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THE EFFECT OF COVID-19 ANXIETY ON SEXUAL FUNCTION OF HEALTHCARE PROVIDERS - A CROSS-SECTIONAL SURVEY STUDY

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EFEKAT ANKSIOZNOSTI OD KOVIDA 19 NA SEKSUALNU FUNKCIJU ZDRAVSTVENIH RADNIKA – ANKETA STUDIJE PRESEKA

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ABSTRACT

Objective. Coronavirus disease epidemic in 2019 (COVID-19) posed a big challenge to healthcare providers. The present study aimed to explore the relationship between coronavirus anxiety and the sexual function of healthcare providers.

Methods. In this study, an online survey was used to explore the relationship between anxiety and sexual function in healthcare providers during COVID-19 pandemic. The questionnaire included Female Sexual Function Index (FSFI) and Corona Disease Anxiety Scale (CDAS).

Results. A total of 300 healthcare providers were investigated in this study. The estimated self-reported rates of mild anxiety symptoms were 49%, moderate 29.2% and severe were 29.9%. The total mean score of FSFI of healthcare providers were 19.1 (SD=4.4). The results showed that on the total scale, 40.9% of healthcare providers had mild anxiety. The results also indicated that female sexual function is inversely correlated with anxiety during COVID-19 pandemic. Also, it was shown that anxiety during COVID-19 is inversely correlated with sexual functioning.

Conclusion. This study presented the negative impact of the COVID-19 pandemic on anxiety and sexual function in healthcare providers. Therefore, psychological or sexual assistance may be beneficial.

Key words: *sexual behavior; anxiety; health personnel; COVID-19; surveys and questionnaires.*

SAŽETAK

Cilj. Epidemija koronavirusa iz 2019. godine (COVID-19) bila je veliki izazov za pružaoce zdravstvenih usluga. Ova studija imala je za cilj da istraži vezu između anksioznosti zbog koronavirusa i seksualne funkcije zdravstvenih radnika.

Metode. U ovoj studiji je korišćena onlajn anketa da se istraži odnos između anksioznosti i seksualne funkcije kod zdravstvenih radnika tokom pandemije COVID-19. Upitnik je uključivao Indeks ženskih seksualnih funkcija (FSFI) i Skalu anksioznosti korona bolesti (CDAS).

Rezultati. U ovu studiju bilo je uključeno ukupno 300 zdravstvenih radnika. Blage simptome anksioznosti prijavilo je 49%, umerene 29,2% i teške 29,9% ispitanika. Ukupan srednji skor FSFI zdravstvenih radnika bio je 19,1 (SD = 4,4). Rezultati su pokazali da je na ukupnoj skali 40,9% zdravstvenih radnika imalo blagu anksioznost. Rezultati su takođe pokazali da je seksualna funkcija žena u obrnutoj korelaciji sa anksioznošću tokom pandemije COVID-19. Takođe, pokazalo se da je anksioznost tokom COVID-19 u obrnutoj korelaciji sa seksualnim funkcionisanjem.

Zaključak. Ova studija je predstavila negativan uticaj pandemije COVID-19 na anksioznost i seksualnu funkciju zdravstvenih radnika. Stoga, psihološka ili seksualna pomoć može biti od koristi.

Ključne reči: *seksualno ponašanje; anksioznost; zdravstveni radnici; COVID-19; ankete i upitnici.*

INTRODUCTION

In December 2019, Severe acute respiratory syndrome coronavirus 2 (causing the disease COVID-19) has led to a global pandemic and disrupted lives and healthcare delivery systems worldwide (1). As a public health problem, this virus has generated anxiety and psychological impacts on individuals (1). Furthermore, its pandemic has been linked to a significant deal of worry, as well as the worsening of mental disorders (2, 3). According to one research, 53.8 percent of respondents evaluated COVID-19's psychological impacts as moderate to severe, with 16.5 percent and 28.8 percent experiencing related sorrow and anxiety, respectively (4). Healthcare workers are in the vanguard of the global fight against the COVID-19 outbreak, and they have received widespread media attention and public appreciation for their valiant efforts (5). Naturally, healthcare professionals are vulnerable to substantial psychological stress due to disease contact, anxiety about infecting family members, deficiency in personal protection equipment (PPE), increased working hours, and difficult decisions about allocating limited resources to patients (1, 6, 7). The COVID-19 epidemic has placed healthcare practitioners all around the world in jeopardy (8).

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One Chinese research found a significant frequency of anxiety (44.6%) among frontline healthcare professionals (9). As the epidemic moved from nation to nation, investigations looked into the health of healthcare providers (10). Cai et al.(2020) discovered that healthcare providers' stress levels were exceptionally high during the COVID-19 epidemic in a research involving 534 physicians, nurses, and primary care providers working in Hubei state (11). According to the findings of a research done in Turkey, 38% of nurses at the emergency department were stressed. In the same study, it was shown that stressed-out nurses regretted their profession choice and pondered resigning or leaving their jobs (12).

Jiang et al. (2020) performed a study with 310 participants to evaluate the healthcare providers' psychological symptoms during the COVID-19 epidemic and showed that healthcare workers experienced moderate to severe stress, and many of them felt a great deal of worry and despair (13). A Chinese research found that depression and anxiety disorders are more common among healthcare professionals in COVID-19 referral institutions (14). Finally, people's anxiety might be heightened by ambiguity about the issues they confront (15, 16). Although it may appear to be different, the relationship between mental health, mental disease, and sexual functioning has been well documented in the literature (17). In fact, appropriate sexual expression shows well-functioning mental health, and the prevalence of sexual dysfunction in depressed persons ranges from 30% to 70% (18). Despite COVID-19's tremendous impact on many parts of life, there is minimal knowledge and attention placed on protecting sexual health, and there is a scarcity of sexual health information during COVID during this time (19).

Early studies attempted to characterize the pandemic's effects on female sexual behavior and reported a significant number of female participants had unfavorable impacts on their Female Sexual Function Index (20) and had decreased overall levels of sexual activity (21-23). Some studies highlighted the relationship between sexual function and mental health (24). Women with active and gratifying sexual functions have better levels of emotional pleasure and mental health (25). According to a review paper, sexual engagement has several psychological and physiological health advantages (26). Sexual health is an important element of the human experience. It is important for overall well-being to be able to enjoy pleasant, anxiety-free emotional states and sexual dysfunction and as well as mental health issues can each have a major impact on a person's normal functioning; when combined, they can have a profoundly negative impact. Furthermore, being able to experience joyful, anxiety-free mood states is critical for general well-being and sexual dysfunction and mental health problems can hinder person's normal functioning; together, can have a significant negative influence. Considering this matter, this study aims to survey the relationship between sexual functioning and anxiety during COVID-19 in the healthcare providers.

SUBJECTS AND METHODS

We created a cross-sectional online survey to explore the relationship between sexual function and anxiety from coronavirus in healthcare professionals during Covid-19 pandemic. Study design was approved by the Ethic Committee of Sirjan School of Medical Science (IR.SIRUMS.REC.1399.031), Iran. This study was conducted on healthcare providers working in three cities of Kerman, Sirjan and Rafsanjan universities of medical science. Our inclusion criteria were, as follows: married women with at least 2 years of work experience as healthcare providers in health centers, willingness to participate in the study, not having sexual dysfunction or mental disease of themselves or their spouses, not taking medications that may influence their sexual health as well as medications for mental illness of themselves or their spouses, not abusing drugs, alcohol as well as psychedelic drugs by themselves or their spouses, not participating in sex training courses during the last 6 months, not long absence from their couple, and having a private bedroom. This study started in November, 2020 and completed in January, 2021. After explaining the objectives and methods of study, they were asked to complete in the questionnaire. All subjects provided informed consent for their participation and for their replies to be electronically kept.

This study was conducted using questionnaire, the first section of the survey explored participants' demographics. Participants provided demographic information including age, age difference with spouse, emotional relationship with spouse, education, spouse education, duration of marriage, and alcohol and drug abuse by spouse. The second section was for CDAS and the third section was for FSFI.

Corona Disease Anxiety Scale (CDAS): Alipour et al. developed this questionnaire in Iran (27). This scale's final version has 18 elements and 2 components. Items 2–8 assess psychological symptoms, whereas items 9–18 evaluate physical problems. The instrument is scored on a four-point Likert scale (never= 0, occasionally= 1, most of the time= 2, and always= 3). As a result, the highest and lowest scores in this questionnaire are 0 and 54 of which higher score indicates higher levels of anxiety. Cronbach's alpha was used to determine the tool's reliability for the source of psychological symptoms (0.879) and physical symptoms (0.861) of the first questionnaire (0.919). The researchers have classified anxiety levels as follows: psychological symptoms 0-5 (mild), 6-19 (moderate), 20-27 (severe), physical symptoms 0-1 (mild), 2-9 (moderate), 10-27 (severe) and total score 0-16 (mild), 17-29 (moderate), 30-54 (severe).

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Female Sexual Function Index (FSFI): The FSFI-6 is a 6-item, short, self-administered instrument that is based on the original 19-item FSFI that and evaluates female sexual function (28). It consists of six domains including desire, arousal, lubrication, orgasm, satisfaction, and pain. Desire and satisfaction items are scored on a 5-point Likert scale of 1 to 5, while the other items are rated on a 6-point Likert range of 0 to 5. Total score ranges between 2 to 30 of which lower scores indicates worse sexual functioning. For scoring, according to the instructions of the questionnaire designer, the scores of each field are obtained by sum of the scores of the questions of each field and multiplying it by the invoice number. The scores for the field of desire are 1-5, 0-5 for fields of arousal, lubrication, orgasm and pain, and 0 or 1-5 for the field of sexual satisfaction. A score of zero means no sex during the last 4 weeks. By summing the scores of 6 fields, the total scale score is obtained, and the higher score indicates higher sexual health. Each filed takes the maximum score of 6 and for the total scale is 36. The minimum score for the field of desire is 1.2; 0 for the fields of arousal, lubrication, orgasm and pain; 0.8 for the field of satisfaction and 2 for the total scale. The whole scale and sub-scale cut-off points are as follows: 28 for the total scale, 3.3 for desire, 3.4 for arousal, 3.4 for lubrication, 3.4 for orgasm, 3.8 for pleasure, and 3.8 for pain.

Initially, questionnaire links was sent to all healthcare providers in these three cities (N = 418) selected by census of which 308 people completed and sent back the questionnaire. 8 questionnaires were discarded due to severe information deficiencies and at the end, the information related to 300 people was analyzed. Data were analyzed using Kruskal-Wallis, Independent samples t-test and Spearman correlation coefficient by SPSS software version 19 (IBM statistic, New York, NY, USA) at a significant level of 0.05.

RESULTS

The mean (SD) age of subjects was 37.0 (5.8), in ranges of 23-55 years. Median time of Sextual was 4 in month (interquartile range (IQR) 2-6). Most of them (98.7) did not have abuse alcohol and drug. The mean (SD) duration of marriage was 11.9 (6.9). Other

Table 1. Demographic items of the study participants and FSFI and CDAS, Sirjan 2021.

Variables	N (%)	P- value* (CDAS)	P- value** (FSFI)
Age difference with spouse 0-5 6-10 >10	 192 (64.0) 106 (35.3) 2 (0.7)	 P=0.003 χ^2 =11.375	 P=0.100 χ^2 =4.613
Emotional relationship with spouse Excellent Good Medium Bad	 70 (23.3) 167 (55.7) 47 (15.7) 16 (5.3)	 P<0.001 χ^2 =59.973	 P<0.001 χ^2 =31.575
Education Diploma Associate degree Bachelor Master PhD and above	 23 (7.7) 70 (23.3) 185 (61.7) 16 (5.3) 6 (2.0)	 P<0.001 χ^2 =23.057	 P<0.001 χ^2 =22.179
Spouse education Diploma and less Associate degree Bachelor Master PhD and above	 108 (26.0) 30 (10.0) 102 (34.0) 60 (20.0) 0	 P=0.075 χ^2 =6.918	 P=0.02 χ^2 =9.821
Duration of marriage (year) 0-5 6-10 >10	 82 (27.3) 41 (13.7) 177 (59.0)	 P=5.547 χ^2 =0.062	 P=5.559 χ^2 =0.062
Alcohol and drug abuse by spouse Yes No	 90 (30.0) 210 (70.0)	 P=0.365 t =0.909	 P<0.001 t =4.729

*,** P- values were calculated by Kruskal-Wallis test and Independent samples t-test.

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information is provided in Table 1. The results by Kruskal-Wallis showed that the relationship between CDAS and age difference (P=0.003), emotional relationship with spouse (P<0.001), education (P<0.001) variables was significant. Also, the relationship between FSFI and emotional relationship (P<0.001), education (P<0.001) and spouse education (P=0.002) was significant. Furthermore, resuts of independent t-test showed that the relationship between FSFI and alcohol and drug abuse by spouse was significant (P<0.001).

The total Corona Disease Anxiety Scale scores are reported in Table 2. As this table shows, 37.7% of the participants experienced moderate physical symptoms and 55% of them experienced moderate psychological symptoms due to anxiety. According to Spearman correlation coefficient, the total score of Corona Disease Anxiety Scale is inversely related to sexual health (r = -0.39) so that each controls 15% of the other changes (R^2 = 0.15). The total score of Corona Disease Anxiety Scale is inversely related to sexual health in the field of sexual excitement (r = -0.43) and each controls 18% of the other changes (R^2 = 0.18).

The total score of coronavirus anxiety is also inversely related to sexual health in the independent fields of orgasm (r = -0.23) and sexual satisfaction (r = -0.34) so that each controls 5% and 11% of the other changes, respectively. In the field of pain, this relationship is direct and significant (r = 0.44) and based on the coefficient of determination obtained, each controls 19% other's changes (R^2 = 0.19). This relationship was not significant for lubrication (r = 0.02, p = 0.648). The results of further study of six field of sexual health in both physical and psychological dimensions are presented in Table 3.

DISCUSSION

The emerging coronavirus pandemic has been dubbed the biggest health-care challenge of the contemporary age. The present study explored the relationship between sexual function and Anxiety during COVID-19 from (COVID-19) in the healthcare providers. We administered an online survey to investigate the relationship. Our results showed that most healthcare providers (55%) experienced

Table 2. Coronavirus Disease Anxiety score during pandemic, Sirjan 2021.

Coronavirus Disease Anxiety score	Mild anxiety	Moderate anxiety	Severe anxiety	Mean ± SD
Psychological part, n/N (%)	45/298 (15.1)	164/298 (55.0)	89/298 (29.9)	15.14 ± 8.89
Physical part, N (%)	88 (29.3)	113 (37.7)	99 (33.0)	7.49 ± 7.87
Total scale, n/N (%)	122/298 (40.9)	87/298 (29.2)	89/298 (29.9)	15.75 ± 22.63

Table 3. Correlation between Female Sexual Function Index (FSFI) and Coronavirus Disease Anxiety score, Sirjan 2021.

Sexual function	Low, N (%)	Good, N (%)	Mean±SD	Coronavirus Anxiety score		
				P- value (Psychological)	P- value (Physical)	P- value (Total)
Sexual desire	209 (69.7)	91 (30.3)	2.95 ± 0.91	p=0.001 r =-0.35 R^2=0.13	p=0.001 r=-0.43 R^2=0.18	p=0.001 r=-0.39 R^2=0.15
Arousal	148 (49.3)	152 (50.7)	3.47 ± 1.50	p=0.001 r=-0.38 R^2=0.14	p=0.001 r=-0.47 R^2=0.22	p=0.001 r=-0.43 R^2=0.18
Lubrication	225 (75.0)	75 (25.0)	2.88 ± 0.83	p=0.614 r=0.03 R^2=0.0009	p=0.870 r=0.01 R^2=0.0001	p=0.648 r=0.02 R^2=0.004
Orgasm	137 (45.7)	163 (54.3)	3.40 ± 1.14	p=0.001 r=-0.18 R^2=0.03	p=0.001 r=-0.29 R^2=0.08	p=0.001 r=-0.23 R^2=0.05
Satisfaction	134 (44.7)	166 (55.3)	4.02 ± 1.70	p=0.001 r=-0.26 R^2=0.07	p=0.001 r=-0.41 R^2=0.17	p=0.001 r=-0.34 R^2=0.11
Pain	256 (85.3)	44 (14.7)	2.39 ± 1.30	p=0.001 r=0.36 R^2=0.13	p=0.001 r=0.51 R^2=0.26	p=0.001 r=0.44 R^2=0.19

r, Correlation coefficient; R^2 , Coefficient of determination; P- values were calculated by Spearman correlation coefficient.

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moderate anxiety in psychological symptoms and (37.3%) of them had physical symptoms, but on the total scale, 40.9% of healthcare providers had mild anxiety. These findings were consistent with the findings of Salari et al systematic's review and meta-analysis (29). He reported that during the COVID-19 pandemic, the prevalence of anxiety and depression in general population, including healthcare workers, was found to be 31.9% and 33.7%, respectively. Probably, increased effort, fatigue, insufficient PPE, disease risk, and the difficulty of making tough moral judgments regarding care priorities during the pandemic have subjected healthcare professionals to significant psychological demands, which have resulted in mental illnesses such as anxiety and depression (7). Also, Shahin et al. (30) found indications and symptoms of anxiety and depression in 60.2 percent and 77.6 percent of participants in a cross-sectional survey of 939 healthcare professionals during the COVID-19 pandemic. Payabast et al.(31) revealed that frontline medical professionals face a significant amount of worry at work, which is significantly greater than the healthy population. The most feasible explanation for vulnerability to anxiety illness appears to be that they are more worried about their inner experience and self-feeling as a result of their biological, psychological, and social position (32, 33). On the other hand, the most likely cause of nurses' increased stress is their workload. Their working hours in the isolated wards are significantly longer than physicians', and as a result, they have more interaction with COVID-19 patients, all of which might lead to psychological anguish. Concerns for personal safety, concerns for their families, patient mortality, concerns for their colleagues' safety, insufficient knowledge about the disease, such as uncertainty about the disease's global control, lack of appropriate treatment, and vaccination, and exhaustion are among the other risk factors (11, 34, 35). Our findings also revealed that the overall mean FSFI score of healthcare practitioners was (19.12), which is similar with Schiavietal's findings (20) who found that FSFI dropped substantially in a sample of Italian reproductive-age women during the covid pandemic (29 vs 19).

The results also indicated that the mean total FSFI scores correlated inversely with the mean total scores of anxiety ($p<0.001$) and this is in line with the results of Lopez (36) study indicating that the overall FSFI scores in mid-aged sexually active women associated inversely with the hospital anxiety and depression scale (HADS) scores, according to a research. Furthermore, there has been consistency with the results of Salomao (37) who demonstrated that infertile women with anxiety or depression had a greater risk of sexual dysfunction. These results also in line with the results of Dettore (38) demonstrating that infertile women with anxiety or depression had a higher chance of sexual dysfunction.

Furthermore, when examining the sexual function and anxiety of health workers, Guzel showed that, compared to pre-pandemic times, the level of sexual desire of the health workers ($p = 0.000$), the frequency of weekly intercourse ($p = 0.001$), the duration of foreplay ($p = 0.000$) and the duration of intercourse ($p = 0.009$) decreased during the current pandemic period. He also stated that a high anxiety score was a risk factor for decreased sexual dysfunction (OR 0.949) (39). Despite the fact that changes in sexual activity and behavior are the result of a complicated process, it is general knowledge that mental health and psychological variables are linked to sexual activity (40).

This study also highlighted a significant link between the mean total FSFI and age difference, marital duration, education, spouse education, and emotional relationship with spouse, according to the findings. In line with these results, Lopez (41) showed female and partner education were strongly associated with total FSFI-6 scores. Also, Merghati (42) demonstrated that sexual pleasure was influenced by emotional relationships. Furthermore, Aslan et al. (43) reported that sexual dysfunction was more prevalent in women with low educational level. Güvel et al. (44) reported that the educational level had no effect on sexual functions, but they also stated this result could be due to the low educational level of women participating in their study. Many studies performed abroad have shown the association of low educational level with sexual dysfunction (45-47). Studies in Nigeria (48) and Malaysia (49) reported that as the educational level rose, the incidence of sexual dysfunction increased. In a study conducted among mid-aged Ecuadorian women (50), total FSFI-6 scores positively correlated with coital frequency and female and partner educational level and inversely with female age, and partner age.

In another study performed among mid-aged sexually active Spanish women, total FSFI-6 scores displayed a positive correlation with female and partner education and negative correlation with female age (50). Similarly, men's educational level and financial index were associated with their marital happiness in an Iranian research that looked at the association of economic and demographic variables with sexual and marital satisfaction in a sample of Iranian women (51). In addition, older age of women, low education, undesired marriage, short infertility duration, and low frequency of intercourse were all linked to sexual dysfunction in an Iranian study of infertile women (48). This study also showed that the total score of Corona Disease Anxiety Scale is inversely related to sexual health. In line with these findings, Paraskevi (52) found that sadness and anxiety had a strong adverse association with sexual function in his study. According to the findings of Burhanettin Kaya's study in Turkey, total sexual function has an inverse relationship with anxiety. In a way that when the anxiety score is high, sexual dysfunction will be higher (53).

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A limitation of this study was that no data from anxiety and sexual function of healthcare providers was collected before the COVID-19 pandemic for comparison. Another issue was that the surveys were completed online, and no expert was present to provide more information on the questions. As a result, future research should look at the rate of anxiety in Iranian males, as well as the effects of variables that reduce anxiety on female and meal sexual function.

In conclusion, the results of this study indicated that sexual function was associated with individual's mental status. The results showed that most healthcare providers experienced moderate anxiety in psychological symptoms and about a third of them had physical symptoms, but on the total scale, four among ten of healthcare providers had mild anxiety. The results also indicated that Female Sexual Function is inversely correlated with Anxiety during COVID-19. Also, it was shown that anxiety during COVID-19 is inversely correlated with sexual functioning.

STATEMENTS AND DECLARATIONS

Ethics approval and consent to participate: The Ethics Committee of SIRUMS reviewed and approved the study design and all procedures (IR.SIRUMS.REC.1399.031). The aim of the study, confidentiality of the information and the right to withdraw were explained to the participants and a written consent was obtained. Questionnaires were anonymous.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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