Relationship of fear of COVID-19 and pregnancy-related quality of life during the COVID-19 pandemic

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ARTICLE INFO	ABSTRACT
	Aim: The aim of this study was to determine the relationship between fear of COVID-19 and quality of life in Iranian pregnant women during the COVID-19 pandemic. *Methods:* This cross-sectional study was carried out on 250 Iranian pregnant women. Data was collected through questionnaires including demographic and obstetric characteristics, fear of COVID-19 and quality of life. An adjusted general linear model was used to determine the relationship between variables. *Results:* There was a negatively significant relationship between fear of COVID-19 and quality of life ($P < 0.001$). Based on the adjusted general linear model, it was expected that if COVID-19 fear score increased, the quality of life score would decrease significantly (B = -0.21, 95%CI: −0.34 to −0.09, $P = 0.001$). *Conclusion:* This study indicated a reverse correlation between fears of COVID-19 and quality of life. Therefore, developing appropriate interventions in order to overcome the fear caused by COVID-19 are recommended to improve pregnant women's quality of life.

Introduction

The present is a horrible time, where many cities and countries are suffering from COVID-19 pandemic (Amin, 2020). The COVID-19 pandemic appeared firstly on December 12, 2019 in Wuhan, Hubei Province, China (Hui et al., 2020). Due to wide spread of COVID-19, World Health Organization (WHO) has recognized it as a pandemic (Satici et al., 2020). The recent COVID-19 pandemic situation is very serious and stressful around the world (Wang et al., 2020). The prevalence of COVID-19 and its epidemic nature has resulted widespread concern, fear and anxiety (Ahorsu, Imani, et al., 2020; Ahorsu, Lin, et al., 2020). Therefore, one of the psychological aspects of COVID-19 pandemic is fear (; Pakpour & Griffiths, 2020) and understanding the effect of such aspect on the individuals' mental health is very important (Xiang et al., 2020).

Fear and horror resulted from COVID-19 may lead to defamation and social exclusion experience in the positively diagnosed and treated patients as well as their family and all other people in contact with it. Furthermore, it can increase the risk of mental health problems such as adjustment disorder and depression (Amin, 2020; Zhang et al., 2020). Fear is a defensive mechanism of the creatures with adaptability power which is essential for survival. However, while being chronic or disappropriate, it will be harmful and may be considered as a key component to result a variety of mental disorders (Garcia, 2017; Shin & Liberzon, 2010). For as much as the countries of the world have to work to reduce the transmission of COVID-19 and achieve a comprehensive goal, i.e. having a society free of COVID-19, they should work on individual fears of people (Ahorsu, Imani, et al., 2020; Ahorsu, Lin, et al., 2020). Among the groups of people vulnerable to viral infections and the related consequences, we may suggest to pregnant women (Rasmussen et al., 2020).

Pregnant women are considered as a unique vulnerable group in any prevalence of infectious disease, due to physiological changes, increased susceptibility to infections as well as mechanical and safety dysfunctions (Dashraath et al., 2020). Physiological changes during pregnancy including decreased Functional Residual Capacity (FRC), elevated diaphragm and changes in cellular immunity lead to increased susceptibility to viral infections and consequently more crucial results (Alzamora et al., 2020; Dashraath et al., 2020). Conditions including severe stress, emergencies, conflicts and natural disasters may increase the risks of mental illness during pregnancy period. Hence, it is acceptable that pregnant women are vulnerable to mental and

psychological health problems during COVID-19 epidemic (Thapa et al., 2020). Pregnant mothers' concerns and fears about their health and infants due to prevalence of such disease are increasing (Mirzadeh & Khedmat, 2020). On the other hand, as it brings about considerable changes in the mental and psychological health status, it will also cause to reduce social performance, vitality and life quality of pregnant women (Nik-Azin et al., 2013; Papastathi et al., 2016).

As defined by WHO, the quality of life includes the people's understanding of their situation in life in terms of the culture, the value system of the country where they are living as well as their goals, expectations, standards, and priorities which are quiet individual and cannot be observed by others. It is based on the people's understanding of different aspects of their life (World Health Organization, 2013). Ahorsu et al. demonstrated in their investigation that there is a negatively significant relationship between pregnant women's fear of COVID-19 with their mental quality of life; the more their fear, the less their mental quality of life (Ahorsu, Imani, et al., 2020; Ahorsu, Lin, et al., 2020).

The present study was conducted aiming to determine the relationship between fear of COVID-19 and pregnancy-related quality of life during prevalence of COVID-19 in Tabriz-Iran, for which we considered the conditions of disasters, crisis and diseases such a COVID-19 followed by a quarantine as well as increasing level of fear, stress and mental damages in the people of society. Also, we noted that such fear in pregnant women is an addition threat to physical, mental and psychological health of mothers and their fetus and finally for the society's health and took into account the lack of efficient studies on the quality of life during pregnancy and the related effective factors within this pandemic.

Methods

Type of study and participants

This is a descriptive-analytical cross-sectional study carried out within prevalence of COVID-19 period from June to August 2020, on pregnant women attended in the obstetrics clinic of 29-Bahman Hospital in Tabriz-Iran.

The study inclusion criteria was determined as the individuals who desire to participate, having Iranian nationality, living in Tabriz, having literacy for reading and writing, being women with 12-week or longer pregnancy, having single pregnancy, having no disease / disorder or medical, obstetric and underlying risk factors as well as the lack of stressful accidents during the last 6 months, such as the death of a loved one and divorce. The exclusion criteria was considered as the failure to fill the questionnaire completely, death of the fetus, major anomalies in the fetus, massive bleeding, Fetal growth disorders such as Intrauterine growth restriction (IUGR), macrosomia, having blood pressure of 140/90 mmHG or higher at the time of attending in clinic, any medical and obstetric disorder in mother (hypertension induced in the pregnancy, hypertension before pregnancy, overt diabetes, gestational diabetes, ….).

The sample size was determined by using the G-power software. According to the results of a study performed by Alyami et al. (2021) on the fear of COVID-19 and with considering standard deviation (SD) = 5.67, d (percision) = 0.07 around the mean (m = 16.73), effect size d = 0.21, α = 0.05, and power = 95%, the sample size was calculated 248 persons; in this study 250 participants were investigated.

Sampling

After obtaining the ethics committee's permission (code: IR, TBZMED.REC.1399.332 in 29/6/2020), this study was conducted in a social security affiliated hospital. The sampling was performed by the Convenience Sampling method by which the researcher attended the obstetrics clinic of the hospital and all women with over 12 months pregnancy and meeting the inclusion criteria, entered into the study.

Before starting the study, women were given necessary explanations about the goals and methodology of the study, voluntary participation, privacy, confidentiality and the right to cancel the participation in all stages of data collection. They were assured that their information would be kept confidential with the researcher, and an informed written consent was obtained from the participants. The questionnaires were checked by the investigator as soon as they were filled. In case any sample did not understand the questions, they would be explained by the researcher.

Data collection tools

The instrument for data collection was a three-part questionnaire including demographic and obstetric characteristics, fear of COVID-19 and pregnant women's quality of life (QOL-GRAV).

The demographic and obstetric characteristics questionnaire consists of age, education, job of pregnant woman and her husband, duration of marriage, residence area, economic situation, pregnancy rate, number of children born alive, gestational age, the effect of COVID-19 on receiving prenatal cares, infection with COVID-19, infection of relatives or family with COVID-19, increased length of time the husband stays at home, decreased income of the husband and worse behavior of the husband during prevalence of COVID-19 pandemic, the effect of this disease on the relationship with the husband and finally checking the self-expressed health status.

Fear of COVID-19 questionnaire was formulated for the first time by Ahorsu, Imani, et al. (2020) and Ahorsu, Lin, et al. (2020) and by these people tested for psychometrics in Iran (Ahorsu, Imani, et al., 2020; Ahorsu, Lin, et al., 2020). This questionnaire consists of 7 questions stated using 5-point Likert scale in which the answers are "strongly disagree", "disagree", "neither agree nor disagree", "agree" and "strongly agree". The minimum score and the maximum one for each question is 1 and 5, respectively. By summing the scores of each question, we could calculate the total score. The range of scores to be achieved is 7 to 35. The higher score shows greater fear of COVID-19. The Cronbach's alpha coefficient in this study was obtained as 0.91.

Pregnant women's quality of life questionnaire (QOL-GRAV) was designed by Vachkova et al. (2013) in 2013, using WHO Quality of Life-BREF questionnaire (WHOQOL-BREF). It consists of nine questions for expressing the amount of individual's experience of life quality during her pregnancy. Scoring for each item was done according to Likert scale from never (zero) to completely (four). Total score of pregnancy-related quality of life (QOL-GRAV) was between 0 and 4, and the higher score indicates a higher quality of life. In this questionnaire, the first 6 questions were scored reversely. The reliability and validity of this questionnaire were tested in Iran by Mirghafourvand et al. (2016) and Cronbach's alpha coefficient was reported as 0.7 (Mirghafourvand et al., 2016). The Cronbach's alpha coefficient was calculated as 0.85 in this study.

Statistical analysis

The collected data were analyzed by SPSS statistical software version 21. Examining the normality of quantitative data using Skewness and Kurtosis, we found all having normal distributions. To describe the fear of COVID-19 and pregnancy-related quality of life, a descriptive statistics including the mean and standard deviation (SD) were used. In bivariate analysis, the Pearson correlation test was applied to demonstrate the relationship between fear of COVID-19 and pregnancy-related quality of life. In multivariate analysis, the general linear model was used with adjusting the socio-demographic and obstetrics variables. For this, firstly, the relationship of each demographic and obstetric characteristics with the quality of life total score was measured through independent *t*-test and one-way ANOVA and then, the variables with $p <$ 0.05 related to quality of life total score as well as fear variable were included in the adjusted general linear model.

Results

No data lost during the data collection process. The mean (SD) of pregnant women's age was 30.57 (5.87) years old. More than half of the participants (%53.2) had high school education. Most of the women (% 94.4) were housewives. The mean (SD) age of the husbands was 35.39 (5.76). Less than half of the participants' husbands (%42.8) had high school education. Five persons (%2) of the research units had an experience of infection with COVID-19 and a report was received about the infection of 21 (%8.4) persons including family members or relatives with this disease. Approximately one-third of women (%30.4) considered the prevalence of COVID-19 pandemic as an effective factor in reducing the prenatal cares they should receive. The mean (SD) of marriage duration was 8.74 (5.09) years. Also, most of the participants (%91.2) lived in the city. A majority of them (%78.4) evaluated the economic situation of their family as average (Table 1).

The mean (SD) fear of COVID-19 was 22.29 (7.08) out of the achievable score range of 7 to 35. The mean (SD) pregnancy-related quality of life in this study was 2.77 (1.04) out of achievable score range of 0 to 4. According to Pearson correlation test, there was a negatively significant statistical correlation between fear of COVID-19 and pregnancy-related quality of life ($r = -0.296$, $P < 0.001$). Examining the relationship between socio-demographic and obstetrics characteristics of mothers and their pregnancy-related quality of life, showed a statistically significant relationship between the husband's job ($p = 0.012$), husband's age ($p = 0.020$), the household economic status ($p = 0.023$), self-expressed health ($p = 0.002$), decreased prenatal cares due to COVID-19 prevalence ($p = 0.016$), increased length of time the husband stays at home ($p = 0.039$), reduced income of the husband during COVID-19 prevalence ($p = 0.048$), aggressive behavior of the husband during this pandemic ($p = 0.002$) and the bad effect of this disease on

the relationship of the wives with their husbands ($p < 0.001$). These variables plus fear of childbirth were included in the general linear model; the results suggested that controlling the demographic and obstetrics characteristics as possible confounding variables, while fear of COVID-19 increased, the quality of life score decreased significantly (B = -0.21, 95%CI: -0.34 to -0.09, $P = 0.001$) (Table 2).

Discussion

In this study, the participants had average fear and quality of life. The mean (SD) fear of COVID-19 in our study was 22.29 (7.08). In an investigation carried out by Reznik et al. (2020) in the general population of Russia, the mean fear of COVID-19 was obtained as 17.2 which was less than what we calculated in our investigation. The reason might be the differences of population under study, since pregnant women report greater fear and concerns about the bad consequences resulted by COVID-19 to their pregnancy and fetus, due to their particular circumstances. For the unexpected prevalence of COVID-19 and the people's lack of access to sufficient information about such disease, one of the concerns in pregnant women is fear of fetal infection and mother-to-child vertical transmission (Alijanpour et al., 2020). Davis-Floyd et al. (2020) reported in their study in USA that pregnant women showed their concern and fear for the possibility transmission of COVID-19 in hospitals while receiving prenatal cares. In another investigation conducted by Biviá-Roig et al. (2020), %22.5 of pregnant women had cancelled their medical visits due to fear of COVID-19 transmission, and approximately %52 of those women could not attend childbirth readiness classes due to such fear. Since during prevalence of COVID-19, hospitals and health centers were considered as an infectious place, and this issue may reduce the cares received during prevalence of such epidemic diseases (Davis-Floyd et al., 2020).

Table 1
Socio-demographic and obstetrics characteristics of the participants and their relationships with quality of life around COVID-19 disease.

Characteristic	Number (Percent)	Mean (SD)	P-value	Characteristic	Number (Percent)	Mean (SD)	P-value
Age (Year)				Duration of marriage (Year)			
15–25	53 (21.2)	2.6 (1.2)		≤5	75 (30)	2.6 (1.1)	
26–35	142 (56.8)	2.8 (0.9)	0.371*	6–10	92 (36.8)	2.9 (1.0)	0.682*
36–45	55 (22)	2.7 (1.1)		≥10	83 (33.2)	2.7 (1.0)	
Education				Pregnancy number			
Illiterate	1 (0.4)	3 (0)		1	69 (27.6)	2.7 (1.2)	
Elementary	16 (6.4)	3.2 (1.2)		2	97 (38.8)	2.8 (1.0)	0.360*
Secondary	58 (23.2)	2.8 (1.0)	0.762*	≥3	83 (33.6)	2.7 (1.0)	
High school diploma	133 (53.2)	2.8 (1.0)		Alive children			
University	42 (16.8)	2.5 (1.2)		0	78 (31.2)	2.7 (1.1)	
Job				1	117 (46.8)	2.8 (1.0)	0.145*
Housewife	236 (94.4)	2.8 (1.1)		2	51 (20.7)	2.9 (1.0)	
Working at home	9 (3.6)	3 (0.7)	0.986*	≥3	4 (1.6)	1.7 (1.2)	
Working outside the home	5 (2)	2.6 (0.5)		Self-rated health status			
Husband's age				Very good	36 (14.4)	3.2 (0.9)	
20-30	54 (21.6)	2.5 (1.1)		Good	108 (43.2)	3.0 (0.9)	0.002*
31–40	148 (59.2)	2.9 (0.9)	0.020*	Neither good nor poor	92 (36.8)	2.5 (1.0)	
≥40	48 (19.2)	2.5 (1.2)		Poor	12 (4.8)	1.7 (1.0)	
Husband's education				Very poor	2 (0.8)	1.5 (0.7)	
Illiterate	7 (2.8)	2 (0.8)		The effect of COVID-19 disease on receiving the pregnancy care			
Elementary	34 (13.6)	2.9 (0.8)		Yes	76 (30.4)	2.5 (1.1)	0.016**
Secondary	62 (24.8)	2.9 (0.9)	0.640*	No	174 (69.6)	2.9 (1.0)	
High school diploma	107 (42.8)	2.8 (1.1)		Prolonged spouse's stay at home during the COVID-19 outbreak			
University	40 (16)	2.6 (1.2)		Yes	151 (60.4)	2.7 (1.1)	0.039**
Husband's job				No	99 (39.6)	2.9 (0.9)	
Unemployed	6 (2.4)	2.2 (1.0)		Reduction of the spouse income during the COVID-19 outbreak			
Laborer	104 (41.6)	3.0 (1.0)	0.012*	Yes	193 (77.2)	2.7 (1.1)	0.048**
Employee	18 (7.2)	2.8 (1.2)		No	57 (22.8)	3.0 (0.9)	
Freelance	122 (48.8)	2.6 (1.0)		Aggressive behavior of the spouse during COVID-19 outbreak			
Household economic status				Yes	39 (15.6)	2.3 (1.1)	0.002**
Very poor	5 (2)	1.6 (1.0)		No	211 (84.4)	2.8 (1.0)	
Poor	48 (19.2)	2.5 (1.1)	0.023*	The effect of COVID-19 disease on the relationship with the spouse			
Moderate	196 (78.4)	2.9 (1.0)		Yes	54 (21.2)	2.3 (1.1)	0.001**
Rich	1 (0.4)	3 (0)		No	196 (78.4)	2.9 (1.0)	

* One-way ANOVA.
** Independent t-test.

Table 2

The relationship between fear of COVID-19 and quality of life in pregnant women during the outbreak of Covid 19 in Iran based on the general linear model.

Variable	Adjusted	
	β (CI95%)	P-value
Fear of COVID-19	−0.21 (−0.34 to −0.09)	0.001
Husband's job (Reference: Freelance)	–	–
Unemployed	0.15 (−5.81 to 6.11)	0.961
Laborer	3.31 (1.34 to 4.91)	0.001
Employee	−1.31 (−4.64 to 2.02)	0.438
Husband's age (Reference: 50 <)	–	–
20–30	−0.10 (−7.33 to 7.13)	0.978
31–40	2.68 (−4.35 to 7.92)	0.453
41–50	0.12 (−7.31 to 7.08)	0.975
Economic status (Reference: Very poor)	–	–
Rich	4.94 (−9.13 to 19.02)	0.490
Moderate	6.73 (0.59 to 12.87)	0.032
Poor	5.30 (−0.96 to 11.56)	0.097
Self-rated health status (Reference: Very bad)	–	–
Very good	7.97 (−1.18 to 17.12)	0.087
Good	7.01 (−2.01 to 16.03)	0.127
Neither good nor poor	4.55 (−4.48 to 13.58)	0.322
Poor	2.26 (−7.50 to 11.02)	0.648
The effect of COVID-19 disease on receiving the pregnancy care (Reference: No)	–	–
Yes	−0.64 (−2.51 to 1.24)	0.504
Prolonged spouse's stay at home during the COVID-19 outbreak (Reference: No)	–	–
Yes	−0.46 (−2.24 to 1.33)	0.612
Reduction of the spouse income during the COVID-19 outbreak (Reference: No)	–	–
Yes	−0.97 (−3.11 to 1.17	0.373
Aggravation of the spouse behavior during COVID-19 outbreak (Reference: No)	–	–
Yes	−0.99 (−3.80 to 1.83)	0.491
The effect of COVID-19 disease on the relationship with the spouse (Reference: No)	–	–
Yes	−0.95 (−3.50 to 1.60)	0.462

In this study, pregnancy-related quality of life was at an average level with the mean score calculated as 2.77 (1.04). In an investigation performed by Zarei et al. (2018), pregnancy-related quality of life was calculated 2.9 (0.3), which is approximately near to what we obtained in our study. In both studies, the quality of life is at an average level. Indeed, COVID-19 is a source of fear, stress and anxiety and as an important factor affects the health, welfare and life quality of the people around the world (Reznik et al., 2020).

The results of the study indicated a significant relationship between fear of COVID-19 and pregnancy-related quality of life; the women with greater fear reported lower quality of life. Ahorsu, Imani, et al. (2020) and Ahorsu, Lin, et al. (2020) found in their investigation a negatively significant relationship between fear of COVID-19 in pregnant women

and their quality of mental life; the more the pregnant women's fear, the less their quality of mental life. The results of that study were consistent with those of the present investigation. Alijanpour et al. (2020) suggested in Iran to a significant relationship between pregnant women's quality of life with their stress and anxiety during prevalence of COVID-19 pandemic.

The results of the study indicated a significant relationship between the family economic status with quality of life of pregnant women, so that women whose family economic status was moderate had better quality of life than those whose family economic status was poor. Therefore, if pregnant mothers, in addition to worrying about COVID-19 disease, also have financial worries, it will probably be effective in reducing their quality of life. Lagadec et al. (2018) in a systematic review showed that lack of family economic problems improves the quality of life of pregnant women. Abbaszadeh et al. (2010) in Iran showed there is a significant relationship between family income and quality of life of pregnant women (Abbaszadeh et al., 2010). The results of these studies are consistent with the present study.

In our study, there was a significant relationship between husband's job and quality of life, so that women whose husbands were laborer had better quality of life than those whose husbands had freelance job. The freelancers were among people hit hardest by the economic challenges of COVID-19 pandemic (Vieira & Lehdonvirta, 2020), therefore, the financial worries caused by lack of income may have contributed to the poor quality of life of their wives. On the other hand, because the laborers have insurance and are paid even during the holidays, these conditions may lead to better quality of life of their wives.

The pregnancy itself puts high physical and mental pressures on the individual and if combined with other stressful factors like COVID-19 may lead to fear, stress and anxiety in pregnant women. Therefore, to overcome such fear, it is suggested that pregnant women will be trained for properly management of fear and reduction of its impacts, effective preventive and protective behaviors against COVID-19. Furthermore, they should receive emotional and psychological support from their family, especially their wife.

What seems to be important is that this group of women needs greater supports during prevalence of epidemics and disasters. In such period, health system is under high pressures, because COVID-19 has increased the capacity of the hospitals and clinics. However, the health sector can take necessary measures to improve the women's mental health and reduce fear and stress caused by such disease during this period and help decreasing its effects. The governments should develop supportive and training programs to deal with pregnant women's fear and anxiety during COVID-19 prevalence, provide necessary financial and human resources and specify a few strategies to achieve them.

One of the limitations of this research was its cross-sectional nature, in that the relationship found between fear of COVID-19 and the quality of life doesn't necessarily indicate a causal relationship. Convenience sampling is another limitation of this study that reduces the generalizability of the results of the study. There is another limitation as the possibility of response bias due to the nature of research questions that was removed by trying to assure the participants for the privacy of their information and filling the questionnaires without inserting the name. Furthermore, this study was conducted in Tabriz with Azeri people; therefore, its results cannot be generalized to other cities and ethnic groups. One of the strengths of this investigation is being carried out for the first time in Iran during prevalence of COVID-19 that can provide the policy-makers and health care professionals involved in the care of women, with the basic information required.

Conclusion

The results of this investigation are indicative of a relationship between fear of COVID-19 and the pregnancy-related quality of life; the greater the fear of COVID-19 in pregnant women, the less their quality of life. Health centers in Iran are one of the places to which pregnant

women refer during their pregnancy in order to receive health cares. Thus, it is emphasized to provide training and supportive programs in such and other related centers and make appropriate interventions necessarily in order to overcome the fear caused by COVID-19 and improve pregnant women's quality of life. Therefore, the health care policy-makers and professionals involved in caring the women especially in critical and disaster conditions such as COVID-19 pandemic should be informed about the extent of the problem and take advisable measures to resolve it. Hence, it is very important to take such measures into account not only for women's health, but also for the health of the unborn child as well as other children of the family.

Declaration of competing interest

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