

Article

The correlation between fear of infection with coronavirus disease 2019 and the mental health of pregnant women

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Abstract

Background: Pregnancy is a physiological phenomenon accompanied by numerous physical and psychological changes. Fear of contracting diseases such as coronavirus disease 2019 (COVID-19) or other illnesses for which scientific knowledge is still incomplete can create anxieties in pregnant women, impacting their mental health.

Objectives: The present study aimed to determine the association between fear of infection with COVID-19 and the mental health of pregnant women.

Methods: A cross-sectional study was conducted on 164 pregnant women attending Ayatollah Mousavi Hospital in Zanjan, Iran, in 2021. Participants were randomly selected. Data were collected using demographic questionnaires, the Depression, Anxiety, and Stress Scale (DASS-21), and the Fear of Disease Coronavirus Scale (FDSCS). Data were analyzed using Spearman's correlation coefficient and simple linear regression in SPSS 21 software.

Results: Results demonstrated that 23.4% of participants experienced anxiety, 18.2% experienced depression, and only 1.2% experienced stress. Fear of infection was positively and significantly correlated with anxiety ($r = 0.18, p = 0.01$). Additionally, income adequacy ($r = -0.24, p = 0.002$), perceived economic status ($r = -0.16, p = 0.04$), and spousal support ($r = -0.19, p = 0.01$) were also negatively and significantly correlated with fear of infection.

Conclusion: Findings reveal that the COVID-19 pandemic can culminate in fear and anxiety in pregnant women. Spousal support during this sensitive period and feelings of marital satisfaction can relieve anxiety in women.



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Implications of this paper in nursing and midwifery preventive care:

- The current study demonstrates that fear of contracting diseases such as COVID-19 is associated with the mental health of pregnant women. Moreover, family support, particularly from husbands, can mitigate this fear among this population. Thus, it is crucial for medical staff, particularly midwives, to pay attention to psychological issues, in addition to physical care, during this sensitive period.
- Encouraging men to provide emotional and psychological support to their wives, particularly during pregnancy, can help maintain and improve the mental health of women who are raising the next generation.

Introduction

In December 2019, the first reports of the coronavirus disease 2019 (COVID-19) outbreak emerged from Wuhan, China, which soon spread to other Chinese cities and countries [1]. The speed of the outbreak and the resulting mortality rate were such that by April 15, 2020, approximately 2 million people had been infected with the disease and over 120,000 deaths had been reported [2]. Consequently, the World Health Organization (WHO) imposed strict health

and safety measures to control the disease, initially involving home quarantines, adherence to personal hygiene, and special attention to vulnerable individuals, including pregnant women [3].

Pregnancy is a natural and unique process accompanied by physical, familial, and social changes. These physiological changes alone can impact women's mental health, making them more vulnerable than others. Exposure to factors such as unexpected or emerging diseases can

threaten both the physical and mental health of mothers [4-7].

Mental health, a fundamental right of all humans, is crucial for personal, social, and economic development. Mental health enables individuals to cope with life's stresses [8]. One stressor that has been in the spotlight in recent years is the COVID-19 pandemic, which, as mentioned, has culminated in numerous infections and deaths. Due to the emergence of new variants, this disease continues to pose a serious threat. Available information has shown that due to a physiological decrease in immune system function during pregnancy, pregnant women and their fetuses are at increased risk of adverse outcomes from contracting this disease [9].

Previous studies on the mental health of pregnant women have demonstrated that disorders such as depression and anxiety are prevalent during pregnancy. Moreover, the added stress of emerging a new disease, particularly the uncertainty about its effects on one's own health, that of loved ones, the fetus, and its long-term consequences on the child's future health, imposes additional psychological pressure on the mother [10,11]. All of these factors can contribute to complications such as preterm birth, low birth weight, intrauterine growth restriction, and postpartum depression [10,12]. Moreover, feelings of loneliness due to social restrictions can make them more vulnerable. For instance, during the initial phase of the severe acute respiratory syndrome (SARS) outbreak in 2003, a wide range of psychiatric disorders, including depression, anxiety, panic attacks, and even suicide, increased [2,13].

Therefore, since the onset of the COVID-19 pandemic, the WHO has considered pregnant women as a vulnerable group for contracting this disease. Moreover, it emphasized the importance of paying attention to mental health in this group of women [3]. Consequently, researchers worldwide have begun conducting studies on various physical and psychological aspects of the disease in pregnant women [14,15]. However, due to the novel nature of the disease and the limited number of studies conducted in this area, more comprehensive research and investigations are still necessary. Hence, the researchers in this study decided to conduct a study aiming to explore the relationship between fear of infection

with COVID-19 and the mental health of pregnant women attending Ayatollah Mousavi Hospital in Zanjan in 2021. It is worth mentioning that this research was conducted before the widespread COVID-19 vaccination.

Methods

This cross-sectional descriptive study was conducted between April and July 2021 at Ayatollah Mousavi Hospital in Zanjan (the only referral hospital in the province). The study population consisted of all pregnant women attending the mentioned hospital. After obtaining ethical approval (IR.SBMU.RETECH.REC.1399.814), the researcher visited the prenatal clinic, inpatient ward, and delivery ward and, after explaining the research objectives and obtaining written informed consent from the participants, completed the relevant questionnaires. The researcher randomly visited the research setting on even days and selected individuals who desired to participate and met the inclusion criteria. The inclusion criteria included intrauterine pregnancy, absence of any type of hypertension, diabetes, placenta previa, threatened abortion, preterm childbirth, and encountering traumatic events (death of loved ones, divorce, etc.) in the past two months. The exclusion criterion included incompleteness of 20% of the questionnaire questions by the individuals. The minimum sample size, considering $\alpha=0.05$, $\beta=0.1$, and $r=0.3$ (correlation between the score of fear of infection with COVID-19 and anxiety based on 16. Munro's reference 0.3 [16]), was estimated to be 120, which was determined to be 144 after considering a 20% dropout rate. In total, 200 people were interviewed, and 170 people entered the study, of which 6 were excluded due to incompleteness of more than 20% of the questionnaire questions. Finally, the data of 164 people were analyzed.

Data Collection Tools

The Demographic Questionnaire

Consistent with similar studies, the demographic questionnaire included questions about the ages and education levels of the woman and her spouse, the woman's occupation, place of residence (urban or rural), satisfaction with marital life, level of spousal support, income adequacy, and perceived economic status [4,17].

The Fear of Disease Coronaviruses Scale (FDCS)

This scale consists of 5 items designed and standardized to measure fear of infection with COVID-19 in adults. It is scored on a 5-point Likert scale (1= very low, 2 = low, 3 = moderate, 4=high, and 5=very high). The total score ranges from 5 to 25, with higher scores denoting greater fear of infection with COVID-19. In a psychometric study by Veisi et al, the validity and reliability of this questionnaire were evaluated and confirmed [18]. Convergent validity with the Dark Future Scale (DFS) by Zalasky et al, (2019) showed a Pearson's correlation coefficient of 0.59, and with the Thanatophobia Scale (TS) by Veisi et al, (2019), showed a Pearson's correlation coefficient of 0.58, both at the 0.05 significance level. Additionally, Cronbach's alpha of 0.81 indicated the internal consistency of this questionnaire [19]. In this study, Cronbach's alpha was calculated to be 0.87.

The Depression, Anxiety and Stress Scale-21 Items (DASS-21)

This questionnaire was developed by Lovibond in 1995. The reliability of the DASS, calculated using Cronbach's alpha, is acceptable for all three subscales of depression, anxiety, and stress, with coefficients of 0.91, 0.84, and 0.90 respectively [20]. This 21-item questionnaire uses 7 questions on a Likert scale for each of the depression, anxiety, and stress subscales (not at all, low, moderate, and high). The minimum score for each item is 0, and the maximum is 3. Scoring for depression is as follows: Normal (0-9), mild (10-13), moderate (14-20), severe (21-27), and very severe (>28); scoring for stress is as follows: Normal (0-14), mild (15-18), moderate (19-25), severe (26-33), and very severe (>34); scoring for anxiety is as follows: Normal (0-7), mild (8-9), moderate (10-14), severe (15-19), and very severe (>20). This questionnaire has been extensively employed in various research studies both

domestically and internationally, and its validity and reliability have been confirmed. Sahebi et al, reported a correlation of 0.7 between this test and the Beck Depression Inventory, 0.67 with the Zung Anxiety Test, and 0.49 with the Perceived Stress Scale. The internal consistency of this scale, as measured by Cronbach's alpha, was reported as 0.77 for the depression subscale, 0.79 for the anxiety subscale, and 0.78 for the stress subscale [21]. In the current study, Cronbach's alphas for the stress, anxiety, and depression subscales, as well as the total questionnaire were 0.85, 0.85, 0.87, and 0.93, respectively.

The normality of quantitative variables was assessed using the Kolmogorov-Smirnov test (K-S). Due to the non-normal distribution of stress, the anxiety, depression, and fear of infection with COVID-19 variables, Spearman's correlation coefficient and linear regression were employed for data analysis. Data were analyzed using SPSS version 20, and a p-value less than 0.05 was considered statistically significant.

Results

This study comprised 164 pregnant women (mean age= 26.76 ± 6.87 years). The majority of participants (56.7%) and their spouses (51.2%) were under diploma, and most (59.8%) resided in urban areas. The majority of them (61%) reported a moderate level of income and a perceived economic status (51.8%). The level of spousal support (36.6%) and marital satisfaction (45.1%) was moderate for most participants. In addition, the majority of pregnancies were planned (80.5%). The majority of participants were in their first pregnancy (41.5%) and were over 28 weeks pregnant (66.7%). Fear of infection with COVID-19 was higher than moderate among participants (mean and standard deviation of 16.62 (4.51) (Table 1). A vast majority (98.8%) reported no stress, 76.6% reported no anxiety, and 81.8% reported no depression (Table 2).

Table 1: Demographic characteristics of pregnant women participating in the study (N=164)

Quantitative variable		Mean (SD)	Min-Max
Age (year)		26.76(6.87)	15-45
Spouse's age (year)		31.9(6.58)	19-52
Fear of COVID-19 (FDCS)		16.62(4.51)	5-25
Qualitative variable		N (%)	
Education	Under diploma	93 (56.7)	
	Diploma	34 (20.7)	
	University	37 (22.6)	
Spouse's education	Under diploma	84 (51.2)	
	Diploma	35 (21.3)	
	University	45 (27.4)	
Place of residence	Rural	66 (40.2)	
	Urban	98 (59.8)	
Job	Housewife	150 (91.5)	
	Employee	14 (8.5)	
Spouse's job	Unemployed	5 (3)	
	Employee	34 (20.7)	
	Other	125 (76.2)	
Satisfaction with income	No	44 (26.8)	
	Moderate	100 (61)	
	Excellent	20 (12.2)	
Perceived economic level	Low	47 (28.7)	
	Moderate	85 (51.8)	
	Good	29 (17.7)	
	Excellent	3 (1.8)	
Spousal support	Low	21(12.8)	
	Moderate	60 (36.6)	
	High	50 (30.5)	
	Very high	33 (20.1)	
Marital satisfaction	Low	11 (6.7)	
	Moderate	74 (45.1)	
	High	47 (28.4)	
	Very high	32 (20)	
Number of pregnancies	1	68 (41.5)	
	2	44 (26.8)	
	≥3	52 (31.7)	
	<14	6(3.6)	
Gestational age	14-28	49 (30.2)	
	>28	109 (66.7)	
Planned pregnancy	Yes	132 (80.5)	
	No	32 (19.5)	

SD: Standard deviation; Min: Minimum; Max :Maximum; COVID-19: Coronavirus disease 2019; FDCS: The Fear of Disease Coronaviruses Scale

Table 2: Mental health characteristics of pregnant women participating in the study

Depression	Normal	133 (81.1)
	Mild	29 (17.7)
	Moderate	2 (1.2)
	Mean (SD)	4.53 (4.29)
Anxiety	Normal	126 (76.8)
	Mild	9 (5.5)
	Moderate	29 (17.7)
	Mean (SD)	4.52 (4.01)
Stress	Normal	162 (98.8)
	Mild	2 (1.2)
	Moderate	5.76 (4.35)
	Mean (SD)	

SD: Standard deviation

This study found that the level of fear of infection with COVID-19 had a positive and significant

correlation with anxiety ($r= 0.18, p= 0.01$) and no significant correlation with other components of

mental health, such as stress and depression ($p>0.05$). Additionally, fear of infection with COVID-19 had negative and significant correlations with income adequacy ($r=-0.24$, $p=0.002$), perceived economic status ($r= -0.16$, $p=0.04$), and spousal support ($r= -0.19$, $p=0.01$). This means that fear of infection with COVID-19 increases at lower income levels of lower perceived economic status, inadequate spousal

support, and marital dissatisfaction. This study demonstrated that fear of infection with COVID-19 was not correlated with the ages and education levels of the woman or her spouse, place of residence (urban or rural), the woman's occupation (employed, housewife), or the spouse's occupation (unemployed, laborer, employee, other) ($p> 0.05$) (Table 3).

Table 3: Spearman's correlation between fear of infection with coronavirus disease 2019 and demographic variables, economic status, mental health, spousal support and marital satisfaction

Variables	r	p
DASS-21 score	0.11	0.13
Depression	0.11	0.13
Anxiety	0.18	0.01
Stress	0.07	0.34
Is your monthly income enough?	-0.24	0.002
Perceived economic level	-0.16	0.04
Spousal support	-0.19	0.01
Marital satisfaction	-0.07	0.34
Age	-0.13	0.08
Spouse's age	-0.12	0.11
Education level	-0.062	0.42
Spouse's education level	-0.1	0.18
Place of residence	-0.06	0.44
Job	-0.11	0.15
Spouse's job	0.006	0.93

Given the significant correlation between fear of infection with COVID-19 and maternal anxiety, linear regression analysis was carried out to explain maternal anxiety. Results revealed that for every one-point increase in fear of infection with COVID-19, while holding other variables constant, the anxiety score increased by 0.13. Similarly, for every one-unit increase in marital

satisfaction, while holding other variables constant, the anxiety score decreased by 0.79. Additionally, for every one-year increase in age difference between the spouse and the wife, while holding other variables constant, the anxiety score decreased by 0.18. This model explained 9% of the variance in the changes in the anxiety score (table 4).

Table 4: The results of linear regression to determine the factors affecting the anxiety of pregnant mothers

Variable	B	SE	β	p	R ²
Fear of COVID-19 score	0.137	0.067	0.158	0.04	0.09
Marital satisfaction	-0.79	0.35	-0.17	0.024	
Age difference with spouse	-0.18	0.09	-0.16	0.04	
Education level difference	0.063	0.099	0.05	0.52	

COVID-19: Coronavirus disease 2019

Discussion

The present research was designed and conducted to determine the relationship between fear of infection with COVID-19 and the mental health of pregnant women attending Ayatollah Mousavi

Hospital in Zanjan in 2021. The results of this study revealed that the level of fear of infection with COVID-19 was higher than moderate in pregnant women, and this fear had a positive and significant correlation with their anxiety levels. In

line with this study, Durmuş et al, (2022) also conducted a study to determine the relationship between fear of infection with COVID-19 and anxiety. This study was conducted at a similar time and in a similar cultural context as the current study. In their study, the level of fear of infection with COVID-19 was also higher than moderate in pregnant women, and this fear culminated in an increase in anxiety scores among them. This study demonstrated a significant correlation between fear of infection with COVID-19 and anxiety. This finding may be attributed to a lack of information about the prevalence and complications of this new pandemic [22]. Similarly, Ahorsu et al, (2020) study on some pregnant women and their partners reported that fear of infection with COVID-19 had a positive correlation with depression and suicidal ideation in pregnant women, but no correlation with anxiety levels. However, an analysis of the impact of fear on depression and anxiety levels in the women's spouses indicated that fear of infection with COVID-19 was directly related to increased anxiety levels in addition to increasing depression and suicidal thoughts [23]. The differences between the results of the present study and those of Ahorsu's research may be attributed to differences in certain factors that sometimes underlie some psychological problems. These factors may include age, education level, and, in particular, whether the pregnancy was planned or unplanned. In the present study, compared to Ahorsu's study, most participants had a planned pregnancy. Also a direct relationship between women's mental health and attachment to the fetus has been observed in Russo's et al, study (2014) [24], it is possible that the fear experienced by pregnant women due to contracting COVID-19 and its potential impacts on the health of their fetus has been a significant factor in increasing their anxiety scores.

Regarding the relationship between fear of infection with COVID-19 and levels of depression and stress, no increase was observed in scores for these disorders in the present study. In a study conducted by Giesbrecht et al, (2022) on 9251 Canadian pregnant women, it was shown that during the COVID-19 pandemic, the mean scores for fear of infection with COVID-19 were higher than moderate, and this fear was associated with increased levels of depression and anxiety [25].

The results of Giesbrecht's study were consistent with the present study regarding the increase in fear due to COVID-19 and its impact on anxiety levels in pregnant women but were inconsistent regarding the relationship between fear and depression. This difference in depression scores may be due to differences between the two populations in terms of culture and the prevalence of the disease at the time of the study. In a study by Bolkin et al, (2021) aimed at describing changes in mental disorders, including anxiety, depression, and stress, during the COVID-19 pandemic compared to the pre-pandemic period, it was shown that anxiety disorders had increased in younger individuals during the COVID-19 pandemic, but depression and stress scores were not affected [26]. This study was conducted at the end of 2020, approximately nine months after the first quarantine period, which was roughly similar to the timing of the present study and was also consistent with the results of the present study in terms of anxiety and depression scores. Regarding the comparison of indicators related to fear, anxiety, and depression in several studies, it has been pointed out that anxiety disorders often precede depressive disorders, and fear usually appears two years earlier than depression [27,28]. Since the present study was conducted during the onset of the COVID-19 pandemic, it is possible that this issue caused a lack of correlation between fear and depression.

The present study revealed that fear of infection with COVID-19 had a negative correlation with levels of spousal support and marital satisfaction. In other words, women who received adequate spousal support and had higher levels of marital satisfaction experienced less fear of infection with COVID-19. Consistent with our study, Ahorsu et al, (2020) also investigated the impact of a positive mental image of quality of life on the level of fear of infection with COVID-19 in a group of pregnant women and their spouses. They reported that, in addition to reducing the individual's fear of infection with COVID-19, a positive mental image also impacted reduced fear of the spouse (both pregnant women and their spouses) [23]. Furthermore, this study demonstrated that women who received adequate support from their spouses experienced lower levels of anxiety. Specifically, for every one-unit increase in marital satisfaction, anxiety scores

decreased by 0.79. This finding is consistent with numerous other studies that have highlighted the significant impact of marital satisfaction on reducing women's fear and anxiety [4,29,30].

Regarding the impact of income adequacy and perceived economic status on the level of fear of infection with COVID-19, the present study revealed that women with lower income levels experienced higher levels of fear. This finding was inconsistent with Durmuş's (2022) study. Their study reported no correlation between income status and the level of fear of infection with COVID-19 [22]. This discrepancy between the present research and Daramos' study may be due to the fact that no single and specific criteria were used to assess income status in the two studies, as well as individuals' perceptions of their economic status differed. Another reason for this difference in the results reported by the two studies may be the variation in the amount of out-of-pocket expenses for receiving services in different societies. Consistent with the present study, Giesbrecht et al, (2022) also reported an inverse relationship between income level and the level of fear of infection with COVID-19 [25].

Based on the results of this study, fear of infection with COVID-19 is associated with maternal anxiety levels. This may be exacerbated by the unknown nature of the virus. Since data collection in this study was conducted before widespread vaccination, it is possible that differences in fear levels and other variables between participants in our study and other studies were influenced by this factor. Additionally, the present study demonstrated that increased marital satisfaction and spousal support can be associated with decreased fear of COVID-19 among pregnant women. This issue is particularly important during the COVID-19 pandemic when individuals are spending more time at home and in quarantine. Focusing on enhancing marital satisfaction, both in terms of national health policies and through conducting intervention studies, particularly during pandemics like COVID-19, can improve the mental health of families and society.

Conclusion

Based on the results of this study, it can be concluded that certain social factors, such as the emergence of an unknown disease like COVID-

19, can culminate in fear and anxiety in pregnant women. Given that spousal support can reduce fear levels, this issue should be emphasized in training for couples. Future research should evaluate the long-term effects of fear, particularly its relationship with depression, and the role of spousal support in preventing or reducing psychological disorders.

Ethical Consideration

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1399.814), and written informed consent was obtained from all participants before entering the study.

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Conflict of interest

No conflict of interest.

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Authors' contributions

Fatemeh Bayat and Sepideh Din Mohammadi: Research implementation and writing; Giti Ozgoli: Research development and revision; Shabnam Tofighi: Data collection; Maliheh Nasiri: Data analysis and presentation of the final results. All authors approved the final version of the manuscript.

References

1. Poon LC, Yang H, Dumont S, Lee JC, Copel JA, Danneels L, Wright A, Costa FD, Leung TY, Zhang Y, Chen D. ISUOG Interim Guidance on coronavirus disease 2019 (COVID 19) during pregnancy and puerperium: information for healthcare professionals—an update. *Ultrasound in Obstetrics & Gynecology*. 2020; 55(6):848. <https://doi.org/10.1002/uog.22061>
2. Li N, Han L, Peng M, Lv Y, Ouyang Y, Liu K, Yue L, Li Q, Sun G, Chen L, Yang L. Maternal and neonatal outcomes of pregnant women with coronavirus disease 2019 (COVID-19) pneumonia: a case-control study. *Clinical infectious*

- diseases. 2020;71(16):2035-41. <https://doi.org/10.1093/cid/ciaa352>.
3. World Health Organization. Maternal mental health. Updated 24 June 2019. Available online at: <https://www.who.int/teams/mental-health-and-substance-use/promotion-prevention/maternal-mental-health>
 4. Effati-Daryani F, Zarei S, Mohammadi A, Hemmati E, Ghasemi Yngyknd S, Mirghafourvand M. Depression, stress, anxiety and their predictors in Iranian pregnant women during the outbreak of COVID-19. BMC psychology. 2020;8:1-0. <https://doi.org/10.1186/s40359-020-00464-8>.
 5. Silva MM, Nogueira DA, Clapis MJ, Leite EP. Anxiety in pregnancy: prevalence and associated factors. Revista da Escola de Enfermagem da USP. 2017;51:e03253. <http://dx.doi.org/10.1590/S1980-220X2016048003253>.
 6. Cai C, Busch S, Wang R, Sivak A, Davenport MH. Physical activity before and during pregnancy and maternal mental health: A systematic review and meta-analysis of observational studies. Journal of affective disorders. 2022;309:393-403. <http://doi.org/10.1016/j.jad.2022.04.143>.
 7. Zemorshidi M, Ghomian N, Khadem-Rezaiyan M. The Ratio of Severe Maternal Outcome and its Related Factors in an Academic Hospital from October 2019 to October 2020. Iranian Journal of Obstetrics, Gynecology, and Infertility, 2022; 25(3): 60-68. <https://doi.org/10.22038/ijogi.2022.20425>. [In Persian]
 8. World Health Organization. Mental health. Updated 17 June 2022. Available online at: <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>.
 9. Wali AS, Ali MM, Bibi R, Rahim A. The clinical manifestations and pregnancy outcomes of COVID-19 infection at a tertiary care hospital. Pakistan Journal of Medical Sciences. 2024;40(2ICON Suppl):S15. [https://doi.org/10.12669/pjms.40.2\(ICON\).8949](https://doi.org/10.12669/pjms.40.2(ICON).8949). PMID: 38328663; PMCID: PMC10844904.
 10. Ali NS, Azam IS, Ali BS, Tabbusum G, Moin SS. Frequency and associated factors for anxiety and depression in pregnant women: a hospital-based cross-sectional study. The Scientific World Journal. 2012;2012 (1): 1-9. <https://doi.org/10.1100/2012/653098>.
 11. Giardinelli L, Innocenti A, Benni L, Stefanini MC, Lino G, Lunardi C, Svelto V, Afshar S, Bovani R, Castellini G, Faravelli C. Depression and anxiety in perinatal period: prevalence and risk factors in an Italian sample. Archives of women's mental health. 2012;15:21-30. <https://doi.org/10.1007/s00737-011-0249-8>.
 12. Rondó PH, Ferreira RF, Nogueira F, Ribeiro MC, Lobert H, Artes R. Maternal psychological stress and distress as predictors of low birth weight, prematurity and intrauterine growth retardation. European journal of clinical nutrition. 2003;57(2):266-72. <https://doi.org/10.1038/sj.ejcn.1601526>.
 13. Wu Y, Zhang C, Liu H, Duan C, Li C, Fan J, Li H, Chen L, Xu H, Li X, Guo Y. Perinatal depressive and anxiety symptoms of pregnant women during the coronavirus disease 2019 outbreak in China. American journal of obstetrics and gynecology. 2020;223(2):240-e1. <https://doi.org/10.1016/j.ajog.2020.05.009>.
 14. Wei SQ, Bilodeau-Bertrand M, Liu S, Auger N. The impact of COVID-19 on pregnancy outcomes: a systematic review and meta-analysis. Cmaj. 2021;193(16):E540-8. <https://doi.org/10.1503/cmaj.202604>
 15. Fan S, Guan J, Cao L, Wang M, Zhao H, Chen L, Yan L. Psychological effects caused by COVID-19 pandemic on pregnant women: a systematic review with meta-analysis. Asian journal of psychiatry. 2021;56:102533. <https://doi.org/10.1016/j.ajp.2020.102533>
 16. Munro BH. Statistical methods for health care research. lippincott williams & wilkins; 2005.P.240.URL:<https://www.google.com/books/edition/Statistical-Methods-for-Health-Care-Rese/a34z-Ah2-LgC?hl=en&gbpv=0>.
 17. Ayaz R, Hocaoglu M, Günay T, devrim Yardımcı O, Turgut A, Karateke A. Anxiety and depression symptoms in the same pregnant women before and during the COVID-19 pandemic. Journal of perinatal medicine. 2020;48(9):965-70. <https://doi.org/10.1515/jpm-2020-0380>.
 18. Visi S, Imani S, Behroz B, Imani S. Evaluation of the psychometric properties of the short scale of fear of contracting the coronavirus disease (Covid-19). Journal of New Advances in Behavioral Sciences. 2020;5(42):1-0. URL: <http://ijndibs.com/article-416-1-fa.html>. [In Persian].
 19. Zaleski, Z., Sobol-Kwapinska, M., Przepiorka, A., & Meisner, M. (2019). Development and validation of the Dark Future scale. Time & Society;2019: 28 (1), 107-123. <https://doi.org/10.1177/0961463X16678257>.
 20. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behaviour research and therapy. 1995;33(3):335-43. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U).
 21. Sahebi A, Asghari MJ, Salari RS. Validation of depression anxiety and stress scale (DASS-21) for an Iranian population. URL: <https://www.scienceopen.com/document?vid=7528f000-2e97-4811-8ff0-028faa5b3d8c>. [In Persian]
 22. Durmuş M, ŞENER N, ERSÖĞÜTÇÜ F. The relationship between coronavirus fear and anxiety in pregnant women during COVID-19 outbreak. İnönü Üniversitesi Sağlık Hizmetleri Meslek Yüksek Okulu Dergisi. 2022;10(1):58-72. <https://doi.org/10.51754/cusbed.1333102>
 23. Ahorsu DK, Imani V, Lin CY, Timpka T, Broström A, Updegraff JA, Årestedt K, Griffiths MD, Pakpour AH. Associations between fear of COVID-19, mental health, and preventive behaviours across pregnant women and husbands: an actor-partner interdependence modelling. International Journal of Mental Health and Addiction. 2020:68-82. <https://doi.org/10.1007/s11469-020-00340-x>.
 24. Russo NF. Abortion, unwanted childbearing, and mental health. Salud Mental. 2014;37(4):283-91. URL: <https://www.medigraphic.com/cgibin/new/resumenI.cgi?IDARTICULO=52123>.
 25. Giesbrecht GF, Rojas L, Patel S, Kuret V, MacKinnon AL, Tomfohr-Madsen L, Lebel C. Fear of COVID-19, mental health, and pregnancy outcomes in the pregnancy during the COVID-19 pandemic study: fear of COVID-19 and pregnancy outcomes. Journal of affective disorders. 2022;299:483-91. <https://doi.org/10.1016/j.jad.2021.12.057>.
 26. Bohlken J, Kostev K, Riedel-Heller S, Hoffmann W, Michalowsky B. Effect of the COVID-19 pandemic on stress, anxiety, and depressive disorders in German primary care: A cross-sectional study. Journal of psychiatric research.

2021;143:43-9.

<https://doi.org/10.1016/j.jpsychires.2021.08016>.

27. Kalin NH. The critical relationship between anxiety and depression. *American Journal of Psychiatry*. 2020;177(5):365-7.

<https://doi.org/10.1176/appi.ajp.2020.20030305>.

28. Kessler RC, Wang PS. The descriptive epidemiology of commonly occurring mental disorders in the United States. *Annu. Rev. Public Health*. 2008;29:115-29.

<https://doi.org/10.1146/annurev.publhealth.29.020907.090847>.

29. Işık RA, Kaya Y. The relationships among perceived stress, conflict resolution styles, spousal support and marital satisfaction during the COVID-19 quarantine. *Current Psychology*. 2022; 41(6):3328-38.

<https://doi.org/10.1007/s12144-022-02737-4>.

30. Budiartini NN. Effect of Covid-19 related Stress on Marital Quality during Covid-19 Pandemic. *Psychological Research and Intervention*. 2021;4(1):9-18.

<https://doi.org/10.21831/pri.v4i1.43287>.