Review Article

Mental Health of Iranian Pregnant Women during Pandemic of COVID-19: A Systematic Review

Abstract

Background: An evaluation of Iranian pregnant women's mental health during the COVID-19 outbreak is an ignored issue. The current study aimed to investigate the mental health of Iranian pregnant women during the COVID-19 pandemic. **Materials and Methods:** Literature searching was conducted, and studies were published from 01 March 2020 to 30 June 2022 on PubMed, Scopus, ScienceDirect, SID, and Magiran screened for the relevant articles. **Results:** There was a total of 10 studies included in this systematic review. In the present study, the prevalence of moderate to the high level of depression, anxiety, and stress symptoms was 40%, 19 to 74%, and 70%, respectively. There were some protective factors such as physical activity, social support, using progressive relaxation, and husbands' involvement in caring behaviours of their pregnant wives that can enhance the mental health of Iranian pregnant women during the COVID-19 pandemic. **Conclusions:** Regarding the high prevalence of depression, anxiety, and stress among Iranian pregnant women during the current pandemic, the mental health status of pregnant women should be regularly evaluated and essential educational and interventional programs should be provided for this population.

Keywords: *COVID-19, mental health, pregnant women*

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Introduction

Coronavirus disease 2019 (COVID-19) is a disease caused by a novel coronavirus (2019-nCoV) that was first reported in China in December 2019. Since then, there have been over 545,000,000 cases of COVID-19 infections worldwide, with more than 6,330,000 deaths.[1] COVID-19 has some psychological and social consequences for pregnant women who have considerable limitations in communication with family, relatives, and society around the world including in Iran. Appreciating the importance of maternal psychological health due to the COVID-19 outbreak is essential to prevent the incidence of intense psychological impairments as a secondary outcome during the after giving birth period.[2] Within the present pandemic, the finding of a study in China showed that 53.8% of participants were in moderate or severe mental health problems, of which 17% and 29% had moderate to severe depression and anxiety, respectively.[3] Results of a recent study in Iran revealed that the incidence rate for psychosocial problems was 150.86 and 273.69 per 100,000 people before and during the COVID-19 pandemic, respectively.[4] Research indicated that increased anxiety and depression symptoms during pregnancy might enhance the postpartum depression risk and the rate of illness in infants.[5] Moreover, past studies uncovered that pre-birth anxiety and depression can cause changes in physical movement, nourishment, maternal disposition, and fetal wellbeing which may increment the chance of unsuccessful labor, preterm birth, lower birth weight, and lower Apgar scores at birth.[6-10] Children of mothers who have persevered under long-term stress are at more prominent hazard of ensuing mental well-being issues.[10-14] Pre-birth anxiety and depression are moreover connected with changes in brain advancement and performance in newborns and children.[15-18] These long-enduring mental and neurological impacts emphasize the significance of lightening the alleviating pre-birth inconvenience for both pregnant women and their newborn children. A recent meta-analysis showed that the prevalence of depression during the COVID-19 pandemic is 25%.[19] It is additionally crucial to

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recognize conceivable flexibility components that can offer assistance to protect against high pre-birth distress. Social support may minimize the effect of prebirth distress and appear to decrease the influences of pre-birth stress and depression signs of maternal and newborn inappropriate reactions.[20] Regular physical activity is frequently related to diminished depression and anxiety in pregnant people.[21] Considering the conceivable negative mental influences of mental, well-being, and economic issues related to insecurity coupled with social prohibition, there's an essential need to assess the prevalence of mental problems in pregnant women during this breakout and to provide appropriate education and intervention. Apparently, to date, there is no systematic study on the psychological problems resulting from the COVID-19 outbreak in Iranian pregnant women. The current study concentrates on an increasing body of articles on mental well-being and COVID-19 published after the COVID-19 outbreak in Iran on pregnant women to find factors that can increase/decrease the mental health of them during the recent pandemic. To present a clearer perspective, a systematic review was conducted on recent related research by assessing of anxiety, depression, and stress of pregnant women during the COVID-19 pandemic.

Materials and Methods

The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guideline is followed in the current study.[22] Different databases were searched for published articles in the field. A systematic search was conducted on PubMed, Scopus, ScienceDirect, SID and Magiran (these two databases searched for Persian articles), and other sources (Google Scholar and Google) from 01 March 2020 to 30 June 2022 reported anxiety, depression, stress, and psychological well-being among Iranian pregnant women during the COVID-19 pandemic was conducted. Titles and abstracts of each publication were screened for relevance. Studies were eligible for inclusion if they: (1) followed cross-sectional, descriptive and experimental study design; (2) assessed the mental health status of the Iranian pregnant women during the COVID-19 pandemic; and (3) used standardized and validated scales for measurement. Studies were excluded if they: (1) were not written in English or Persian; (2) the same participants were enrolled in different articles; (3) were commentaries, editorials, case reports, letters to the editor, short communications, conference proceedings, and qualitative studies; and (4) studies without full text.

The suitability of the key terms was checked earlier before searching each database. Example of search line in PubMed: ("Psychology") OR ("Mental Health") OR ("Anxiety") OR ("Depression") OR ("well-being") OR ("Stress") AND ("COVID-19") OR ("novel coronavirus") OR (nCoV) AND ("Iran") AND ("Pregnant Women"). A data extraction checklist was prepared using Microsoft Word 2019, and data were extracted by two investigators (M.T and A.T), independently. The extracted data were cross-checked interchangeably by the two authors and inconsistencies were solved accordingly. Name of the author(s), publication year, sample size, study population, anxiety, depression, stress, and psychological well-being were used in the extraction process. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was used for quality assessment[23] in three categories of low, moderate, and high quality by the authors.

Ethical considerations

Researchers tried to act in an unbiased way to analyze the retrieved data of articles.

Results

Selection of studies

In the initial search, 343 studies were obtained from databases (Scopus: 116, PubMed: 82, ScienceDirect: 133, Magiran: 11, and SID: 1). Primarily, 202 studies were excluded due to duplication. Then, 141 studies were screened using titles and abstracts and 120 were removed. Finally, the full texts of 21 studies were assessed for eligibility. Of the total 21 studies, eventually, 10 eligible studies were used in the final analysis of the current systematic review [Figure 1]. Narrative synthesis method used for data synthesis.

Study characteristics

Of the total of 10 studies included in the final analysis, seven were cross-sectional,[24-30] two were experimental,[31,32] and one was descriptive.[33] Three studies were in Persian.[24,26,32] The sample size of the studies ranged from 60[32] to 560.[33] The mean age of subjects was around 28. The main features of this 10 articles are summarized in Table 1.

Depression among pregnant women

In two studies, depression of pregnant women was directly assessed.[27,29] In Shayganfard et al.[27] study, health anxiety was unrelated to depression or stress. Higher depression was found among subjects who adhered strictly to the rules and felt worried. Participants postponing/cancelling routine medical care appointments had significantly higher depression. In Firouzbakht et al.[29] study about 40% of participants had depression. The coping strategy of avoidance and Corona disease anxiety were significant predictors of depression. There was a significant relationship between depression and COVID anxiety. Age, education, and place of residence predicted depression.

Anxiety among pregnant women

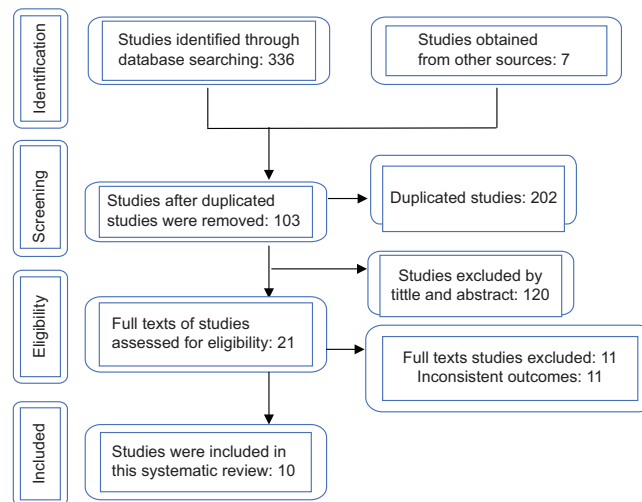In all analyzed studies except one,[33] the different types of anxiety were evaluated. Corona anxiety, health anxiety

Figure 1: PRISMA flow chart showing study selection process

and anxiety in general related studies respectively investigated. Abedzadeh et al.[24] evaluated the perceived Corona-related anxiety of pregnant women. In this study, the reported moderate to severe level of Corona-related anxiety was 50%. There was also a significant relationship between Corona-related anxiety and perceived stress. The anxiety level of pregnant women who use protective equipment (such as masks or gloves) against Corona was more than those who didn't. Pregnant women with low-educated husbands had lower anxiety. Anxiety also was higher among women with low physical activity. Karimi et al.[26] study indicated that 74% of the participant had moderate to high levels of Corona-related anxiety. The most level of anxiety was among pregnant women with poor social support. Also, the mildest anxiety was found in pregnant women who experienced their second pregnancy. In Salehi et al.[28] research, the mental health of pregnant women during pregnancy was significantly correlated with Anxiety of COVID-19. Firouzbakht et al.[29] demonstrated that about 19% of participants had COVID anxiety and as noted before, there was a significant relationship between depression and COVID anxiety. Also, Covid diseases anxiety and avoidance coping strategy predicted depression in pregnant women. Mirzaie et al.[30] study revealed that 57% of participants reported moderate to severe anxiety. Zendehdel et al.[31] reported that progressive muscle relaxation can be used as a useful intervention to reduce anxiety in pregnant women during coronavirus pandemics.

Saadati et al.[25] showed that 73.6% of subjects reported that the COVID-19 pandemic had increased their anxiety; most of them were in the third trimester of pregnancy. 9, 13 and 21% of women had severe health anxiety in the first, second and third trimester of pregnancy, respectively. In Shayganfard et al.[27] research, participants living with or being in contact with a person with COVID-19 had

significantly higher health anxiety. Also, pregnant women who adhered strictly to the hygiene rules and felt worried indicated significantly higher health anxiety. Higher health anxiety predicted the participants to postpone or cancel routine medical health care appointments. Mokaberian and Dehghanpouri study suggests that the participation of husbands in prenatal care education sessions can be an effective and low-cost way to reduce anxiety.[32]

Stress among pregnant women

In three studies, the stress of participants was assessed. In Abedzadeh et al.[24] study 73% of pregnant women experienced high perceived stress. Also, there was a significant relationship between anxiety and perceived stress. Housewives had higher perceived stress compared to employed women. The perceived stress of participants with an appropriate level of physical activity was low. Shayganfard et al.[27] reported that A greater number of children among pregnant women was associated with higher stress. Lower stress predicted which participants postponed/cancelled routine medical care appointments. In Nodoushan et al.[33] study, about 70% of participants had moderate to high stress. Between stress and level of education and employment, a significant difference was observed. Housewives had higher stress compared to employed women. Pregnant women with elementary education had the highest level of stress compared to other levels of education.

Discussion

In the present systematic review, the mental health status (depression, anxiety and stress) of Iranian pregnant women during the COVID-19 pandemic was evaluated. At first, a brief conclusion of each factors presents and then the results are discussed.

Depression. Generally, it could be said that about 40% of pregnant women had symptoms of depression, younger

Table 1: A detailed description of the included studies

Author	Year	Study design	Sample size	Main finding	Quality score
Mokaberian & Dehghanpouri	2021	Experimental	60	after the intervention, women in the experimental group had a significant decrease in anxiety and a significant increase in fetal attachment compared to the control group	20
Abedzadeh Kalhoroodi *et al.*	2021	Cross-sectional	360	The high prevalence of anxiety and stress in pregnant women during the COVID-19 outbreak	20
Karimi *et al.*	2020	Cross-sectional	200	There was a significant negative correlation between COVID-related anxiety and received social support	19
Saadati *et al.*	2021	Cross-sectional	300	9, 13 and 21% of women had severe anxiety in the first, second and third trimesters of pregnancy, respectively. Women in the third trimester had significantly higher health anxiety scores than those in the first trimester	19
Shayganfard *et al.*	2020	Cross-sectional	103	Health anxiety was unrelated to depression or stress. Knowing and being close to infected people was associated with higher health anxiety. Strict following of the safety recommendations was associated with greater health anxiety, depression, and stress.	20
Salehi *et al.*	2020	Cross-sectional	222	the anxiety about COVID-19 and concerns during pregnancy were variables that were positively and significantly correlated with mental health only through one path, which was direct, and anxiety about COVID-19 had also the highest positive direct correlation among them	21
Firouzbakht *et al.*	2022	Cross-sectional	318	About 40% of participants had depression. The most prevalent coping strategy used by pregnant women was the avoidance strategy. Hierarchical regression revealed that the coping strategy of avoidance was a significant predictor of depression	20
Mirzaie *et al.*	2022	Cross-sectional	102	Pregnant women experienced a moderate level of anxiety caused by COVID-19	18
Zendehdel *et al.*	2022	Experimental	126	Progressive muscle relaxation is used as a useful intervention to reduce anxiety in pregnant women during coronavirus pandemics	20
Jafari Nodoushan *et al.*	2020	Descriptive	560	Increasing stress and decreasing the mental health of pregnant women during the COVID-19 pandemic can increase the influencing factors in preterm delivery and unhealthy birth.	21

STROBE score range: 0-22, STROBE: STrengthening the Reporting of OBservational studies in Epidemiology

pregnant women, without a university education and those with high adherence to strict hygiene rules related to COVID-19 had higher depression than others. Also, there was a significant relationship between depression and COVID anxiety. Experiencing a high level of depression caused postponing/cancelling of routine medical care appointments.

Anxiety. The reported prevalence of moderate to severe anxiety (of any kind) among pregnant women ranged between 19 to 74%. There was a significant association between anxiety and depression, stress and mental health. The high educational level of the husband, low physical activity, using protective equipment against COVID-19 infection, low level of social support, the first experience of pregnancy, being in the third trimester of pregnancy, high level of health anxiety, have contact with COVID-19 patients, using avoidance coping strategy, cancelling routine medical care appointments and father's lack of information about prenatal care, all were associated with enhanced anxiety in pregnant women. Additionally, using a progressive relaxation program, decreased the anxiety of pregnant women.

Stress. About 70% of participants reported moderate to a high level of stress. High anxiety, being a housewife compared to being employed, low physical activity, low education, the greater number of children, and cancelling routine medical care appointments were related to experiencing a high level of stress during pregnancy.

Although the prevalence estimation of mental disorders (depression, anxiety, and stress) among Iranian pregnant women during the COVID-19 outbreak was not the aim of this study, the reported prevalence of the above-mentioned symptoms is higher among Iranian pregnant women compared to other pregnant women all around the world. In the present study, the prevalence of moderate to a high level of depression, anxiety and stress symptoms was 40%, 19 to 74%, and 70%, respectively, while in different studies conducted on pregnant women during COVID-19 the prevalence of these symptoms was 30% and 34% for depression and anxiety,[34] 27%, 33%, and 56% for depression, anxiety, and stress.[2] Although the prevalence of adverse psychiatric outcomes was reported higher among the public population during COVID-19 than before the pandemic,[35] it seems that pregnant women in

the current study were more negatively influenced than the general population.

This difference may be due to the small sample and different assessment tools among Iranian pregnant women compared to worldwide studies on this population. Education is an essential element associated with the development of anxiety and depression during pregnancy. Pregnant women without high education have a higher risk to develop depression and anxiety.[36,37] Pregnant women with high education had greater awareness and getting the facts about the COVID-19 pandemic is easier for them compare to low-educated pregnant mothers,[36,38] and can better manage the pandemic situation.[39] Consistent with former findings[40] the present study indicated that housewives had higher stress compared to employed pregnant women. Unemployment during the COVID-19 outbreak enhances staying-at-home duration and decreases social contacts and interpersonal relationships, so the risk of developing depression, anxiety and stress may increase.[41] Physical exercise may have a protective impact on mental health-related disorders development, especially depression and anxiety.[21] Regular physical exercise can change the balance of serotonergic, dopaminergic and noradrenergic systems in the opposite direction as stress, it also enhances self-efficacy and self-esteem and reduces negative thoughts and rumination.[42] A reduced sense of social support is highly related to an enhanced risk of prenatal anxiety and depression development.[43] Social support including the husbands' caring behaviours during pregnancy can enhance the person's general health and the ability to cope effectively with stress so the individual function will be improved.[44] High adherence to hygiene rules and the use of protective equipment against COVID-19 can enhance the stress of pregnant women, and enhancement of stress can increase the vulnerability to depression and anxiety development.[45,46] Consistent with the present findings some studies suggested a high level of fear and anxiety in primiparous women.[47,48] Primiparous women tend to be anxious about a possible unknown pain of pregnancy-related issues and their failure to control it. Anxiety levels appear to be higher in the first and third trimesters of pregnancy.[49,50] Perhaps pregnant women's concerns about the ability to adjust to after childbirth new life increase during the third trimester of pregnancy, especially when there is a pandemic situation like the COVID-19 outbreak. This study had some limitations that need to be addressed in future studies. Mental health is a broad concept that includes many factors, such as depression, anxiety, stress, insomnia, social function, happiness, etc., and the current study only evaluated and investigated some of the most important ones. Additionally, various scales were used to assess anxiety, depression and stress in analyzed papers that can influences the final results. Finally, in some studies, the sample size was approximately small.

Conclusion

Results of the present study indicated a high level of moderate to severe prevalence of depression, anxiety and stress in Iranian pregnant women during the COVID-19 outbreak. There were some protective factors such as physical activity, social support, using progressive relaxation and husbands' involvement in caring behaviours of their pregnant wives that can enhance the mental health of Iranian pregnant women during the COVID-19 pandemic. So, it seems that the mental health status of pregnant women should be regularly evaluated following the current epidemic and necessary education and interventions should be provided for this population to ensure optimal mental health during pregnancy.

Conflicts of interest

Nothing to declare.

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