Original Article

Impact of the COVID-19 Pandemic on Female Sexual Function: A Cross-Sectional Study

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Abstract
Aim: The aim of this research is to investigate the effect of the COVID-19 pandemic process on the female sexual function.
Method: The research was descriptive cross-sectional type. The universe of the research consisted of women between the ages of 18-65. The research was completed with 538 women. "Information form" containing questions about demographic and sexual function and "Female Sexual Function Index" were used as data collection tools. The data were obtained with an online survey application (Google Forms).
Results: In the research, the mean score of the Female Sexual Function Index was 26.13 ± 7.29. It was determined that the age of the woman, the age of her husband and the duration of marriage were associated with female sexual dysfunction. It has been determined that women who do not use contraceptive methods, who are diagnosed with COVID-19, whose economic situation is severely affected, and who report that their romantic relationship is adversely affected are at risk for female sexual dysfunction.
Conclusion: During the COVID-19 pandemic, women may experience sexual dysfunction. For this reason, it is important for health professionals to evaluate sexual function of women. Explaining preventive measures and providing sexual counseling to women at risk for sexual dysfunction can prevent the development of sexual dysfunction. Women experiencing sexual dysfunction should be referred for appropriate treatment.

Keywords: COVID-19, Female, Sexual Dysfunction, Sexuality

Introduction

The disease COVID-19 was officially declared a pandemic by the World Health Organization on March 11, 2020 (Pollard et al., 2020). In order to prevent the spread and transmission of the disease in the world, practices such as closure of borders, restriction of transportation, isolation and quarantine were started (Cankaya & Ekin Ates 2021). Restrictions such as isolation and quarantine have led to many physical and psychological effects that also affect sexual function (Kucukyildiz 2021).

Sexual function is a complex process that is controlled by anatomical neurological, vascular, hormonal, and psychosocial factors (Aolymat et al., 2023). The COVID-19 pandemic, which has caused significant changes in all areas of life, has also negatively affected the lives of couples. The stressful process of the pandemic caused both emotional and cognitive changes, negatively

affecting relationship satisfaction, dyadic adjustment, and sexual activity (Cankaya & Ekin Ates 2021). Sexuality is an important part of every woman's life (Fuchs et al., 2022). A study has shown that during the period of social restriction due to the COVID-19 epidemic, women of reproductive age have a decrease in sexual function and quality of life, despite living with their spouses for a longer period (Schiavi et al., 2020). Sexual health is not just the absence of disease, dysfunction or disability related to sexuality; it also requires physical, emotional, mental and social well-being (World Health Organization (WHO), 2023). Since sexual health is the main determinant of people's well-being, it is thought that sexual intercourse will be adversely affected during the COVID-19 pandemic. Therefore, social measures taken against COVID-19 will change the social interactions and sexual lives of women (Kaya et al., 2021).

During the COVID-19 pandemic, women were facing various challenges, including sexual health. These include difficulties such as sexual violence, loss of health and job, separation from family, lack of social and family communication, fear of COVID-19 transmission during sexual intercourse, and decreased quality of sexual intercourse (Peyravi et al., 2020.). In a study conducted during the COVID-19 isolation period, women's dissatisfaction with their sexual life, decrease in the intensity of sexual desire, low relationship satisfaction and dyadic adjustment were determined as important risk factors for sexual problems (Cankaya & Ekin Ates 2021). In another study, it was reported that some women experienced a decrease in pleasure, satisfaction, desire and arousal during the COVID-19 quarantine (Panzeri et al., 2020). Results of a study that systematically examined the effects of the COVID-19 outbreak on sexual function found that restrictions on COVID-19 were associated with higher rates of sexual dysfunction and decreased sexual activity; however, it has been shown that this change in sexual function is higher in women than in men (Masoudi et al., 2022).

There are a limited number of studies investigating the effects of the COVID-19 pandemic on female sexual function. The purpose of this research is to examine the effect of the COVID-19 pandemic process on female sexual function.

Methods

Research design and sample: The research was conducted as descriptive cross-sectional type. The universe of the research consisted of women age between 18-65 years old in Turkey between July 2021 and December 2021. The sample size was calculated using the G*Power (v3.1.7) power analysis program. The female sexual function index (FSFI) was considered as the main parameter in calculating the effective value. In the study of Yuksel and Ozgor, it was found that the FSFI score of women between the ages of 15-49 decreased by 15% compared to the pre-pandemic period (Yuksel & Ozgor 2020). Based on the results of this study, sample size was determined as 525 women with considering the degree of confidence (95%), margin of error (5%), effect size (0.5) and ability test (80%), and the data was collected with 538 women. The inclusion criteria were as follows: willingness to participate, 18-65 years old, being sexually active, knowing Turkish language and no communication barriers. The women who did not want to be included in the research for any reason, with a chronical or psychiatric diseases, and with a sexual disfunction were excluded from the research.

Data collection: The research data was collected with a 24-question information form containing demographic and sexual function data conducted by the researcher in line with the literature (Yuksel & Ozgor 2020) and female sexual function index (FSFI).

Female Sexual Function Index (FSFI): The FSFI was designed by Rosen et al., and it was tested for validity and reliability in the Turkish language by Aygin and Eti Aslan (Aygin & Eti Aslan 2005). The scale is used for defining the sexual dysfunction in women. It is a multidimensional 9-item self-report measure of sexual functioning of women in the last one month. Its subscales assess “desire”, “arousal”, “lubrication”, “orgasm”, “satisfaction” and “pain”. Range of scores for each item is from 0 to 5. To determine the total score of the FSFI, factor loadings were identified for all subscales. Factor loadings was determined as 0.6 for “desire” subscale, 0.3 for “arousal” and “lubrication”, 0.4 for “orgasm”, “satisfaction” and “pain”. The

subscales of the FSFI is multiplied by the factor loadings, the highest score to be obtained from the scale is 36, while the minimum score is 2 (Aygin & Eti Aslan 2005). The cutoff score of the scale is 26.55. A cutoff total score of ≤ 26.55 has been proposed for diagnosis of female sexual dysfunction (Wiegel et al., 2005). The Cronbach's alpha for FSFI was 0.98, (Aygin & Eti Aslan 2005) and in this research the Cronbach's alpha was 0.96. The data was obtained by online survey application (Google Forms).

Data analysis: SPSS (Windows 22.0) software was used for data analysis. Descriptive statistical methods (mean, standard deviation, mode, median, frequency, minimum and maximum) were used for statistical analysis of data and Mann Whitney U, Chi square tests were calculated for determining the relationship between the descriptive tests and scale.

Ethical considerations: Ethics committee approval was obtained from the Non-invasive Clinic Ethical Committee of a university (Decision no: 61351342/June 2021-30; Date: 28.06.2021). After obtaining ethical approval, the research was registered on the Scientific Research Studies Application Platform created by The Ministry of Health of Turkish Republic, and the necessary institution permission was obtained. Verbal and written consent was obtained from the participants who met the criteria for being included in the research sample and agreed to participate in the research. The research was conducted in accordance with the Declaration of Helsinki.

Results

The sociodemographic and gynaecologic data of women are presented in Table 1. The mean age of women was 34.21 ± 8.39, and the mean age of partner was 37.76 ± 8.89. The mean marriage year of women was found 10.41 ± 8.39. The 33.69% (n = 181) of them had graduate education level. The 49.6% of them are working. Most of women (52.6%) were in normal BMI range (18,5-24,9 kg/m2). It was found that 59.1% (n = 318) of the women used contraception method, and the most used contraception method was male condom (32.5%, n = 175). The rate of women in menopause was only 9.1% (n = 49) (Table 1).

The data about COVID-19 pandemic period are shown in Table 2. While the mean sexual intercourse number per week before pandemic was found as 2.14 ± 1.15, it was found as 2.47 ± 1.36 in pandemic period. The 36.4% (n = 196) of women diagnosed with COVID-19, and 36.4% of their partner diagnosed with COVID-19, too. It was found that 39.4% (n = 212) of women stated that COVID-19 pandemic moderately adversely affected their economic situation.

It was determined that 12.8% (n = 69) of them had an increased sexual intercourse time, and 16.2% (n = 87) of them had an increased sexual arousal. The 20.0% (n = 108) of women and 12.5% (n = 67) of their partner abstained from sexual intercourse during pandemic (Table 2).

The mean scale scores of the women are as follows. The mean FSFI score was found 26.13 ± 7.29 (*Min:* 2; *Max:* 36). Desire subscale score 3.82 ± 1.05 (*Min:* 1; *Max:* 6); arousal subscale score 4.02 ± 1.36 (*Min:* 0; *Max:* 6); lubrication subscale score 4.31 ± 1.37 (*Min:* 0; *Max:* 6); orgasm subscale score 4.41 ± 1.44 (*Min:* 0; *Max:* 6); satisfaction subscale score 4.76 ± 1.51 (*Min:* 0; *Max:* 6); pain subscale score was found to be 4.79 ± 1.47 (*Min:* 0; *Max:* 6).

The correlation between FSFI and characteristics of the women are shown in Table 3. A statistically significant negative and weak correlation was found between FSFI total score and age (r = -0.260; p= 0.001), partner age (r = -0.267; p = 0.001) and duration of marriage (r = -0.086; p = 0.046).

The comparison of the characteristics of women and FSFI score is presented in Table 3. It was determined that the mean FSFI total scale score was higher in women who used contraception method than women who do not use (*Zmwu* = -2.759; p = 0.006). A statistically significant difference was found between FSFI total score and diagnosed with COVID-19 (*Zmwu* = -2.709; p = 0.007), but there was no statistically significant difference between desire, arousal, lubrication and satisfaction subscales (p > 0.05).

A statistically significant difference was found between FSFI total score and pandemic

effect on economic situation (X^2 = 37.309; p = 0.001).

According to the Post Hoc Tukey HSD test, FSFI total score was higher in slightly adversely affected than severely adversely affected ($p < 0.05$), and FSFI total score was higher in 'moderately adversely affected' than 'severely adversely affected' ($p < 0.05$).

Changes in romatic relationship during pandemic were found to significantly affect sexual function (X^2 = 39.266; p = 0.001).

According to the Post Hoc Tukey HSD test, FSFI total score was higher in 'not affected' than 'negatively affected'($p < 0.05$), and FSFI total score was higher in 'positively affected' than 'negatively affected'($p < 0.05$).

Table 1. Characteristics of Women

Variables	**X̄ ±(SD)**	**Min-Max**
Age	34.21±8.39	20-56
Partner Age	37.76±8.89	22-60
Duration of Marriage (year)	10.41±8.39	1-33
Parity	1.73±2.74	0-5
Number of Child	1.46±1.13	0-5
Duration of Menopause	0.24±0.90	0-7
Education Level	**n**	**%**
Primary School	106	19.7
High School	100	18.6
Graduate	181	33.6
Master Degree	151	28.1
Working Status		
Employed	267	49.6
Unemployed	271	50.4
BMI		
<18,49 kg/m2	14	2.6
18,5-24,9 kg/m2	283	52.6
25-29,9 kg/m2	198	36.8
>30 kg/m2	43	8.0
Contraception Use		
Yes	318	59.1
No	220	40.9
Type of Contraception		
Combine Oral Contraception	65	12.1
Male Condom	175	32.5
Intrauterine Device	47	8.7
Withdrawal for Contraception	40	7.4

Tubal Ligation	22	4.1
Menopausal Status		
Yes	49	9.1
No	479	90.9

BMI: Body Mass Index

Table 2. Data on The COVID-19 Pandemic Period

Variables	**X̄ ±(SD)**	**Min-Max**
Number of Sexual İntercourses Per Week Before Pandemic	2.14±1.15	1-6
Number of Sexual İntercourses Per Week in Pandemic	2.47±1.36	1-7
Diagnosed with COVID-19	**n**	**%**
Yes	196	36.4
No	342	63.6
Partner Diagnosed with COVID-19		
Yes	196	36.4
No	342	63.6
Pandemic Effect on Economic Situation		
Slightly Adversely Affected	125	23.2
Moderately Adversely Affected	212	39.4
Severely Adversely Affected	82	15.2
Not Affected	119	22.2
Cigarette Consumption in The Pandemic		
Not Using	425	79.0
Decreased	1	0.2
Increased	33	6.1
Not Changed	79	14.7
Alcohol Consumption in The Pandemic		
Not Using	382	71.0
Decreased	9	1.7
Increased	18	3.3
Not Changed	129	24.0
Change in Sexual Intercourse Time During Pandemic		
Increased	69	12.8
Decreased	34	6.3
Not Changed	435	80.9

Change in Sexual Arousal During Pandemic		
Increased	87	16.2
Decreased	76	14.1
Not Changed	375	69.8
Abstinence From Sexual Intercourse During Pandemic		
Yes	108	20.0
No	430	80.0
Reasons of Abstinence		
Loss of Sexual Desire	107	19.9
Risk of COVID-19 Contagious	23	4.3
Stress	2	0.4
Partner Abstinence From Sexual İntercourse During Pandemic		
Yes	67	12.5
No	471	87.5
Partner Reasons of Abstinence		
Loss of Sexual Desire	11	2.0
Tiredness	16	3.0
Changes in Romatic Relationship During Pandemic		
Positively Affected	95	17.7
Negatively Affected	100	18.5
Not Affected	343	63.8

Table 3. The Comparison of Women's Characteristics and Scale Scores

Characteristics	FSFI Total		Desire		Arousal		Lubrication		Orgasm		Satisfaction		Pain	
	r	P	r	P	r	P	r	P	r	P	r	P	r	P
Age	-0.260	0.001	-0.330	0.001	-0.324	0.001	-0.162	0.001	-0.127	0.003	-0.319	0.001	0.970	0.024
Partner Age	-0.267	0.001	-0.373	0.001	-0.311	0.001	-0.126	0.003	-0.121	0.001	-0.368	0.001	0.910	0.035
Duration of Marriage	-0.086	0.046	-0.204	0.001	-0.159	0.001	-0.089	0.039	-0.116	0.007	-0.101	0.019	0.200	0.001
Contraception Use	$\bar{X}$ ±(SD)	Z_{MWU} P	$\bar{X}$ ±(SD)	Z_{MWU} P	$\bar{X}$ ±(SD)	Z_{MWU} P	$\bar{X}$ ±(SD)	Z_{MWU} P	$\bar{X}$ ±(SD)	Z_{MWU} P	$\bar{X}$ ±(SD)	Z_{MWU} P	$\bar{X}$ ±(SD)	Z_{MWU} P
Yes	27.22±5.87	-2.759	3.89±1.02	-1.037	4.23±1.18	-2.885	4.43±1.13	-1.502	4.58±1.28	-3.202	4.91±1.30	-1.673	5.15±1.04	-5.842
No	24.57±8.72	0.006	3.70±1.09	0.300	3.72±1.53	0.004	4.14±1.64	0.133	4.16±1.63	0.001	4.53±1.75	0.094	4.28±1.82	0.001
Diagnosed With COVID-19														
Yes	26.02±5.98	-2.709	3.74±1.09	-1.367	4.06±1.32	-0.029	4.32±1.00	-1.746	4.37±1.18	-2.845	4.79±1.21	-1.381	4.71±1.18	-4.265
No	26.24±8.14	0.007	3.88±1.02	0.172	4.00±1.40	0.977	4.30±1.59	0.081	4.44±1.62	0.004	4.73±1.70	0.167	4.86±1.66	0.001
Pandemic Effect on Economic Situation	$\bar{X}$ ±(SD)	X^2 P	$\bar{X}$ ±(SD)	X^2 P	$\bar{X}$ ±(SD)	X^2 P	$\bar{X}$ ±(SD)	X^2 P	$\bar{X}$ ±(SD)	X^2 P	$\bar{X}$ ±(SD)	X^2 P	$\bar{X}$ ±(SD)	X^2 P
Slightly Adversely Affected	26.12±9.29		3.92±1.19		4.26±1.45		4.32±1.82		4.30±1.78		4.64±1.94		4.67±1.59	
Moderately Adversely Affected	27.30±4.20	37.309	3.99±0.94	19.681	4.06±1.06	22.574	4.38±0.65	12.993	4.71±0.84	34.835	5.16±0.83	60.607	4.98±0.99	18.944
Severely Adversely Affected	21.61±8.62	0.001	3.43±0.99	0.001	3.34±1.56	0.001	3.77±1.82	0.001	3.54±1.68	0.001	3.75±1.64	0.001	3.76±2.03	0.001
Not Affected	27.19±7.10		3.67±1.06		4.18±1.46		4.55±1.32		4.59±1.49		4.86±1.51		5.32±1.23	
Changes in Romatic Relationship During Pandemic														
Positively Affected	26.71±6.91	39.266	3.82±0.95	30.072	4.39±1.19	35.376	4.63±1.63	63.893	4.21±1.42	20.131	4.82±1.62	15.839	4.82±0.97	57.145
Negatively Affected	21.67±9.80	0.001	3.41±1.31	0.001	3.44±1.51	0.001	3.30±1.59	0.001	3.77±1.93	0.001	4.06±2.00	0.001	3.67±2.03	0.001
Not Affected	27.02±6.12		3.89±0.96		4.05±1.32		4.47±1.09		4.61±1.24		4.92±1.28		5.06±1.27	

r: Spearman's correlation Zmwu: Mann Whitney U X^2: Kruskall Wallis $p<0.05$

Discussion

The mean FSFI total score in the study was 26.13 ± 7.29. Those with a total FSFI score of 26.55 and below are considered to have sexual dysfunction (Wiegel et al., 2005). According to this criterion, it is understood that the women participating in the study experienced sexual dysfunction. The study of Fuchs et al. (2020) showed that the overall score result of FSFI decreased significantly during the pandemic (Fuchs et al., 2020), while the study of Narkkul et al. (2022) showed that 60% of women are at risk for sexual dysfunction (Narkkul et al., 2022). In line with this information, it can be said that the pandemic has a negative effect on female sexual function.

In the study, it was determined that the age of the woman, the age of her husband and the duration of marriage were associated with sexual dysfunction. In the literature on this subject; there are studies showing that there is no difference in age and duration of marriage during the COVID-19 isolation process, and between women with and without sexual dysfunction (Cankaya & Ekin Ates 2021; Bhambhvani et al., 2021). At the same time, there are studies showing that the age of the spouse is more than 35 and the duration of marriage between five and ten years are predictors of female sexual dysfunction (Omar et al., 2021). From the findings of the study, it is thought that individual characteristics may affect sexual function.

In the study, it was determined that there was a statistically significant difference between the use of contraceptive method and female sexual function. The FSFI total score (24.57 ± 8.72) who do not use contraceptive methods shows that they experience sexual dysfunction. In the COVID-19 pandemic, some problems were encountered in accessing family planning services and using contraceptive methods (Eren & Kucukkaya 2022.). The study of Yuksel and Ozgor (2020) showed that the use of contraception during the pandemic decreased significantly compared to the previous period (Yuksel & Ozgor 2020). In addition, there are other studies showing a decrease in family planning services during the pandemic period (Esmeray et al., 2021; Abdela et al., 2020). Problems related to family planning services may also lead to an increase in unwanted pregnancies and related complications. It can be said that the use of contraceptive methods during the pandemic process is important for healthy sexual function and family planning.

In the study, a statistically significant difference was found between the status of being diagnosed with COVID-19 and female sexual function. The FSFI total score (26.02 ± 5.98) of women diagnosed with COVID-19 shows that they experience sexual dysfunction. In the study of Gencer et al. (2022), sexual dysfunction was found to be higher in women with a history of COVID-19 than in women without a history of COVID-19 (Gencer et al., 2022). In a study comparing the sexual function of women before and after COVID-19 infection, it was determined that there was a significant decrease in the sexual function of women infected with COVID-19. It is believed that social limitations and not knowing what will happen in the future affect people's lifestyle and sexual function (Nawaz et al., 2021). During the epidemic, social distancing is expected to reduce the risk of transmission. Social distance negatively affects sexual activity (Sahin & Satılmıs 2020.). Women are more likely to show less sexual activity during this period (Nawaz et al., 2021).

In the study, a statistically significant difference was found between the effect of the pandemic on the economic situation and the female sexual function. When the FSFI total scores are examined, it is understood that those who report that their economic status is severely adversely affected experience sexual dysfunction. In the study of Cankaya and Ekin Ates (2021), it was determined that women with a decrease in income during the COVID-19 isolation period experienced more sexual problems (Cankaya & Ekin Ates 2021). Turliuc and Candel's (2021) study showed that couples with low socioeconomic status are more prone to more stress and lower marital satisfaction levels (Turliuc & Candel 2021). The negative change in the economic situation has created an effect that impairs sexual function in women.

In the study, a statistically significant difference was found between changes in

romantic relationships and female sexual function during the pandemic. When the FSFI total scores are examined, it is understood that those who report that their romantic relationship is negatively affected have sexual dysfunction. In the study of Cankaya and Ekin Ates (2021), it was determined that women whose romantic relationship satisfaction decreased during the COVID-19 isolation period experienced more sexual problems (Cankaya & Ekin Ates 2021). The study of Fernandes et al. (2021) showed that there is a decrease in marital satisfaction during the COVID-19 pandemic phase (Fernandes et al., 2021). During the COVID-19 pandemic, many people have experienced anxiety, depression, panic, unemployment, economic problems, and these conditions have affected people's sexual activities. In this regard, under unusual circumstances, sexual behavior can change dramatically. When people are forced to distance themselves from their sexual partners, this can affect their relationships emotionally, which in turn affects their sexual behavior (Masoudi et al., 2022).

Conclusion: During the Covid-19 pandemic, the age of the woman and her husband, the duration of marriage, the use of contraceptive methods, the diagnosis of COVID-19, the economic situation and changes in romantic relationships were found to be risk factors affecting sexual function in women. Considering that sexual dysfunction may develop in women during the COVID-19 pandemic, it is important to evaluate women in terms of sexual function. For healthy sexual function, women who are at risk in terms of sexual dysfunction should be informed about preventive measures and should be guided to get counseling. Women with sexual dysfunction should be provided with treatment.

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