Annals of Clinical and Analytical Medicine
Original Research

The effect of COVID-19 infection in pregnancy on childbirth fear and prenatal attachment level in pregnant women: A survey study

Eda Bingül[1], Bakiye Akbaş[2], Berna Aşır[1], Selvihan Tapanoğlu Karaca[1], Sibel Ejder Tekgündüz[1], Ayşe Nur Aksoy[1]
[1] Department of Obstetrics and Gynecology, Health Sciences University, Erzurum Regional Education and Research Hospital, Erzurum
[2] Department of Obstetrics and Gynecology, Faculty of Medicine, Istinye University, Istanbul, Turkey

Abstract
Aim: Fear of childbirth is an emotional stress that affects the mental health and well-being of mothers during pregnancy. The aim of the present study was to compare the prenatal attachment, childbirth fear and hopelessness levels of pregnant women who had and did not have COVID-19 infection during pregnancy.
Material and Methods: This prospective questionnaire study was conducted with participants between the ages of 18 and 40 who had 20 or more gestational weeks. Two groups were formed as follows: Group 1: Participants who had COVID-19 infection, and Group 2: Participants who did not have COVID-19 infection during pregnancy. Patients in both groups were given questionnaires using Wijma Delivery Expectancy/Experience Questionnaire, Prenatal Attachment Inventory and Beck Hopelessness Scale, and the results were recorded.
Results: Childbirth fear and Beck Hopelessness Scale scores were higher in Group 1 than in Group 2 ($p < 0.001$ and $p = 0.023$, respectively). The Prenatal Attachment Inventory scale score of Group 2 was higher than that of Group 1 ($p = 0.001$). A negative correlation was observed between childbirth fear and prenatal attachment scores ($p = 0.012$, $r= -0.250$). There was a negative correlation between the Beck Hopelessness Scale score and Prenatal Attachment Inventory scores ($p < 0.001$, $r= -0.416$).
Discussion: Covid-19 infection during pregnancy increased the childbirth fear and hopelessness levels in pregnant women while reducing the prenatal attachment level. Pregnant women should be informed about prevention methods against COVID-19 infection and necessary measures should be taken.

Keywords
COVID-19, Fear of Childbirth, Hopelessness, Pregnancy, Prenatal Attachment

DOI: 10.4328/ACAM.21255 Received: 2022-06-11 Accepted: 2022-07-15 Published Online: 2022-07-18
Corresponding Author: Bakiye Akbaş, Department of Obstetrics and Gynecology, Faculty of Medicine, Istinye University, Istanbul, Turkey.
E-mail: bakiyeokumus@gmail.com P: +90 532 240 81 07
Corresponding Author ORCID ID: https://orcid.org/0000-0003-2480-1374

Introduction

While dreaming of having a baby, pregnant women may have the fear of childbirth pain, obstetric intervention anxiety and concerns about the baby's health. Severe childbirth fear can increase the mother's blood pressure, leading to premature birth and an increase in cesarean section rates due to fetal distress. In addition, it can reduce oxytocin levels, causing prolongation or even arrest of labor [1, 2]. It was reported that due to childbirth fear, women could postpone pregnancy, avoid conception, and pregnant women could decide to terminate the pregnancy or undergo an optional cesarean section [3, 4].

A safe bonding of mother and baby is crucial in the social and emotional development of the baby. During pregnancy, the mother's love for her baby and the establishment of a bond was defined by Muller [5] as a prenatal attachment. It is known that the basis of mother-baby attachment is laid in the prenatal period. Prenatal attachment begins with the woman' positive reaction to pregnancy. An attached pregnant believes that she has a connection with her baby, imagines her baby, and considers her as a separate individual. These thoughts cause the mother to show love, compassion and care, to protect, and to interact sensitively with the baby. Prenatal attachment may be affected by the psychological and social state of the mother during the prenatal period. Studies showed that anxiety and depression of the mother affect the level of prenatal attachment [6].

COVID-19 infection spread rapidly around the world and was declared a pandemic by the World Health Organization (WHO). COVID-19 infection is considered a risk factor for pregnant women. As a result of social measures taken due to the COVID-19 pandemic and protocols implemented by health institutions, pregnant women who faced childbirth, which is an irreversible moment of life, did not receive adequate support from their spouses and families, which led to an increase in anxiety and fear levels [7]. Studies reported optional abortions due to concerns about the fate of COVID-19 infection in early gestational weeks [8]. The effect of COVID-19 infection on pregnancy-related fear and anxiety has not been systematically revealed, and information about the clinical characteristics of pregnant women who have the infection is limited.

The aim of the present study was to compare the prenatal attachment, childbirth fear and hopelessness levels of pregnant women who had and did not have COVID-19 infection during pregnancy.

Material and Methods

This prospective survey was conducted on pregnant women with 20 or more gestational weeks and followed up at SBU Erzurum Regional Education and Research Hospital Obstetrics and Gynecology Clinic. The participants were informed before the study and their written approval was obtained. The exclusion criteria for the volunteers in the study were ages younger than 18 and over 40, the presence of fetal anomaly and additional diseases such as hypertension or diabetes, chronic or psychiatric disease, mental illness, unwillingness to participate and previous birth-related negative experiences.

Two groups of patients were formed with the participants in the study: Group 1: Participants who had COVID-19 infection during pregnancy, and Group 2: Participants who did not have COVID-19 infection during pregnancy. Demographic data of the patients along with clinical data such as pregnancy week during the COVID-19 infection, whether hospitalization was required due to COVID-19 infection, need for intensive care and drug use due to COVID-19 infection were recorded. All participants were given Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) to measure birth fear, Prenatal Attachment Inventory (PAI) to measure prenatal attachment level, and Beck Hopelessness Scale (BHS) to measure levels of hopelessness and were asked to read and answer the questions. Scores of the measurement tools were recorded.

Wijma Birth Expectation/ Experience Scale - Version A (W-DEQ/ A Version)

The scale consisting of 33 items to measure the fear of childbirth experienced by women was developed by Wijma et al. [9]. Responses on the scale are numbered from 0 to 5 where 0 is expressed as "extremely" and 5 as "not at all". The minimum score on the scale is 0, while the maximum is 165. Higher scores mean higher childbirth fear experienced by women. The scale was adopted to Turkish, and validity and reliability studies were performed by Körükçü et al. [10]. The Cronbach alpha value of the scale was 0.89 and the split-half reliability was 0.91.

Prenatal Attachment Inventory (PAI)

This inventory was developed by Muller [5] in 1993 to measure the level of prenatal attachment in pregnant women and is one of the most commonly used tools in the literature to measure the level of prenatal attachment. The scale, developed to determine the levels of emotion, thought and attachment of women to their babies during pregnancy, consists of 21 items. Each item is a 4-point Likert type: 1: never, 2: sometimes, 3: often, 4: always. The minimum score is 21 and the maximum score is 84 points. Higher scores indicate higher levels of prenatal attachment. Turkish validity and reliability study of the inventory was performed by Yilmaz et al. [11] and Cronbach alpha was 0.84.

Beck Hopelessness Scale (BHS)

This scale was developed by Beck et al. [12] in 1971 to determine an individual's negative expectations for the future. Turkish validity and reliability study was carried out by Dilbaz et al. [13]. The scale consists of 20 items, scored by 0 or 1 where a compatible response is given a "1" score and an incompatible response is given a "0" score. The resulting arithmetic sum constitutes the total "score of hopelessness". The scale has no threshold point, and the score ranges between 0 and 20. Higher scores mean higher hopelessness levels of the individual. In this study, the Cronbach Alpha value of the scale was found to be 0.84.

Statistical Analyses

The data were expressed as mean ± standard deviation or n, percentage. The data were analyzed using SPSS software (ver. 13.0). The study groups were compared using the Independent Samples t-test and Chi-square test. Pearson correlation analysis was performed to investigate the relationship between W-DEQ, PAI and BHS scores. $p < 0.05$ was considered statistically

Table 1. Demographic characteristics of the study groups

	Group 1 (n=50)	Group 2 (n=50)	p value
Age (years)	28.96 ± 5.57	27.28 ± 4.24	0.093
BMI (kg/m²)	24.58 ± 1.83	24.70 ± 2.03	0.757
Gestational week	33.16 ± 5.46	32.62 ± 4.99	0.607
Gravida	2.12 ± 1.15	1.90 ± 1.19	0.352

BMI: Body mass index,
Group 1: Participants who had COVID-19 infection during pregnancy.
Group 2: Participants who did not have COVID-19 infection during pregnancy.

Table 2. Childbirth fear scale, Prenatal attachment Inventory and Beck hopelessness Scale scores of the study groups

	Group 1 (n=50)	Group 2 (n=50)	p value
Childbirth Fear Scale score	83.70 ± 11.98	48.10 ± 14.91	<0.001*
Prenatal Attachment Inventory score	57.00 ± 13.04	65.42 ± 8.91	<0.001*
Beck Hopelessness Scale score	5.38 ± 5.82	3.24 ± 2.99	0.023*

*: p<0.05.
Group 1: Participants who had COVID-19 infection during pregnancy.
Group 2: Participants who did not have COVID-19 infection during pregnancy

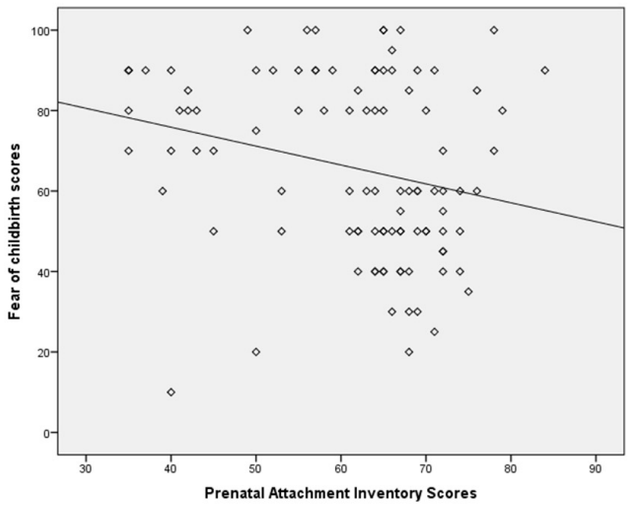


Figure 1. Negative correlation between childbirth fear and prenatal attachment score (r= -0.250, p = 0.012).

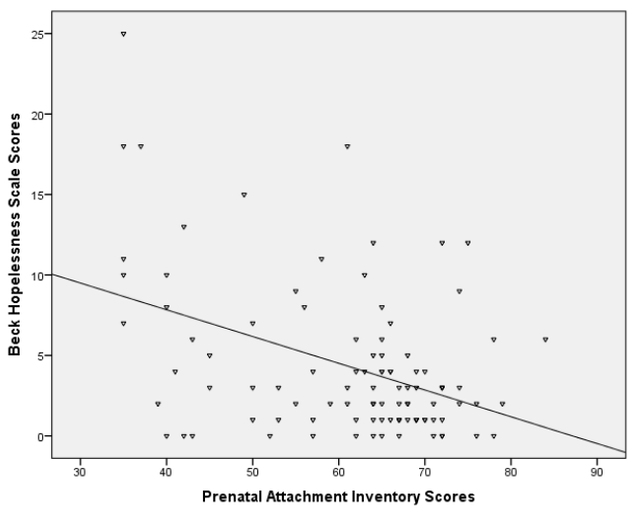


Figure 2. Negative correlation between Beck Hopelessness score and prenatal attachment score (r= -0.416, p < 0.001).

significant.

Results

A total of 100 pregnant women, i.e., 50 people in each group, were included in the study. The groups were demographically similar (Table 1).

It was found that the level of birth fear in patients who had COVID-19 infection during pregnancy was significantly higher than in those who did not (p < 0.001). In addition, prenatal attachment levels were significantly lower in patients with COVID-19 infection during pregnancy compared to those without the infection (p < 0.001). The patients with COVID-19 infection during pregnancy had a higher Beck Hopelessness Scale score than the patients who did not have the infection (p = 0.023) (Table 2). A patient who participated in the study and had COVID-19 infection had shortness of breath that required her to be admitted to the Intensive Care Unit, and most patients (n = 29, 58%) had mild flu infection. No patients required antiviral or steroid use. Based on Pearson's correlation analysis, a negative relationship was observed between childbirth fear and prenatal attachment scores (r= -0.250, p = 0.012) (Figure 1).

There was no correlation between Beck's Hopelessness Scale and childbirth fear scores (r = 0.168, p = 0.095). However, there was a negative correlation between Beck's Hopelessness Scale and Prenatal Attachment scores (r= -0.416, p < 0.001) (Figure 2).

Discussion

While giving birth and transitioning to parenting is a happy life event, it can also be described as a stressful experience. During COVID-19 pandemic, pregnancy and birth management have gained importance. The COVID-19 pandemic is a stressor creating a fear of infection in the pregnant woman. This situation leads pregnant women to an intense isolation, causing them feel unsafe. Besides, difficulties encountered in reaching professionals such as midwives and obstetricians have resulted in a decrease in the level of access to health services by pregnant women. This produced increased fear and anxiety of childbirth in pregnant women [14]. It was stated that pregnant women with social support who could reach health professionals had lower fear of childbirth, lower levels of anxiety experienced during pregnancy and higher prenatal attachment rates, and they adapted more easily to the role of motherhood in the postpartum period [15]. In the present study, we observed that the levels of childbirth fear and the helplessness feeling were higher in pregnant women with COVID-19 disease than in pregnant women who did not have the disease. On the other hand, prenatal attachment level was higher in patients who did not have the infection. It was found that prenatal attachment level had negative correlations with levels of childbirth fear and hopelessness feeling.

Fear of childbirth is a common condition experienced by pregnant women. The person who encounters a frightening situation is distracted, focuses on the factor that causes the threat, and his/her anxiety increases. Such a condition leads a pregnant woman into a negative mood and makes her think that she cannot complete the birth successfully. This vicious

cycle leads to negative expectations [4]. A study examining the effect of childbirth fear on the birth process showed that those who had fear of childbirth had a longer birth process, and they more likely needed epidural anesthesia, induction, instrumental delivery and emergency cesarean delivery needs [16]. In a literature review on pregnancy fear, Aksoy [4] stated that infection during pregnancy increased anxiety and childbirth fear of the mother. The fact that the COVID-19-related problems that infected pregnant women may face were not fully known has been shown to cause increased anxiety and childbirth fear due to the effects on health of both their own and their babies [14]. A study evaluating women with and without COVID-19 infection during the pandemic indicated that women who had the infection had higher levels of childbirth fear and anxiety [17]. In line with the results of that study, we observed that the levels of hopelessness and childbirth fear in pregnant women who had COVID-19 infection were higher than in those who did not have the infection.

The COVID-19 pandemic is an international public health emergency affecting the whole world. It was shown that COVID-19 infection led to increased anxiety levels among pregnant women [18]. During the COVID-19 pandemic, social distancing was encouraged all over the world to reduce interactions between people and thus reduce the likelihood of new infections. This has reduced or altered people's daily activities and led to different levels of psychological pressure that can trigger feelings of loneliness and helplessness or various emotional states such as stress, irritability, physical and mental fatigue, and despair [19]. While depression scores were found similar in both sexes, rates of depression, anxiety and hopelessness were significantly higher in pregnant women [18]. A Canadian study on pregnant women reported that 37 % and 57% of pregnant women experienced clinically severe symptoms of depression and anxiety, respectively [20]. In addition, a study conducted in the United States dealing with women in the perinatal period reported that 36% had high levels of depression and 23% felt hopeless [21]. These findings showed that pregnant women experienced high levels of depression and anxiety after the first days of pandemic compared to the pre-pandemic period. Depression, anxiety and stress experience during pregnancy can cause maternal and fetal health problems in the long term. Mental problems, especially anxiety, despair and depression, was reported to increase pregnancy complications, negatively affect fetal health, and cause low birth weight, premature birth and intrauterine developmental retardation [22]. Therefore, there is an urgent need to understand how the COVID-19 pandemic affects pregnant women and to prevent the occurrence of secondary health problems for them and for their unborn children. In the present study, it was observed that the level of hopelessness was significantly higher among pregnant women with COVID-19 infection compared to pregnant women who did not have the infection.

In the prenatal period, the connection between the mother and fetus forms the main basis of attachment. This plays a decisive role in the relationship between mother and child in the postpartum period. Research showed that the mother's attachment to her child begins long before birth [23]. Although the mental health of pregnant women is considered as the most important factor affecting prenatal attachment during this developmentally critical period, the physiological condition of the expectant mother in this process and the methods of coping with the stress associated with the diseases that occur during pregnancy are also important factors that are effective in establishing this bond. Kurt et al. stated in their study that in pregnant women who had COVID-19, the anxiety and depression levels were high, and the prenatal attachment rate was low [24]. Tanaçan et al. reported that infection of mother with COVID-19 during pregnancy increased the level of hopelessness, anxiety and depression and decreased the level of prenatal attachment [25]. In line with these results, we observed that the level of childbirth fear and hopelessness were higher in pregnant women who had COVID-19 infection. Besides, we found that prenatal attachment had negative correlations with childbirth fear and hopelessness feeling.

In our literature survey, we did not find any other studies investigating the level of childbirth fear in pregnant women with COVID-19 infection. Our study is important for the literature in terms of presenting new findings. The relatively small number of patients included in the study was the main limitation.

Conclusion

COVID-19 infection during pregnancy increases the level of childbirth fear and despair and reduces the level of prenatal attachment in pregnant women. As the level of childbirth fear and/or despair increases in pregnant women, prenatal attachment levels decrease. Prospective studies involving higher number of pregnant women are needed in this regard. Social and psychologic support should be provided to reduce the level of childbirth fear and helplessness feeling in pregnant women infected with COVID-19. In addition, pregnant women should be informed about prevention methods against COVID-19 infection.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Funding: *None*

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

References

1. Zengin H, Bafali IO, Caka SY, Tiryaki O, Cinar N. Childbirth and postpartum period fear and the related factors in pregnancy. JCPSP. 2020;30(2):144-8

2. Sydsjö G, Angerbjörn L, Palmquist S, Bladh M, Sydsjö A, Josefsson A. Secondary fear of childbirth prolongs the time to subsequent delivery. Acta Obstet Gynecol Scand. 2013;92(2):210-4.

3. Ansari A, Irum S. Association of fear of childbirth with the preference for cesarean section; A cross sectional study. PAFMJ. 2022;72(2):535-8.

4. Aksoy AN. Doğum Korkusu: Literatür Değerlendirmesi (Fear of Birth: Literature Review). ODÜ Tıp Dergisi. 2015;2(3):161-5. Turkish.

5. Müller ME, Ferketich S. Factor analysis of the maternal fetal attachment scale. Nurs Res. 1993;42(3):144-7.

6. Kartal AY, Karaman T. Doğuma hazırlık eğitiminin gebelerde prenatal bağlanma ve depresyon riski üzerine etkisi (The effect of birth preparation education on prenatal attachment and depression risk in pregnant women). Zeynep Kamil Tıp Bülteni/ Zeynep Kamil Medical Bulletin. 2018;49(1):85-91.

7. Novoa RH, Quintana W, Llancarí P, Quispe KU, Ríos ER, Ventura W. Maternal clinical characteristics and perinatal outcomes among pregnant women with coronavirus disease 2019. A systematic review. Travel Med Infect Dis. 2021;39:101919.
8. Chen L, Li Q, Zheng D, Jiang H, Wei Y, Zou L, at al. Clinical Characteristics of Pregnant Women with Covid-19 in Wuhan, China. N Engl J Med. 2020;382(25):100
9. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol. 1998;19(2):84-97
10. Korukcu O, Kukulu K, Firat MZ. The reliability and validity of the Turkish version of the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) with pregnant women. J Psychiatr Ment Health Nurs. 2012;19(3):193-202. Turkish.
11. Yılmaz S, Kızılkaya Beji N. Prenatal Bağlanma Envanteri' nin Türkçe' ye uyarlanması; Güvenilirlik ve geçerlilik çalışması (Adaptation of Prenatal Attachment Inventory into Turkish; Reliability and validity study). Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi/ Anatolian Journal of Nursing and Health Sciences. 2013;16(2): 103-9.
12. Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: the hopelessness scale. J Consult Clin Psychol. 1974; 42(6):861-5.
13. Dilbaz N, Seber G. Umutsuzluk kavrami: Depresyon ve intiharda önemi (The concept of hopelessness: Its importance in depression and suicide). Kriz Dergisi/ Crisis Journal. 1993;1(3):134-8.
14. Lok KY, Ko RWT, Fan HSL, Wong JY, Choi EP, Shek NWM, at al. International survey on fear and childbirth experience in pregnancy and the postpartum period during the COVID-19 pandemic: study protocol. BMJ Open. 2021;11(8):050132.
15. Mermer G, Bilge A, Yücel U, Çeber E. Gebelik ve doğum sonrası dönemde sosyal destek algısı düzeylerinin incelenmesi (Investigation of social support perception levels during pregnancy and postpartum period). Psikiyatri Hemşireliği Dergisi/ Journal of Psychiatric Nursing. 2010;1(2):71-6.
16. Adams SS, Gran ME, Eskild A. Fear of childbirth and duration of labour: a study of 2206 women with intended vaginal delivery. BJOG. 2012; 119(10):1238-46.
17. Ilska M, Zaleska AK, Salmeri AB, Preis H, Lobel M. Pandemic-related pregnancy stress assessment-Psychometric properties of the Polish PREPS and its relationship with childbirth fear. Midwifery. 2021;96:102940.
18. Argüder E, Kılıç H, Civak M, Kacar D, Kaya G, Yılmaz A, at al. Covid-19 enfeksiyonu nedeniyle hastanede yatan hastalarda anksiyete ve depresyon düzeyleri (Anxiety and depression levels in hospitalized patients due to Covid-19 infection). Ankara Med J. 2020; 20(4): 971-81.
19. İhsan O, Demirel Ö.F. COVID-19 ve psikiyatrik bozukluklar (COVID-19 and psychiatric disorders). Medical Research Reports 2020; 3(Special issue): 86-99.
20. Mullins E, Evans D, Viner RM, O'Brien P, Morris E. Coronavirus in pregnancy and delivery: rapid review. Ultrasound Obstet Gynecol. 2020;55(5):586-92
21. Khan S, Peng L, Siddique R, Nabi G, Xue NM, Liu J, at al. Impact of COVID-19 infection on pregnancy outcomes and the risk of maternal-to-neonatal intrapartum transmission of COVID-19 during natural birth. Infect Control Hosp Epidemiol. 2020;41(6):748-50.
22. Altın GE. Perinatal depresyon tedavisinde kişilerarası psikoterapi (Interpersonal psychotherapy in the treatment of perinatal depression). Psikiyatride Güncel Yaklaşımlar/ Current Approaches in Psychiatry. 2012;4(2):188-203.
23. Elkin N. Gebelerin prenatal bağlanma düzeyleri ve bunları etkileyen faktörler (Prenatal attachment levels of pregnant women and factors affecting them). STED/Sürekli Tıp Eğitimi Dergisi/ /Journal of Continuing Medical Education.. 2015; 24(6): 230-6.
24. Kurt A, Söyler HÇ. Covid-19 döneminde doğum yapan kadınlarda maternal bağlanma obsesif kompülsif bozukluk ve perinatal anksiyete ilişkisi (The relationship between maternal attachment, obsessive compulsive disorder and perinatal anxiety in women who gave birth during the covid-19 period). Sosyal, Beşeri ve İdari Bilimler Dergisi/ Journal of Social, Humanities and Administrative Sciences. 2022; 5(3): 225-35.
25. Tanacan A, EROL SA, Yücel A. COVID-19 pandemisi döneminde riskli gebe izlemi ve yönetimi (Follow-up and management of risky pregnant women during the COVID-19 pandemic). Jinekoloji-Obstetrik ve Neonatoloji Tıp Dergisi/ Journal of Gynecology-Obstetrics and Neonatology Medicine. 2020; 17(2):378-87.

How to cite this article:
Eda Bingül, Bakiye Akbaş, Berna Aşır, Selvihan Tapanoğlu Karaca, Sibel Ejder Tekgündüz, Ayşe Nur Aksoy. *The effect of COVID-19 infection in pregnancy on childbirth fear and prenatal attachment level in pregnant women: A survey study. Ann Clin Anal Med 2022; DOI: 10.4328/ACAM.21255*