status (p=0.000), history of having COVID-19 (p=0.019), vaccination status of family members (p=0.000) and planning childhood vaccinations for their baby (p=0.000). The results showed that those with higher levels of education, those who were employed, those who did not have COVID-19 history, and women with vaccinated family members were more likely to accept the COVID-19

Table 3: The impact of women's descriptive characteristics on COVID-19 fear and vaccine hesitancy

	COVID-19 Fear	**COVID-19 Vaccine hesitancy**		**COVID-19 Vaccine Hesitancy**
		Lack of confidence subscale	Risk subscale	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age				
20-24	14,88±5,41	25,30±4,54	5,82±1,36	31,12±4,50
25-29	15,82±5,41	23,61±3,98	6,34±1,55	29,96±4,58
30-34	16,83±5,58	23,23±4,08	6,27±1,45	29,51±4,95
35-40	16,21±5,85	22,98±4,24	5,93±1,45	28,91±5,27
p	p:0,16	p:0,05	p:0,08	p:0,09
Education				
Secondary education	15,93±5,53	24,89±4,13	5,94±1,45	31,02±4,53
Undergraduate	16,09±5,52	23,15±3,78	6,25±1,40	29,86±4,76
Graduate	16,85±5,48	21,87±3,65	5,93±1,32	28,51±5,01
p	p:0,55*	**p:0,02*[a]**	p:0,20*	p:0,16*
Employment				
Employed	16,42±5,34	22,52±3,71	6,06±1,36	29,18±4,85
Unemployed	15,86±5,87	24,14±3,95	6,32±1,45	30,75±4,60
p	p:0,27**	**p:0,00****	p:0,13**	**p:0,00****
Income Level				
Income less than expenses	18,11±6,12	23,60±3,67	6,18±1,35	29,69±4,42
Income equal to expenses	15,87±5,38	23,15±3,81	6,12±1,45	29,84±4,70
Income more than expenses	15,52±5,16	22,70±4,16	6,23±1,32	29,65±5,38
p	**p:0,01*[a]**	P:0,21	P:0,50	p:0,88
COVID-19 history				
No	16,94±5,59	22,74±4,02	6,09±1,40	29,27±4,80
Before pregnancy	15,03±5,03	23,24±3,41	6,34±1,47	30,26±4,93
During pregnancy	15,02±5,83	22,04±3,81	6,11±1,46	30,78±4,87
After pregnancy	16,31±4,89	23,37±3,67	6,34±1,16	29,71±4,36
p	**p:0,02*[a]**	p:0,73*	p:0,68*	p:0,16*
Status of family members having COVID-19				
No	17,63±6,03	22,30±3,33	5,91±1,30	28,80±4,46
Nuclear family	15,98±5,50	23,70±4,20	6,32±1,37	30,41±5,13
Close relative	15,37±4,99	23,05±3,73	6,15±1,49	29,70±4,57
p	**p:0,03*[a]**	p:0,06*	p:0,19*	p:0,09*
Losing a relative due to COVID-19				
No	16,12±5,58	23,34±4,24	6,16±1,53	29,51±5,01
Yes	16,51±5,43	24,21±3,64	6,39±1,33	30,61±4,01
p	p:0,71**	**p:0,04****	**p:**0,05**	**p:0,02****
Vaccination status of family members				
Not vaccinated	12,86±5,51	26,00±4,68	6,61±1,68	33,79±5,02
Vaccinated	16,66±5,39	22,82±3,66	6,11±1,36	29,22±4,52
p	**p:0,00****	**p:0,00****	p:0,06**	**p:0,00****
Vaccination				
No	14,40±5,72	25,53±3,84	6,70±1,51	33,01±4,61
Before pregnancy	16,32±4,74	21,34±3,33	5,71±1,16	27,12±3,63
During pregnancy	17,22±5,25	21,59±2,98	5,78±1,13	27,42±3,55
After pregnancy	17,43±5,35	22,82±3,65	6,13±1,41	28,95±4,27
p	**P:0,000*[a]**	**p:0,000*[a]**	**p:0,000*[a]**	**p:0,000*[a]**
Desire to have childhood vaccinations for their unborn baby				
I'm undecided	15,72±6,82	26,57±6,22	6,78±1,67	33,00±6,03
Yes, I will	16,68±5,24	22,80±3,52	6,11±1,32	28,93±4,19
No, I won't	10,91±4,54	28,88±3,88	6,88±2,66	35,83±4,28
p	**p:0,00*[a]**	**p:0,00*[a]**	p:0,07*	**p:0,00*[a]**

***** *Kruskal-Wallis* ** *Mann-Whitney U* [a] *Post Hoc*

Table 4: Pearson correlation analysis between FCV-19S scores and COVID-19 vaccine hesitancy scale scores

		Lack of confidence	**Risk**	**The COVID-19 Vaccine Hesitancy Scale Total score**
FCV-19S	r	-0,309*	-0,067*	-0,285*
	p	0,00	0,21	0,00
	n	360	360	360

***** *Pearson correlation test*

vaccine. On the other hand, those who did not plan for their baby to have childhood vaccinations were more likely to reject the COVID-19 vaccine.

When the scores of the participants from the scales used in the study were examined, it was determined that the FCV-19S total mean score was 16.21±5.54 (min:7, max:35), and the total mean score of the COVID-19 Vaccine Hesitancy Scale was 29.29± 4.54 (min:18, max:44). No statistically significant difference was found between pregnant and breastfeeding women when FCV-19S and COVID-19 Vaccine Hesitancy were compared (p>0.05) (Table 2). Therefore, the data of pregnant and lactating women were evaluated together.

Comparison of the descriptive characteristics of the participants and the FCV-19S and COVID-19 Vaccine Hesitancy Scale mean scores are given in Table 3. In the comparison, no statistically significant difference was found between age, education level, employment status, loss of a relative due to COVID-19, and FCV-19S mean score (p>0.05). However, the FCV-19S mean score of those whose income is less than their expenses (p=0.01), those whose family members were vaccinated (p=0.00), and those who themselves (p=0.02) and their relatives did not have COVID-19 history (p=0.03) was higher. On the other hand, the FCV-19S mean scores of those who were not vaccinated and those who did not plan to have their baby vaccinated were lower than the other groups (p=0.00) (Table 3).

When comparing the mean score of the COVID-19 Vaccine Hesitancy Scale and the descriptive characteristics, the scale scores of those whose family members were vaccinated (p=0.00) and those who were planning vaccination for their baby (p=0.00) were found to be lower. On the other hand, the COVID-19 vaccine hesitancy score of those who were not vaccinated was higher than those who were vaccinated before, during, and after pregnancy (p:0,00). In addition, those who were vaccinated after pregnancy had a higher COVID-19 vaccine hesitancy score than those who were vaccinated during pregnancy (p<0,05) (Table 3). When unvaccinated women were asked about the reason for their hesitancy, 50% stated that they did not trust the vaccine, and 50% stated that they should not be vaccinated during pregnancy/breastfeeding.

In this study, the relationship between FCV-19S and COVID-19 vaccine hesitancy in pregnant and breastfeeding women is examined in Table 4. It was observed that there was a weak negative correlation between the FCV-19S score of the women and the COVID-19 Vaccine Hesitancy score [r (360)=-0.28; p=0.00].

Discussion

At the time of this study, the COVID-19 vaccine was confirmed by international organizations to be safe[16]. The originality of this study is to evaluate the fear of COVID-19, the rate of vaccination, and the hesitancy of the COVID-19 vaccine at a time when the COVID-19 vaccine was approved to be safe for pregnant and breastfeeding women.

Fear of COVID-19 in pregnant and breastfeeding women

The consequences of the COVID-19 pandemic on worldwide morbidity and mortality have caused fear all over the world[21]. Although this study was conducted in the second year of the COVID-19 pandemic, the mean COVID-19 fear score of the participating pregnant and breastfeeding women was moderate and was higher than the results of a meta-analysis study in which 91 studies were examined[22]. During the data collection process, the prevalence of the COVID-19 Delta variant in Turkey and the frequent coverage of the issue in the

media were thought to be the reason for this situation.

One of the interesting findings of this study is that women who or whose relatives did not have COVID-19 history have a higher fear score. The high rate of vaccination among women who did not have COVID-19 history shows that this result is not a coincidence. The best-known cause of fear of COVID-19 is the fear of the unknown[23]. It is quite natural at this point that those who did not have the disease continue to fear the unknown and prefer to be vaccinated for protection. Another important finding of the study is that those with low fear of COVID-19 have a higher rate of refusal to have their infants receive childhood vaccinations. In current studies, fear of COVID-19 and vaccine acceptance have shown a significant positive correlation[24,25]. In this regard, it is thought that anti-vaccination and disinformation, especially in social media channels, affect vaccination programs negatively by causing complacency in individuals.

COVID-19 vaccine hesitancy in pregnant and breastfeeding women

With the pandemic, vaccine hesitancy has become even more visible[26]. In a study of the general population in Arkansas, it was reported that one in five people was hesitant to get the COVID-19 vaccine[27]. In another study conducted in the United States (USA), the COVID-19 vaccine acceptance rate of pregnant women was 58.4%[28]. In this study, the mean score of the COVID-19 vaccine hesitancy scale of the women was 29.29±4.54, and it was determined that 65.6% of the women accepted the COVID-19 vaccine. These findings show that the vaccine hesitancy level of the participants is low compared to the studies in literature.

It can be thought that losing a relative due to COVID-19 will reduce vaccine hesitancy and positively affect the attitude toward vaccines. On the other hand, in this study, vaccine hesitancy was found to be higher in those who lost a relative due to COVID-19 infection than in those who did not. No similar finding was found in the literature search. This may be either coincidence, or it may be based on a reason. Therefore, it is thought that it will be useful to address the problem with in-depth focus group interviews.

In this study, it has been determined that both the lack of confidence and hesitancy about vaccines are high in those who and whose family members have not been vaccinated and those who do not plan to have their baby vaccinated in childhood. These findings, which are supportive of each other, show that a group of women in this study experienced severe vaccine hesitancy. The World Health Organization has reported that one of the three main factors affecting vaccine hesitancy is the "lack of confidence", as we have found in this study[29]. The most reliable source of information about vaccines for women is healthcare workers[30]. Healthcare workers have great responsibilities in this regard. However, in the study conducted by Yilmaz et al. in Turkey, the vaccination of pregnant and breastfeeding women has been an issue that health worker has been the most hesitant about[3]. For this reason, it is important to ensure that healthcare workers are educated and informed about current developments.

In the general population, it has been shown that the level of COVID-19 fear affects individuals' risk perception and shapes their motivation for vaccination. For example, Willis et al. (2021) reported that the absence of COVID-19 fear increased the rate of vaccine hesitancy by 5.48 times[27]. In this study, a weak negative correlation was observed between the COVID-19 fear and the vaccine hesitancy score. This finding is similar to the literature and supports other findings obtained from the study. In summary, the increase in fear of COVID-19 leads to a decrease in vaccine hesitancy.

Vaccination status in pregnant and breastfeeding women

Vaccination is multifactorial and can be affected by factors such as confidence in the vaccine, belief in the necessity of the vaccine, and availability of the vaccine[29]. In addition, the increasing evidence that COVID-19 vaccines are reliable, and the impartial and evidence-based counseling by healthcare professionals positively affect the COVID-19 vaccine acceptance rate of pregnant and breastfeeding women[2,15]. For example, in a study conducted in January 2021 in Turkey, 37% of pregnant women stated that they can be vaccinated if it is recommended[15]. In this study, 65.6% of

pregnant and breastfeeding women received the COVID-19 vaccine. Although it was conducted in Turkey, the difference between the study by Ayhan *et al.* and this study was attributed to the fact that all our participants received prenatal education and the confidence in vaccines in the country increased during the time passed[15].

Education level is an important factor in maintaining and improving general health[31,32]. It is predicted that it will increase the vaccination rates to make it easier to reach the developments in the field of health and the right information sources. In this context, the results of the study showed that high education level increases the rates of vaccination, as shown in this study[14,30,33]. Within the framework of the philosophy of lifelong learning, it is thought that the education programs that will be structured to appeal to women with low education levels can increase the rate of vaccination in this group.

Employed women are more in contact with the external environment than those who are housewives, and naturally, they can be expected to perceive a higher risk of COVID-19 infection. The increase in risk perception, on the other hand, may be a factor that increases vaccine acceptance, just like the age factor. In the comparison made from this point of view, both the COVID-19 fear level and vaccination rates of employed women were found to be higher. The study of Sznajder *et al.* also supports this finding[34].

Family members of most women participating in this study were vaccinated. The vaccination rate of families of unvaccinated women is also significantly lower. In support of this finding, a study conducted in Thailand found that the husband's acceptance of the vaccine resulted in a 4.8-fold increase in the rate of acceptance of the vaccine by the pregnant woman[13]. It is not a coincidence that the family members of unvaccinated women are also unvaccinated and it can be considered a kind of mass rejection of vaccination. Again, the fact that almost all the women who stated in this study that they would refuse the childhood vaccinations for their unborn babies did not have the COVID-19 vaccine, supports our opinion. From this point of view, it will be important to evaluate the family as a whole and carry out educational activities to increase the vaccination rates for COVID-19 and similar epidemic diseases that may occur in the future.

Limitations and Strengths

This study has some limitations and strengths. Since the research was conducted with a nonprobability sampling method, the first limitation is that the findings are limited to the study group and cannot be generalized. Another limitation is that the study reflects women who have received prenatal education. In addition, since this study was conducted under the conditions of the COVID-19 pandemic, reaching pregnant and lactating women has been a problem. Therefore, this study was done online. The online group of women does not represent pregnant and breastfeeding women in the general population.

Existing studies on the subject have evaluated the intention of pregnant and postpartum women to be vaccinated. In this study, the vaccination status of women and the effective factors were revealed. The originality of this study is that it evaluated the fear of COVID-19 and the hesitancy of the COVID-19 vaccine at a time when the COVID-19 vaccine was known to be safe for pregnant and breastfeeding women. Another strength of the study is that, unlike other studies, data were collected with standard measurement tools.

Conclusion

In this study, conducted in the second year of the pandemic, the COVID-19 fear of pregnant and breastfeeding women is moderate. The factors that increase the fear of COVID-19 are the low-income level, the fact that the woman and her relatives did not have COVID-19 history and the high rate of vaccination in the family. On the other hand, those who are not vaccinated and those who do not plan to have their baby vaccinated have a low fear of COVID-19. The COVID-19 vaccine hesitancy level of women is low, and two-thirds of them have been vaccinated. Factors that increase vaccination include high education level, employment, not having COVID-19 history, and having their family vaccinated. The factor reducing the vaccination rate was determined to be the rejection of childhood

vaccinations for the baby. Vaccination hesitancy is low in those whose family members are vaccinated and who are planning to vaccinate their baby, whereas it is high in those who are not employed, those who have lost a relative due to COVID-19, and those whose family members are not vaccinated.

Based on the results of the study, it is recommended to organize special counseling and vaccination campaigns for pregnant and lactating women in possible new pandemics. In addition, it is recommended that women who are hesitant about childhood vaccines can be seen as individuals who will be hesitant about vaccination in possible new pandemics and that widespread education should be organized for these groups.

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Conflict of ınterest

The authors declare that there is no conflict of interest.

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