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Predictors of women's sexual quality of life during the COVID-19 pandemic: An Iranian cross-sectional study

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ABSTRACT

The present study was carried out to determine the predictors of women's sexual quality of life during the COVID-19 pandemic. A total of 536 married women participated in a cross-sectional study utilizing convenience online sampling. Data were collected using a battery of psychometric scales and analyzed using stepwise multivariable linear regression. There was no significant difference in the female sexual quality of life based on COVID-19 infectious status ($p=0.92$). Having independent living conditions ($\beta=0.49$), less psychological distress ($\beta = -0.42$), higher frequency of monthly sexual intercourse ($\beta=0.20$), and less sexual distress ($\beta = -0.14$) were significant predictors of good sexual quality of life among females. The findings indicate that reducing psychological and sexual distress would likely improve women's sexual quality of life.

LAY SUMMARY

In survey of 536 married women, no significant difference was found in the female sexual quality of life based on COVID-19 infectious status. Having independent living conditions, less psychological distress, higher frequency of monthly sexual intercourse, and less sexual distress were significant predictors of their good sexual quality of life.

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Introduction

In December 2019, the coronavirus disease 2019 (COVID-19) first emerged in Wuhan, China. On March 11, 2020, the World Health Organization declared the disease a pandemic and that it was a worldwide public health emergency (Alipour, Oraki, & Kharaman, 2020). The emergence of the COVID-19 pandemic has created worldwide fear. In some cases, this has led to stigma. Moreover, the crisis has affected all aspects of individuals' quality of life, including the quality of individuals' sex lives (Huang et al., 2020; Li et al., 2020). The quality of individuals' sex lives is an important dimension of quality of life and one of the key issues in the field of sexual and reproductive health (Eghtedar, Asghari, Aparnak, Asgarloo, & Rasti, 2021; Lamyian, Zarei, Montazeri, Hajizadeh, & Maasoumi, 2016; WHO, 2018).

Sexual life is influenced by the interaction of biological, psychological, social, economic, political, cultural, ethical, legal, historical, religious, and spiritual factors (Ko et al., 2020). Crises such as earthquakes, floods, and epidemics are fundamental threats to the health, safety, and the well-being of a society, including reproductive and sexual health, are often neglected (Ardalan et al., 2009). Crises can affect various aspects of reproductive health such as live birth rate, fertility rate, marriage, contraceptive methods, and stillbirth rate, as well as quality of life (Sohrabizadeh, Jahangiri, & Jazani, 2018). In addition, in critical situations such as floods and earthquakes, changes in economic and social conditions can be associated with a reduction in various aspects of quality of life, including sexual aspects (Liang, 2015; Sohrabizadeh, et al., 2018; Tan et al., 2004). For example, the influenza epidemic has been shown to significantly reduce individuals' quality of life, increase years of disability during the disease, and affect the health system and population (Bilcke, Coenen, & Beutels, 2014; Hollmann et al., 2013).

The COVID-19 pandemic has completely changed individuals' ways of life around the world. It has also led to changes in individuals' sex lives such as sexual satisfaction, frequency of sexual activity, and frequency of contraception use based on factors such as age, gender, and general anxiety (Ko, et al., 2020; Yuksel and Ozgor, 2020). The pandemic has resulted in individuals staying at home and has completely changed interpersonal relationships and dynamics with their partners. Working from home, spatial distancing, continued presence of children at home, fear of infection, and physical contact with others, have all changed the sexual habits of many individuals (Ibarra et al., 2020). More specifically, the COVID-19 pandemic has been reported to have a negative impact on individuals' sex lives in Iran, Italy and Spain (Ibarra, et al.,

2020). Since sexual relationships can strengthen the immune system, increase physical and mental health, and help prevent COVID-19, the maintenance of sexual relationships during this period has been recommended (Cabello, Sánchez, Farré, & Montejo, 2020).

The COVID-19 pandemic can affect the quality of sexual life in different ways including its' influence on individuals' mental health. The COVID-19 pandemic has significantly affected mental health and well-being (e.g., fear, depression, anxiety, and stress) among both infected individuals and the general population (Alimoradi, Broström, et al., 2021; Alimoradi, Gozal, et al., 2021; Nguyen et al., 2020; Olashore, Akanni, Fela-Thomas, & Khutsafalo, 2021; Rajabimajd, Alimoradi, & Griffiths, 2021; Xiao, Zhang, Kong, Li, & Yang, 2020). The current situation has affected all aspects of individuals' lives both generally and sexually due to factors such as the fear of being infected, home quarantining, spatial distancing, rapid spreading of the virus through person-to-person contact, reduced perceived social support, changes in personal and social relationships, and concerns about the disease (Ibarra, et al., 2020; Lehmiller, Garcia, Gesselman, & Mark, 2020; Mirghafourvand, Charandabi, Jafarabadi, Tavananezhad, & Karkhane, 2016; Pietromonaco and Overall, 2020; Shahyad and Mohammadi, 2020). The pandemic may have affected individuals' sex lives in different ways. Some may abstain from sex because they are afraid of getting infected while others may increase the frequency of sexual behaviors with their partner due to spending more time at home with them (Yuksel & Ozgor, 2020).

To the best of the authors' knowledge, no study has exclusively examined the quality of individuals' sex lives and the factors affecting it during the COVID-19 pandemic nor specifically among women. Due to the fact that sexual quality of life is one of the important components in the success of marital relationships, the present study was designed to determine the predictors of sexual quality of life among women of reproductive age during the COVID-19 pandemic.

Methods

Design and participants

The data for the present cross-sectional study was collected between July and November 2020 in urban comprehensive health centers and coronavirus outpatient centers in Qazvin, Iran. Women who had been married for at least six months were eligible to participate in the study. The exclusion criteria included being reluctant to participate in the study, having (self-reported) physical and/or psychological illnesses, experiencing stressful events in the past three months

(including loss of loved ones), being pregnant, and currently lactating (less than six months). In the present study, 580 individuals were invited to participate in the study, of which 536 completed the survey. A total of 44 individuals declined to participate.

Sample size estimation

Green's (1991) rule was used to determine the sample size for linear multivariable regression analysis. Given there were approximately 30 predictor variables (k) in the present study and using the formula n=50+8K, the estimated minimum sample size was estimated to be 290 participants. Since cluster sampling was used, a design effect of twice this number was implemented and 580 individuals were invited to participate in the study.

Sampling procedure

Sampling was performed in two stages. In the first stage, cluster sampling was performed to select comprehensive health centers. Qazvin city has 12 urban comprehensive health centers. During the start of the pandemic, an additional comprehensive COVID-19 outpatient center was set up for individuals suspected of being infected with the virus and to follow up on individuals receiving treatment. This center included referrals for all individuals from different socio-economic backgrounds. For this reason, this center was selected as one of the research settings. Additionally, one of the health centers from each geographical area was also randomly selected.

In the second stage, simple random sampling was used. For this purpose, based on the existing lists of individual patients at the centers, individuals were randomly selected and invited to participate in the study via a telephone call. If they agreed, a link to an online survey link was sent to them. Due to COVID-19 pandemic conditions, the survey was hosted online using the *Porsline* system. The link to the online survey was sent the participants via SMS, *WhatsApp, Telegram,* or email based on their preference.

Measures and variables

The main variables examined in the present study were quality of sexual life, sexual distress, sexual intimacy, psychological distress, and fear of being infected with COVID-19. In addition, demographic variables, obstetric characteristics and COVID-19 health status were assessed as covariates. Data collection tools included the following:

Demographic/obstetric checklist: This part of the survey included two sections comprising questions relating to demographic and obstetric variables. The first section included age, level of education, occupational status, living arrangements (living with extended family or not), family income status, having a separate bedroom, details about their spouse (e.g., age, education level, occupational status), and COVID-19 status. The second section included obstetric and reproductive information such as marital duration, frequency of monthly sexual intercourse, contraceptive method, number of pregnancies, number of living children, and birth delivery methods.

Female Sexual Quality of Life Questionnaire (SQOLQ-F): The 18-item SQOLQ-F was used to assess the relationship between sexual function and women's quality of life (Symonds, Boolell, & Quirk, 2005). The scale's items are rated on a six-point scale from 1 (*strongly agree*) to 6 (*strongly disagree*). The total score is sum of the items and can range from 10-108. Higher scores indicate a better sexual quality of life. The validity and reliability of the Persian SQOLQ-F has previously been established (Pakpour, Zeidi, Saffari, & Burri, 2013). The reliability of the Persian SQOLQ-F was excellent in the present study (Cronbach alpha coefficient = 0.93).

Female Sexual Distress Scale–Revised (FSDS-R): The 13-item FSDS-R was used to assess female sexual distress (Derogatis, Clayton, Lewis-D'Agostino, Wunderlich, & Fu, 2008). The scale's items are rated on five-point scale from 0 (*never*) to 4 (*always*). A higher score indicates greater sexual distress. The total score is sum of the items and can range from 0-52. The validity and reliability of the Persian FSDS-R has been previously been established (Nekoo et al., 2014). The reliability of the Persian FSDS-R was excellent in the present study (Cronbach alpha coefficient = 0.92).

Marital Intimacy Scale (MIS): The 17-item MIS was used to assess marital intimacy (Walker and Thompson, 1983). The scale's items are rated on a seven-point scale from 1 (*never*) to 7 (*forever*). The total score is obtained from the average scores of the items and total scores can range from 17 to 119. A higher score indicates greater intimacy. The reliability of the Persian MIS has previously been established (Amanelahi, Refahi, & Rajabi, 2017; Nayeri, Lotfi, & Noorani, 2014). The reliability of the Persian MIS was excellent in the present study (Cronbach alpha coefficient = 0.97).

Psychological Distress Scale (PDS): The 10-item PDS was used to assess psychological distress (Kessler et al., 2003). More specifically, the scale's items assess the level of anxiety and

depression experienced over the past few weeks and are rated on a five-point scale from 1 (*never*) to 5 (*always*). The total score is sum of the items and can range from 10 and 50. Higher scores indicate a higher level of psychological distress (Andrews and Slade, 2001). Various studies have shown that the PDS has a good validity and reliability (Furukawa, Kessler, Slade, & Andrews, 2003). The reliability of the Persian PDS has previously been established(Lin et al., 2021). The reliability of the Persian PDS in the present study was excellent (Cronbach alpha coefficient = 0.92).

Fear of COVID-19 Scale (FCV-19S): The seven-item FCV-19S was used to assess fear of COVID-19 (Ahorsu et al., 2020). The scale's items are rated on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The total score is the sum of the items and can range from 7 to 35. Higher score indicates greater fear of COVID-19. The reliability of the Persian FCV-19S has previously been established (Ahorsu et al., 2020). The reliability of the Persian FCV-19S in the present study was very good (Cronbach alpha coefficient = 0.87).

Ethical considerations

The study was approved by institutional review board and the regional Ethics Committee (decree code IR.QUMS.REC.1399.053.) All participants were given details concerning the objectives of the study, and the confidentiality and anonymity of the data were explained. If they were willing to participate, the online survey link was sent to them. The informed consent form was included on the first page of the online survey and participants were reminded that completing the survey constituted consent to participate in the study.

Statistical analysis

Study data were analyzed using SPSS software version 24. Means and standard deviations were calculated to describe continuous quantitative variables, and frequencies and percentages were calculated to describe nominal variables. First, the normality of the distribution of sexual quality of life scores was assessed and confirmed using measures of central and dispersion distribution, histogram charts, and Shapiro-Wilk Test of normality.

Next, independent t-tests, one-way analysis of variance (ANOVA), and Pearson correlation coefficients were calculated to examine the association between sexual quality of life as a dependent variable and independent variables of the study including marital intimacy, sexual

distress, psychological distress, fear of COVID-19, and other demographic and obstetric variables. Then, considering the significance level of $p<0.05$, the variables with significant associations were entered into a multivariable linear regression model. These variables included the frequency of monthly sexual intercourse, occupational status, having a separate bedroom, living independently, marital intimacy, sexual distress, and psychological distress.

Finally, the multivariable linear regression was performed by considering sexual quality of life as the dependent variable and the selected variables from univariable analysis as the independent variables. The multivariable regression was performed utilizing the stepwise method. Normal distribution of sexual quality of life scores and lack of outlier data were verified. In the initial model, considering VIF>10 to examine the multicollinearity between independent variables (Kellar and Kelvin, 2013), two variables were removed from the model: having a separate bedroom (VIF=11.9) and sexual intimacy (VIF=11.7). After removing these two variables, multicollinearity was resolved.

Results

In the present study, the 536 women had mean age of 36.75 years, their spouse's mean age was 40.80 years, and the mean of their marriage duration was 13.66 years. The majority of women (68.3%) and their husbands (62.9%) had an academic degree. Most participants (53.4%) were housewives (53.4%). Most participants had a separate bedroom (91.8%), lived independently (87.7%, and had moderate satisfaction with their family's economic status (74.8%). Means of the scores on the psychometric scales were 89.15 for sexual quality of life (SD=17.33), 20.37 for fear of COVID-19 (5.90), 5.65 for sexual intimacy (SD=1.35), 8 for sexual distress (SD=9.11), and 21.09 for psychological distress (SD=7.77) (Table 1).

Based on univariable analysis, frequency of monthly sexual intercourse ($p<0.001$), female occupation ($p<0.01$), having a separate bedroom ($p<0.001$), living independently ($p<0.02$), sexual intimacy ($p<0.001$), sexual distress ($p<0.001$) and psychological distress ($p<0.001$) were all significantly associated women's sexual quality of life (Table 1). There was no significant difference in the female sexual quality of life based on COVID-19 infectious status ($p=0.92$). The significant variables were entered in multivariable linear regression model as independent variables utilizing the stepwise method. Multivariable regression model showed that the having independent living conditions (β=0.49), psychological distress (β=-0.42), frequency of monthly

sexual intercourse (β:0.20), and sexual distress (β=-0.14) were significant predictors of women's sexual quality of life (Table 2).

Discussion

The present study was carried out to determine the predictors of sexual quality among Iranian married women of reproductive age during the COVID-19 pandemic. The mean score of women's sexual quality of life was 89.15 out of 108 (SD=17.33). Given that higher scores indicate a better sexual quality of women's life, it appears that participants in present study reported a good quality sex life. In other studies conducted to assess the sexual quality of life among healthy women, the mean scores were similar to the present study. For example, the average score of women's sexual quality of life was 90 in the United States, 86 in Iran, and 88 in Africa (Andersson, Rymer, Joyce, Momoh, & Gayle, 2012; Maasoumi et al., 2013; Symonds, et al., 2005). Although the findings of previous studies are similar to those of the present study in terms of mean scores of women's sexual quality of life, it is noteworthy that the present study was conducted during the COVID-19 pandemic. Therefore, it appears that the pandemic has not changed overall sexual quality of life among Iranian women.

Sexual quality of life did not differ significantly regarding the COVID-19 infection status. Although the COVID-19 pandemic is globally very serious, based on the findings of the present study, it appears to be different from other crises such as floods and earthquakes. Previous studies have found individuals reporting reduced quality of life on various dimensions including sexual health after earthquakes (Liang, 2016) and severe flooding (Tan, et al., 2004). This inconsistency may be because of the different nature of the COVID-19 pandemic compared to other critical environmental situations such as floods and earthquakes. In the case of floods and earthquakes, individuals experience many acute problems such as losing their homes and lacking life's necessities. However, during the COVID-19 pandemic, individuals may have spent more time at home, and their sex lives may not have been as interrupted as other environmental crises.

Results of the multivariable model showed that having independent living conditions 9as opposed to living with an extended family), lower psychological distress, higher frequency of monthly sexual intercourse per month, and lower sexual distress were significant predictors of women's sexual quality of life during COVID-19 pandemic. Living independently was the strongest predictor of sexual quality of life with a regression coefficient of 0.49. Privacy is clearly

an influential factor in individuals' sexual lives (Panzeri, Ferrucci, Cozza, & Fontanesi, 2020). It appears that having independent living conditions creates more suitable conditions for couples' sexual relationships by providing private and independent environment such as a separate bedroom. Having this privacy allows couples to talk more freely about sex and have enough time and private space to engage in their sexual behaviors. Lack of privacy can lead to hasty sex that can be unsatisfactory for both partners.

Psychological and sexual distress were other predictors of poor quality of sex life among women. In this respect, the results of the present study are consistent with the findings of previous studies which emphasize that psychological distress (Derogatis, Meyer, & King, 1981; Gao et al., 2013) and sexual distress (Dennerstein, Guthrie, Hayes, Derogatis, & Lehert, 2008; Hayes et al., 2008; Meeuwis et al., 2011; Rosen et al., 2009) are directly associated with sexual disorders and therefore inversely related to the quality of individuals' sex lives. Negative emotions such as anxiety, worry, depression and stress, personal feelings, and psychological problems during COVID-19 quarantining can have a negative effect on sexual desire, arousal, pleasure, and satisfaction (Panzeri, et al., 2020) although that did not appear to be the case with the women in the present study. Psychiatric illnesses, especially mood and anxiety disorders, are often associated with sexual dysfunction (Hartmann, 2007; Reynaert, Zdanowicz, Janne, & Jacques, 2010).

The average frequency of monthly sexual intercourse was 5.63 (SD=4.18) in the present study. However, participants were not asked whether their frequency of monthly sexual intercourse had changed as a result of the pandemic. However, one month before the COVID-19 pandemic, a study by (Ghorbani, 2020) in a similar Iranian community was carried out to determine the predictors of sexual communication among married women of reproductive age. Here, the average frequency of monthly sexual intercourse was 6.29 (SD=4.93). Therefore, it appears that the frequency of sexual intercourse in the present study's population was not affected by the COVID-19 pandemic. However, studies elsewhere have not reported consistent findings in relation to the effect of the COVID-19 pandemic on the frequency of sexual intercourse. For example, some studies have reported increased frequency of sexual desire and sexual function (Arafat, Mohamed, Kar, Sharma, & Kabir, 2020; Cocci et al., 2020; Yuksel and Ozgor, 2020), while others have reported no change in the frequency of sexual intercourse and sexual satisfaction (Ibarra, et al., 2020; Ko, et al., 2020).

Higher frequency of sexual intercourse was another predictor of good sexual quality of life in present study, which was consistent with previous research (Auslander et al., 2007; Haavio-Mannila and Kontula, 1997). Increasing the frequency of sexual intercourse can increase sexual satisfaction and maintain sexual intimacy between couples by improving sexual communication (Frederick, Lever, Gillespie, & Garcia, 2017). Moreover, frequent sexual intercourse is associated with higher sexual satisfaction in both sexes (Schoenfeld, Loving, Pope, Huston, & Štulhofer, 2017).

Strengths, limitations, and conclusion

The present study recruited an appropriate number of participants in terms of COVID-19 infectious status and used appropriate multivariable regression methods to evaluate the predictors of women's sexual quality of life during COVID-19 pandemic. However, using a self-report method to examine the study variables, having a cross-sectional design, and lack of information concerning sexual behavior prior to the COVID-19 pandemic are all potential limitations of present study. Future studies should attempt to confirm the predictors found in the present study by employing longitudinal designs to determine true causality with larger and more representative samples. It appears that during the COVID-19 pandemic, reducing psychological and sexual distress would likely improve women's sexual quality of life although the quality of women's sex lives in the present study appeared to be good.

Declaration of interest: None to declare

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Data availability: Dataset is shared via Mendeley data repository system with DOI: 10.17632/mvm7wrgv7m.1

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Table 1. Distribution of socio-demographic variables and results of univariable analysis to determine association of these variable with sexual quality of life (using the S-QoL) as independent variable

	Range	Mean (SD)	Pearson correlation coefficient	
			r	*p*
Age	18-59 years	36.75 years (7.477)	-0.08	0.07
Spouse age	23-67 years	40.80 years (8.07)	-0.04	0.39
Marriage duration	1-42 years	13.66 years (8.39)	-0.05	0.25
Frequency of monthly sexual intercourse	0-30	5.63 (4.18)	0.26	<0.001
Sexual quality of life score	29-108	89.15 (17.33)	-	-
Fear of COVID-19 score	7-35	20.37 (5.90)	-0.06	0.20
Marital intimacy score	17-119	96.04 (22.99)	0.62	<0.001
Female sexual distress score	0-52	8 (9.11)	-0.61	<0.001
Psychological distress score	10-48	21.09 (7.77)	-0.44	<0.001
		No (%)	S_QOL Mean (SD)	ANOVA or t test p value
Education level	Below diploma	46 (8.6)	85.89 16.95)	0.33
	Diploma	124 (23.1)	90.35 (18.07)	
	Academic	366 (68.3)	89.16 (17.11)	
Education level of spouse	Below diploma	60 (11.2)	86.17 (17.28)	0.30
	Diploma	139 (25.9)	88.73 (18.72)	
	Academic	337 (62.9)	89.86 (16.72)	
Occupational status	Housewife	286 (53.4)	90.94 (16.82)	**0.01**
	Employed	250 (46.6)	87.11 (17.71)	
Occupational status of spouse	Unemployed	22 (4.1)	87.95 (14.31)	0.93
	Employed	477 (89.0)	89.25 (17.57)	
	Retired	37 (6.9)	88.68 (16.45)	
Economic status	Poor	43 (8)	86.86 (29.06)	0.64
	Fair	401 (74.8)	89.27 (17.13)	
	Good	92 (17.2)	89.80 (17.04)	
Separate bedroom	No	44 (8.2)	79.84 (18.09)	**<0.001**
	Yes	492 (91.8)	89.99 (17.03)	
Living arrangement	Living with extended family	66 (12.3)	84.55 (20.10)	**0.02**

	Independent living condition	470 (87.7)	89.80 (16.83)	
Gravid	Nuligravida	80 (14.9)	88.46 (19.81)	0.76
	Primigravida	163 (30.4)	89.96 (17.44)	
	Multigravida	293 (54.7)	88.89 (16.57)	
Number of living children	0	92 (17.2)	88.78 (19.16)	0.26
	1	180 (33.6)	90.86 (16.91)	
	>2	264 (49.3)	88.11 (16.91)	
Birth delivery	No delivery	87 (16.2)	88.79 (19.39)	0.97
	Normal vaginal delivery	159 (29.7)	89.35 (16.99)	
	Caesarian section	287 (53.5)	89.14 (16.94)	
Contraception method	No contraception	41 (7.7)	84.70 (20.42)	0.47
	Withdrawal	258 (48.1)	88.77 (17.71)	
	Condom	128 (23.9)	90.48 (15.74)	
	Sterilization	44 (8.2)	91.75 (16.45)	
	Intrauterine device	43 (8.0)	89.70 (16.68)	
	Hormonal	22 (4.1)	86.86 (18.46)	
COVID-19 status	Uninfected	210 (39.2)	88.50 (16.45)	0.92
	Infected and cured	59 (11.0)	89.31 (18.76)	
	Infected and in treatment	59 (11.0)	89.64 (17.66)	
	Suspected infection	208 (38.8)	89.63 (17.78)	

Table 2. Results of multivariable linear regression model considering sexual quality of life (S-QoL) as dependent variable

	Unstandardized coefficients		Standardized coefficients		95.0% Confidence interval for B		Collinearity statistics	
	B	Standard error	Beta	Sig.	Lower bound	Upper bound	Tolerance	VIF
Dependent living condition	47.66	2.70	0.49	<0.001	42.362	52.957	0.206	4.854
Psychological distress	1.69	0.13	0.42	<0.001	1.431	1.943	0.153	6.533
Monthly sex (number per month)	2.61	0.26	0.20	<0.001	2.094	3.118	0.393	2.544
FSD	-1.02	0.14	-0.14	<0.001	-1.308	-.741	0.429	2.328
Model Summary	R=0.957 R Square=0.915 Adjusted R Square=0.915 Durbin-Watson=1.844							