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RESEARCH ARTICLE

Frequency Distribution of Depression and its Associated Factors among Pregnant Women during the COVID-19 Pandemic

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Abstract:

Aim:

This study aimed to determine the frequency distribution of depression and its associated factors among pregnant women.

Background:

Health is mentioned as a prerequisite for sustainable development in every society, and pregnant women play an irreplaceable role as the central axis of the health of society.

Methods:

A cross-sectional study was conducted with 102 pregnant women living in northeastern Iran, in 2021. The data was collected using an electronic questionnaire that included demographic questions and the Beck Depression Inventory items. Data analysis was done using SPSS-22 statistical software and independent t-tests, one-way analysis of variance, Tukey's post hoc, and linear regression. A significance level of 0.05 was considered.

Results:

The mean depression score of pregnant women was 25.77 ± 6.62, with the majority (53.9%) suffering from moderate depression. The frequency distribution of depression was lower among university-educated women than those with lower-level degrees and among employed women than homemakers (P <0.05). The third trimester of pregnancy was associated with an increased risk of depression (P <0.001). The frequency distribution of depression increased with increasing numbers of children (P <0.001). Miscarriage, a family history of depression, an unwanted pregnancy, and the infliction of close relatives with COVID-19 all increased the risk of depression in women (P <0.05).

Conclusion:

Pregnancy during COVID-19 pandemic can be associated with potential complications for the embryo, mother, and child. Amid the current global COVID-19 Pandemic, all pregnant women must undergo routine screening for depression as part of their prenatal care.

Keywords: Depression, Pregnancy, Women, COVID-19, Disease, Pandemic.

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1. INTRODUCTION

Wuhan, a city in the Hubei province of China, experienced a pneumonia outbreak in December 2019 for which conventional treatments were ineffective. Research findings led to the identification of a new human-transmissible coronavirus subtype [1]. In humans, coronaviruses can cause symptoms ranging from mild cold-like illness to severe and even fatal illness [2]. This virus was designated COVID-19 by the World Health Organization on February 11, 2020, and its pandemic

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was declared a global public health emergency on January 30, 2020 [3].

Since there is currently no cure for this disease, the most effective method of managing it is to prevent new cases from developing through measures such as quarantine and crowd control [4]. Upon the emergence of COVID-19 cases in Iran, all kindergartens, preschools, schools, and universities were closed on February 22, 2020, to prevent further spread and observe social distancing. Moreover, the Ministry of Health issued statements to begin home quarantine until the end of the pandemic [5].

The term "quarantine" describes the practice of isolating and restricting the movement of people at risk of contracting and spreading an infectious disease. Isolation from loved ones, anxiety over contracting a disease, a lack of personal freedom, and a prolonged state of boredom are just a few of the negative aspects of quarantine that can have serious psychological and physiological consequences for those who are forced to endure it [6, 7].

The fear of what might happen as a result of this contagious disease is real for those who have been quarantined. They experience more than just boredom, loneliness, and anger. Rather, in the case of infection, symptoms such as fever, hypoxia, cough, and drug side effects can cause anxiety and mental tension [7].

Long- and short-term studies of the psychological effects of home quarantine for SARS and the coronavirus have both found negative outcomes across all age and gender categories. The most significant short-term effects have been linked to acute stress experience and extreme avoidance of loved ones, while the most significant long-term effects have been associated with anxiety, panic attacks, and depression symptoms [8, 9]. Past review studies have reported significant effects of isolation and quarantine on mental health, including rejection, loneliness, anger, depression, anxiety, low self-esteem, lack of self-control, fear, boredom, emotional problems, disruption of daily activities, and negative effects on coping and psychological functions [6, 10].

Many psychiatric symptoms, such as persistent depression, anxiety, panic attacks, and even self-harm, have been reported by early studies of the COVID-19 outbreak. In fact, people who were quarantined or who believed they were infected with this disease have been found to suffer a higher incidence of depression [11]. On January 26, 2020, the National Health Commission of China announced the basic principles of psychological emergency interventions for COVID-19. The announcement stated that panic, despair, anger, and depression are complications of this pandemic that necessitate significant interventions [12].

All individuals, but especially children, older adults, and pregnant women, must have access to mental and emotional support during this pandemic [13]. Pregnant women are one of the vulnerable populations whose psychological conditions and pandemic-related problems should be prioritized. Pregnancy is a significant physiological event in women's lives and a significant stage of life. This period is a pleasant time for women but may lead to a dire situation. Findings indicate that women are more susceptible to mental disorders such as stress, anxiety, and depression during pregnancy, with depression being one of the most prevalent psychological issues in pregnant women [14].

Depression, as defined by the World Health Organization, is a type of mental health disorder that can cause serious problems in individuals [15]. Important symptoms of depression include sadness, loss of interest, fatigue, and lack of energy [16]. Depression can also be accompanied by sleep disturbances, changes in appetite, concentration difficulties, feelings of guilt, low self-esteem, and suicidal ideation [17].

According to a 2019 estimate by the World Health Organization, approximately 350 million people worldwide suffer from depression [18]. Studies indicate that the prevalence of depression is higher among women (20-25%) than men (7-12%) [19, 20]. Nonetheless, the reason for the disparity in depression rates between the sexes is unclear [21]. Psychiatrists and sociologists believe this may result from the different social roles men and women play [22].

The results of studies indicate that women are typically susceptible to depression during adolescence, before menstruation, during pregnancy, after childbirth, and during menopause [23]. There is evidence that pregnancy and childbirth contribute to the development of postpartum depression in women, with 2004 review study findings indicating 7.4%, 12.8%, and 12% prevalence rates of pregnancy depression in the first, second, and third trimesters, respectively [24]. According to studies, the prevalence of depression during pregnancy ranges between 6 and 25% [25 - 29].

Depression in the mother during pregnancy has been linked to an increased risk of psychological issues, lower academic achievement, and impaired social functioning in the offspring later in life [30]. In addition, according to the World Health Organization, depression during pregnancy can be a risk factor for postpartum depression [30], which may affect between 10 and 15 percent of women for up to a year following childbirth [31]. Inadequate treatment of depression in a pregnant mother may have negative effects on the fetus, including a decrease in birth weight, an increase in the concentration of stress hormones, and complications related to premature birth [32]. Therefore, a timely and accurate diagnosis of depression can lessen its negative effects on the mother and child's health [29].

Women's health is crucial to the nation's long-term prosperity. Health is mentioned as a prerequisite for sustainable development in every society, and women play an irreplaceable role as the central axis of the health of society. During the global COVID-19 pandemic, women face greater emotional and physical strain as they are expected to prioritize the well-being of their families and communities in addition to their own. Given the pandemic's prevalence and the need to raise women's awareness of their essential role in providing family support during the COVID-19 pandemic, it is imperative to examine mental health and address depression in women.

As one of the vulnerable groups during the COVID-19 outbreak, pregnant women are more likely than other people to suffer from depression. To date, however, no study has been

conducted on the effect of COVID-19 on the frequency distribution of depression among pregnant women during the COVID-19 pandemic. Therefore, this study was designed to determine the frequency distribution of depression and its related factors in pregnant women affected by COVID-19 in Khaf.

2. MATERIALS AND METHODS

This is an analytical cross-sectional study that was conducted over the course of three months (from mid-August 2021 to mid-November 2021). One-hundred-two pregnant women referring to comprehensive health service centers in Khaf were selected and recruited by the census.

The data collection procedure entailed the researcher visiting all citywide comprehensive health service centers and describing the research objectives to health care providers (working in the centers).

When pregnant women visited the centers to receive health services, healthcare providers both explained the research objectives and texted them an SMS or WhatsApp message with a link to the questionnaire. Throughout the data collection process, the researcher responded to any questions posed by the pregnant women.

Pregnancy, literacy, access to a smartphone to receive and view the electronic questionnaire link, and informed consent constituted the inclusion criteria. Exclusion criteria included a history of mental illness and the use of drugs related to depression (psychiatrists assessed the diagnostic history of anxiety and depression), chronic diseases, pregnancy complications, and incomplete questionnaire responses.

Healthcare providers were tasked with assisting mothers who were willing to participate in the study but lacked the means to receive and view the electronic questionnaire link.

The informed consent form was the first part of the questionnaire that was required to be completed before proceeding. All participants' informed consent was thus obtained before data collection.

Pregnant mothers were administered an electronic questionnaire to collect data. This electronic questionnaire had two sections. The first section included demographic characteristics such as age, occupation, number of children, trimester of pregnancy, level of education, family income, number of previous pregnancies, history of depression, history of depression in the family, history of abortion, history of unwanted pregnancy, and history of close family members being infected with COVID-19. Beck's Depression Inventory was covered in the second section of the questionnaire. It was employed to measure depression in pregnant women because its items and overall content were congruent with the research objectives.

The Beck Depression Inventory, Second Edition (BDI-II) is a 21-item validated and standardized test used to measure depression. Each of its items has only one answer, which is scored from zero to three, and the total score ranges from 0 to 63. The severity of a person's depression is determined by his or her total score: 0 to 13 for the normal state, 14 to 19 for mild depression, 20 to 28 for moderate depression, and 29 to 63 for severe depression. This questionnaire can reveal the prevalence of the following conditions among individuals: social isolation, indecisiveness, fatigue, loss of appetite, weight loss, physical concerns, sadness, lowered sexual interest, pessimism, a feeling of failure, dissatisfaction, a feeling of guilt, an expectation of punishment, self-hatred, self-blame, suicidal thoughts, crying, shift in attitude toward self-image, sluggishness and slowness, insomnia, and resentment [33].

Multiple studies have confirmed the validity and reliability of this questionnaire. In the study conducted by Fata *et al*., Cronbach's alpha coefficient was 0.91, and the reliability coefficient was 0.94 [34].

The SPSS 22 statistical package was used to analyze the data. Initially, the Kolmogorov-Smirnov test was used to examine the normality of the data's distribution. Due to having a normal distribution, one-way analysis of variance (ANOVA) and Tukey's post hoc test were used to compare the average score of depression according to age, education level, occupation, monthly income, number of children, previous Pregnancy times, and Pregnancy trimester. An independent t-test was used to compare the average depression score according to the history of abortion, family history of depression, history of unwanted pregnancy, and history of COVID-19 among close relatives. Linear regression was used to measure the simultaneous effect of demographic characteristics on depression. A significance level of 0.05 was considered.

3. RESULTS

This study evaluated 102 pregnant women from the city of Khaf. Table **1** outlines the demographic characteristics of the study subjects. The frequency distribution of depression is highest among pregnant women under 30 years (n=42, 41.2%), those with a university education (n=40, 39.2%), homemakers (n=39, 38.2%), and those with a monthly income of 5-10 million tomans (n=43, 42.2%). The majority (n=41, 40.2%) were in their second trimester of pregnancy and had two children (n=41, 40.2%). Twenty-four individuals (23.5%) had a

Table 1. Demographic characteristics of the studied pregnant women.

Variable		Frequency	Percent
Age (year)	≤ 30	42	41.2
	31-35	34	33.3
	> 35	26	25.5
Education	Primary/Secondary	22	21.6
	High school	40	39.2
	Tertiary	40	39.2

(Table 1) contd.....

Variable		Frequency	Percent
Occupation	Health worker	16	15.7
	Non-health care worker	30	29.4
	Homemaker	39	38.2
	Self-employed	17	16.7
Monthly income (million tomans)	≤ 5	39	38.2
	5-10	43	42.2
	> 10	20	19.6
Pregnancy trimester	1	37	36.3
	2	41	40.2
	3	24	23.5
Number of children	0	14	13.7
	1	37	36.3
	2	41	40.2
	3 or more	10	9.8
Pregnancy times	None	8	7.8
	1	36	35.3
	2	42	41.2
	3 or more	16	15.7
History of abortion	No	78	76.5
	Yes	24	23.5
Family history of depression	No	96	94.1
	Yes	6	5.9
Pregnant women	without depression	2	2
	With depression (mild, moderate, severe)	100	98
Unwanted pregnancy	No	92	90.2
	Yes	10	9.8
History of COVID-19 among close relatives	No	85	83.3
	Yes	17	16.7

Table 2. Frequency distribution of depression in the studied pregnant women.

Depression Level	Frequency	Percent
None	2	2
Mild	14	13.7
Moderate	55	53.9
Severe	31	30.4

history of abortion, six individuals (5.7%) had a history of depression in their family, and ten individuals (9.8%) had an unwanted pregnancy. Moreover, 17 women (16.7%) reported that close relatives had been diagnosed with COVID-19 (Table **1**).

The mean depression score for pregnant women was 25.77 ± 6.62, and the results indicated that the majority of the women (53.9%) had a moderate degree of depression (Table **2**).

According to Table **3**, the frequency distribution of depression among women has shown a significant increase with age (P <0.001). It was found that college-educated women had a significantly lower frequency distribution compared to women with primary/secondary degrees, and non-healthcare workers had a lower frequency distribution compared to healthcare workers and homemakers (P <0.05). Additionally, there was a significant decrease in the frequency distribution of depression as monthly income increased (P=0.005). The study also revealed that the frequency distribution of depression was

Table 3. Comparison of the mean scores of depression in pregnant women according to demographic characteristics.

Variable		Depression	P-value
		Mean ± SD	
Age (year)	≤ 30	22.31 ± 5.47	<0.001
	31-35	27.38 ± 4.13	
	> 35	29.27 ± 8.30	
Education	Primary/Secondary	28.32 ± 4.91	0.02
	High school	26.48 ± 6.68	
	Tertiary	23.68 ± 6.87	

(Table 3) contd.....

Variable		Depression	P-value
		Mean ± SD	
Occupation	Health worker Non-health care worker Homemaker Self-employed	28.50 ± 7.84 23.37 ± 6.01 27.33 ± 5.44 23.88 ± 7.42	0.02
Monthly income (million tomans)	≤ 5 5-10 > 10	28.33 ± 7.01 24.70 ± 4.84 23.10 ± 7.70	0.005
Pregnancy trimester	1 2 3	22.73 ± 6.33 25.41 ± 3.72 31.08 ± 7.81	<0.001
Number of children	0 1 2 3 or more	21.64 ± 4.57 23.14 ± 6.42 27.83 ± 4.15 32.90 ± 9.43	<0.001
Pregnancy times	None 1 2 3 or more	19.75 ± 5.26 22.58 ± 4.78 27.24 ± 5.35 32.13 ± 7.58	<0.001
History of abortion	No Yes	24.94 ± 6.63 28.50 ± 5.92	0.02
Family history of depression	No Yes	25.35 ± 6.42 32.50 ± 6.53	0.01
Unwanted pregnancy	No Yes	25.30 ± 6.38 30.10 ± 7.52	0.03
History of COVID-19 among close relatives	No Yes	25.07 ± 6.43 29.29 ± 6.58	0.02

significantly higher in third-trimester pregnant women compared to those in the first and second trimesters (P <0.001). Furthermore, an increase in the number of children and previous pregnancies was associated with a significant increase in the frequency distribution of depression (P <0.001), with the highest frequency distribution observed in women who had three or more children. Moreover, the results indicated that women with a history of abortion, a family history of depression, unwanted pregnancy, and close relatives with a history of coronavirus infection had a significantly higher frequency distribution of depression (P <0.05) (Table **3**).

Multiple linear regression was used to investigate the effect of demographic variables on the depression of pregnant women. The variables of the number of children and the number of previous pregnancies were quantitatively and the variables of age, education level, occupation, monthly income level, trimester of pregnancy, history of abortion, family history of depression, unwanted pregnancy, and history of COVID-19 among close relatives were entered into the equation qualitatively.

Duming Coding was used to enter qualitative variables into the model. The results of the mentioned test showed that the level of depression in women aged 31-35 years and more than 35 years is significantly higher than in women aged 30 years and less (p<0.05). The frequency distribution of depression in pregnant women in the third trimester was significantly higher than in pregnant women in the first trimester (p=0.02).

A negative and significant relationship was found between depression with the level of university education and the level of the monthly income of more than 10 million Tomans, and a positive and significant relationship was found between depression and the history of abortion (p<0.05). However, there was no significant relationship between the variables of occupation, number of children, number of previous pregnancies, family history of depression, unwanted pregnancy, and the history of COVID-19 among close relatives with depression (p>0.05) (Table **4**).

4. DISCUSSION

Pregnancy is a physiological phenomenon and one of the most significant processes in a woman's life. Even though this is a special time with pleasant feelings for women, it can turn into a dire situation. Women are more susceptible to mental disorders such as stress, anxiety, and depression during pregnancy. Pregnant women undergo numerous physiological, psychological, and social changes, making depression one of the most prevalent mental disorders in this population [14].

This depression can have numerous adverse effects on the mother and child (during the fetal stage, neonatal period, *etc*.). Numerous psychiatric symptoms, including persistent depression, anxiety, panic attacks, and even self-harm, have been reported in various population groups, including pregnant women, during the early stages of the COVID-19 outbreak [35]. This study aimed to determine the frequency distribution of depression and its related factors in pregnant women during the COVID-19 pandemic because of the significance of their mental health during this period.

Table 4. Regression coefficients related to the effect of demographic variables on pregnant women's depression.

Variable		Non-standard Coefficient		Standard Coefficient	T value	Significance Level	Correlation Coefficient	Coefficient of Determination
		B value	Standard Error	β value				
Constant		17.82	2.43	-	7.32	<0.001	0.75	0.47
Age (year)	31-35 years	3.58	1.41	0.26	2.53	0.01		
	> 35 years	4.42	1.66	0.29	2.66	0.009		
Education level	Tertiary	- 1.84	1.71	- 0.12	1.08	0.28		
	High school	- 2.80	1.44	- 0.21	1.96	0.05		
Occupation	Health worker	3.05	2.07	0.17	1.48	0.14		
	Non-health care worker	2.29	1.93	0.16	1.19	0.24		
	Self-employed	1.65	1.83	0.09	0.90	0.37		
Monthly income (million tomans)	5-10	- 1.17	1.54	- 0.09	0.76	0.45		
	> 10	- 4.39	2.06	- 0.27	2.13	0.04		
Pregnancy trimester	Second trimester	1.16	1.29	0.09	0.90	0.37		
	Third trimester	3.76	1.60	0.24	2.35	0.02		
Number of children		1.86	1.86	0.24	0.99	0.32		
Pregnancy times		0.36	1.91	0.05	0.19	0.85		
History of abortion		3.17	1.63	0.20	1.96	0.05		
Family history of depression		1.01	3.98	0.04	0.26	0.80		
Unwanted pregnancy		0.63	2.73	0.03	0.23	0.82		
History of COVID-19 among close relatives		1.76	2.07	0.09	0.81	0.42		

The majority of studies on COVID-19 in pregnancy have focused on the physical effects of the pandemic on infected mothers and the potential for vertical transmission. As an innovation, we examine the frequency distribution of depression and its associated factors among pregnant women. Notably, the related literature has examined the frequency distribution of depression in general terms, *i.e.*, the proportion of depressed women in the study population and at a time other than the COVID-19 pandemic. In this investigation, we examined the frequency distribution among pregnant women in greater depth during the COVID-19 pandemic.

Taking into account the normative threshold of the Beck questionnaire, the current study found that most of the women in the sample had a moderate degree of depression. In line with the present study's findings, Omidvar *et al*. (2016) found that the relative frequency of depression in pregnant women was moderate in their study. Studies conducted worldwide have yielded varying results. In the United States, the prevalence of depression among pregnant women in 2005 was 27% [36], while in Japan, it was approximately 19% in 2013 [37]. The prevalence among pregnant women varies greatly between countries and even cities within the same country. The use of different tools to measure depression, different reporting methods, and different cultures and lifestyles in different countries and cities within the same country may all contribute to the varying reports of depression levels among pregnant women.

Depressive disorders during pregnancy can be a precursor to future difficulties for pregnant women. Depression during this time not only causes mental and psychological issues for the pregnant woman but can also have adverse effects on the fetus. The level of prenatal depression, on the other hand, can well predict the course of postpartum depression. Women with higher levels of depression during pregnancy are more likely to experience postpartum depression [15]. The rapid spread of COVID-19 altered social dynamics and had immediate consequences, including increased isolation and a diminished desire for interpersonal contact. These conditions caused numerous mental and emotional harms, including the onset or worsening of depressive symptoms in individuals.

Meanwhile, many risks have been linked to pregnant mothers' physical and mental health, making them one of the most vulnerable populations. Concerns about the health of themselves, their families, and their unborn children, as well as forced behavioral changes such as social isolation and communication limitations due to the global COVID-19 pandemic, have caused or exacerbated depressive symptoms in pregnant women [38, 39].

According to the findings of this study, the frequency distribution of depression among pregnant women increases with age. So that the level of depression in women aged 31-35 years and more than 35 years old was significantly higher than women aged 30 years and less. In line with our findings, Bennett *et al*. found that the prevalence of depression in pregnant women increases by approximately 0.014 for every one-unit increase in their mean age [40]. This finding is inconsistent with those of Chen *et al*. (41), primarily attributable to the COVID-19 circumstances and the strong correlation between increasing age and COVID-19 infection and COVID-19 symptom severity. Pregnant women are particularly vulnerable to contracting the COVID-19 disease, and a woman's advanced maternal age can serve as both a risk factor for having a high-risk pregnancy and an increased risk of contracting the disease. Therefore, the higher depression rate

among older pregnant women may result from their greater awareness of the association between gestational age and COVID-19 contraction as a risk factor (as notified through the media and training received during prenatal care).

According to the findings of this study, the frequency distribution of depression is lower among women with a university education than those with primary/secondary education. In the interpretation of this research finding, it can be noted that people with a higher level of education have a better understanding of the COVID-19 disease and the ways to prevent it; as a result, increased education can ultimately lead to improved health literacy and self-care among pregnant women and a lower frequency distribution of depression among them. In this regard, the findings of Robinson's study indicate that women with lower education levels have lower levels of awareness, causing higher anxiety and stress levels and facilitating the development of other mental disorders [41].

According to our findings, the frequency distribution of depression among non-healthcare workers was significantly lower than that of women in the healthcare sector and homemakers. These findings are consistent with those of a previous study by Rubertsson *et al*. on Swedish pregnant women, which found that a lack of paid employment outside the home increased the risk of depression for the women in the study [42]. Also, the findings of Zareipour *et al*. are consistent with this finding, as they found that homemakers are more likely to experience depression [43]. Results from the study by Pazandeh *et al*. do not corroborate with those from the current study, as they found no correlation between maternal employment and postpartum depression [44]. We can attribute this discrepancy in results to the different environmental conditions between studies (the COVID-19 pandemic), as well as home quarantines and mandatory restrictions. During the COVID-19 pandemic, people have suffered mental and emotional harm as a result of mandatory quarantine and communication restrictions. As a result, pregnant women who are homemakers and non-workers may be particularly vulnerable to the unique challenges posed by the COVID-19 pandemic, which may help explain why they are more likely to experience depression. In the meantime, the findings of this study indicate that the frequency distribution of depression among pregnant women working in health care centers is higher than that of non-healthcare workers. Pregnant women working in healthcare centers during the COVID-19 pandemic face increased work pressure, forced overtime, caring for COVID-19 patients, and the fear of contracting COVID-19 while providing patient care. Pregnant women who work in healthcare settings may be more likely to experience depression due to the aforementioned circumstances.

According to our findings, the frequency distribution of depression decreases significantly as family income rises. The availability of masks, disinfectants, and other personal protective equipment for self-care against COVID-19, as well as regular access to high-quality medical care, in-home medical services, and improved nutrition, may all have contributed to a decrease in depression among this group of expectant mothers.

The frequency distribution of depression among pregnant women in the third trimester was significantly higher than in the first and second trimesters, according to the present study's findings. Bennett *et al*. [40] and Laloui *et al*. [45] found that the prevalence of depression is greater in the second trimester of pregnancy, which contradicts the current study's findings. Different environmental conditions of the studies can be cited as a possible explanation for the discrepancy in findings; our study was conducted during a coronavirus pandemic, while other studies did not. In the last three months of pregnancy, mothers experience significant physiological changes in their physical condition and become more concerned about their health; they may mistake natural symptoms for coronavirus symptoms, putting their child's health at risk. Consequently, all these factors can increase the prevalence of depression among pregnant women during the third trimester.

According to our findings, the frequency distribution of depression has increased significantly along with the number of children and previous pregnancies, with the highest frequency distribution of depression being associated with women who have had three or more children. Numerous studies support the present study's finding that mothers with a greater number of children and pregnancies are more susceptible to depression. These findings can be interpreted as showing that the risk of complications during pregnancy is higher for mothers carrying multiple children as their role and living conditions become more taxing. Therefore, while the mother accepts more responsibility in caring for her children under the conditions of the COVID-19 pandemic, re-pregnancy can place a greater care burden on her and increase the prevalence of depression among pregnant women.

The present study revealed that the frequency distribution of depression was significantly higher among women with a history of abortion. The findings of Laloui *et al*. [45] and Barbara *et al*. [46] are consistent with those of the present study, as they also found a correlation between abortion history and the prevalence of depression.

This study found that the frequency distribution of depression was significantly higher among women with a family history of depression. Bernazzani *et al*. researches demonstrated that a family history of depression could directly affect depression during pregnancy, which is consistent with our findings [47]. Lalooei *et al*. [45] did not, however, discover a correlation between a family history of depression and depression during pregnancy.

Our study revealed that the frequency distribution of depression was significantly higher among women with a history of unwanted pregnancies. In this regard, Hosseini *et al*. [48] found a significant correlation between unintended pregnancy and pregnancy depression. Lalooei *et al*. [45] did not find a correlation between unwanted pregnancy and depression during pregnancy.

The findings of this study revealed that the frequency distribution of depression was significantly higher among women with a family history of COVID-19. Similar studies have confirmed the psychological effects of COVID-19 infection among close family members on pregnant mothers, which may contribute to the frequency distribution of depression in pregnant women. In this regard, Abedzadeh *et al*.

[49] found that pregnant women with COVID-19-infected family members had higher anxiety scores. Likewise, Fakari *et al*. [50] found that pregnant mothers require more emotional support, adding that family members' infection with COVID-19 may reduce their communication with each other and with other relatives, resulting in increased stress and anxiety in pregnant women and the development of depression in pregnant women.

CONCLUSION AND RECOMMENDATIONS

The global COVID-19 pandemic has caused unprecedented stress and anxiety among pregnant women [49]. The high levels of anxiety and stress caused by the COVID-19 pandemic, forced restrictions in interpersonal and social relationships, the uncertain status of the disease in the present and future, home quarantines, and concerns about the health status of themselves and the fetus in pregnant mothers all contribute to the development of depression. Despite the high risk of depression in pregnant women, many physicians neglect to evaluate, diagnose, and treat it appropriately. One of the most important reasons for this disregard is that the physical symptoms of depression during pregnancy, such as changes in sleep and appetite, can be confused with physiological changes related to pregnancy, and depression can be difficult to diagnose. In addition, the unique circumstances of the COVID-19 pandemic cause pregnant women with a confirmed or likely diagnosis of depression to visit healthcare centers less frequently or to discontinue treatment.

In light of the frequency distribution of depression in pregnancy during the COVID-19 pandemic, the debilitating effects of depression in pregnant women can cause problems for the fetus, mother, and child, as well as increase the risk of postpartum depression. Routine care during pregnancy should include screening for depression, and questions about the signs and symptoms of depression in pregnant women should be asked under all circumstances especially during the COVID-19 pandemic.

Improving the quality of care given to women suffering from depression during the COVID-19 pandemic appears crucial. Likewise crucial is raising the awareness of physicians and other healthcare personnel about depressive symptoms in pregnant mothers during the pandemic and developing an effective communication system between pregnancy care and psychological care to diagnose depression symptoms.

This study clarified the correlation between the COVID-19 pandemic and the onset of depression in pregnant women. Based on the findings of the current research, pregnant women should receive psychological support in times of COVID-19. Inadequate planning to recognize and treat depression in pregnant women affected by the COVID-19 pandemic can result in pregnancy-related complications that affect both mother and child. In light of the global COVID-19 pandemic, it is recommended that screening for depression in pregnant women be considered part of routine care during pregnancy.

LIMITATIONS OF THE STUDY

Similar to other research, the current study has limitations. Given the current state of affairs surrounding COVID-19, its primary limitation is the lack of resources and research on the mental health consequences of the pandemic (particularly depression) caused by COVID-19 worldwide and in Iran. It is important to remember that this study was only conducted in Khaf and that cultural and geographical factors play a role in the frequency distribution of depression in pregnant women in different parts and provinces of the country. Therefore, caution is warranted when generalizing the results. By conducting similar studies in other locations, it will be possible to evaluate the relative significance of cultural and social differences. In addition, this research was conducted at the beginning of the fifth wave of COVID-19 in Iran, when people were recommended to stay home. Due to the cross-sectional design of the current study, it was not possible to measure whether or not people's psychological responses change as the conditions persist. It is recommended that future researchers pay close attention to this point. Among the other limitations of this study is the fact that the research and data collection were conducted primarily through an electronic questionnaire and in absentia. Other limitations of the current study included the short duration of the study, the use of self-reporting, the small sample size, and the physical and mental health of pregnant women during the study period. Future research on the frequency distribution of depression and its related factors in pregnant women should be conducted over a longer time frame and with a larger sample size.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This article reports the results of a research project approved by Mashhad University of Medical Sciences with the code of ethics (IR.MUMS.REC.1400.104).

HUMAN AND ANIMAL RIGHTS

No animals were used for studies that are the basis of this research. All human procedures followed were per the guidelines of the Helsinki Declaration of 1975.

CONSENT FOR PUBLICATION

In order to comply with ethical considerations in this research, the information of the participants was kept confidential and other people were not able to access this information. The names and surnames of the participants were not used for data collection, and data collection was done after obtaining the code of ethics from Mashhad University of Medical Sciences.

STANDARDS OF REPORTING

STROBE guideline has been followed.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author [R.R] upon reasonable request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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