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CLINICAL ARTICLE

Obstetrics

Risk factors for sexual dysfunction in pregnant women during the COVID-19 pandemic

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Abstract

Objective: To evaluate the level of sexual function during the COVID-19 pandemic in pregnant women followed up in Baskent University Faculty of Medicine, Turkey, using the Female Sexual Function Index (FSFI).

Methods: An observational analysis was performed on pregnant women who were not infected with COVID-19. A total of 135 pregnant women (group 1), 45 of whom were in the first trimester, 45 in the second trimester, and 45 in the third trimester, and 45 healthy women who were not pregnant (group 2), were included in the study. The FSFI was used to assess sexual dysfunction status.

Results: A total of 118 (87.4%) pregnant participants and 31 (68.9%) non-pregnant participants were diagnosed as having sexual dysfunction according to the FSFI. When comparing groups 1 and 2, FSFI scores were significantly lower in group 1 (p = 0.002). It was also found that women who had university degrees, were multiparous, and in the third trimester were more likely to develop sexual dysfunction (p = 0.030, p = 0.029, and p = 0.001, respectively). FSFI scores were found to be significantly higher in planned pregnancies than in unplanned pregnancies (p = 0.001).

Conclusion: The sexual function of uninfected pregnant women decreased during the COVID-19 pandemic, negatively influenced by restrictive social distancing measures.

KEYWORDS
COVID-19 pandemic, Female Sexual Function Index (FSFI), Pregnancy, Sexual dysfunction

1 | INTRODUCTION

The WHO announced COVID-19 as a global pandemic in March 2020.[1] The first case of the virus, which rapidly spread around the world, was first reported in Turkey on March 11, 2020.

Isolation policies during the pandemic, changes in daily routine, restrictions on personal activities, and uncertainty of the future affected people's quality of life and sex life.[2,3] A study on the effect of social isolation on sexual dysfunction in the general population in the UK in March 2020 demonstrated that the prevalence of sexual activity was below 40%.[4]

Previous studies have stated that great disasters cause increased anxiety and negatively affect sexual function.[5-7] During the COVID-19 pandemic, pregnant women face an increased risk of hospitalization and increased concern.[8] Pregnancy is one of the periods when sexual dysfunction is most common among women.[9-11] However, to the authors' current understanding, it is believed that there are no published studies evaluating the sexual function of pregnant women.

Nowadays, although sexual activity is not the only cause of concern, it is believed that information regarding sexual dysfunction in pregnant women must also be recorded when establishing surveillance systems for the COVID-19 pandemic. The aim of the present

study was to compare the levels of sexual function of pregnant women and non-pregnant women during the COVID-19 pandemic using the Female Sexual Function Index (FSFI), and to determine the factors affecting the changes in sexual function in pregnant women.

2 | MATERIALS AND METHODS

The present prospective study was performed between July and August 2020, during the COVID-19 pandemic (1 month after the restrictive policies were issued) in Baskent University Hospital, Turkey. Ethical approval was obtained from the university's Clinical Research Ethics Committee (Project no. KA20/274). A total of 135 healthy pregnant female volunteers, 45 of whom were in the first trimester (<13 weeks of pregnancy), 45 in the second trimester (13–26 weeks of pregnancy), and 45 in the third trimester (>26 weeks of pregnancy), who were admitted for their antenatal follow-ups, were included in the study. A total of 45 healthy non-pregnant female volunteers were enrolled as the control group. All women included in the study were aged 20–40 years, sexually active, and had been living together with their partner for 3 months before their enrollment in the study. Pregnant women with complications such as bleeding, risk of miscarriage, placenta previa, risk of preterm delivery, psychological or psychiatric co-morbidities, women with high-risk pregnancies who were abstaining from sexual intercourse, and women with chronic pelvic pain, deep endometriosis, neurogenic bladder, urinary incontinence, and a history of gynecologic or oncologic disease were excluded from the study. Patients who tested positive for COVID-19 or who were living with someone suspected of having COVID-19 were also excluded from the study.

Written consent from each participant was obtained and the participants were invited to complete the questionnaire, which comprised 38 questions and took 30 minutes to complete. The women completed the questionnaires alone in a meeting room in the outpatient clinic. In the questionnaire, 19 questions were on obstetric and demographic characteristics such as age, marital status, level of education, employment status, level of income, use of tobacco, gestational week in pregnancy, parity, mode of delivery in a previous pregnancy, and the number of children delivered. The remaining 19 questions were generated using questions in the FSFI translated into Turkish in 2005 by Oksuz et al.[12] For these 19 questions, they were asked to evaluate the last 4 weeks in the COVID-19 pandemic. Questions in the FSFI assess six domains: (1) desire (questions 1 and 2, score of 1–5); (2) arousal (questions 3, 4, 5, 6, score of 0–5); (3) lubrication (questions 7, 8, 9, 10, score of 0–5); (4) orgasm (questions 11, 12, 13, score of 0–5); (5) satisfaction (questions 14, 15, 16, score of 1–5); and (6) pain (questions 17, 18, 19, score of 0–5). The total index score was calculated by adding the scores of the six domains on a computer. After the answers were analyzed individually, the appropriate mean score of all three trimesters of pregnancy was calculated. The cutoff value of the total FSFI score for the diagnosis of sexual dysfunction was accepted as less than 26.55, as determined by Wiegel et al.[13]

When the study was planned, the sample size was calculated using G*Power 3.0.10 software (Franz Faul, Universität Kiel, Kiel, Germany). If an effect size of 0.25 was desired, according to one-way analysis of variance (ANOVA), it was found that at least 180 participants (at least 45 participants in each group) must be included in the study to test the statistical significance of the differences between the groups (control, first trimester, second trimester, third trimester) with 80% power and 5% alpha.

Data were analyzed using the SPSS 24.0 software package (IBM Corp., Armonk, NY, USA). The variables were investigated using the Kolmogorov–Smirnov or Shapiro–Wilk test to determine whether they were normally distributed. Continuous data were analyzed using descriptive statistics including mean, standard deviation, frequencies, and percentages. The inferential statistics tests used were the independent *t*-test for continuous data, and the independent χ^2 test and Fisher exact test for categorical data. $P < 0.050$ was considered statistically significant. For non-normally-distributed variables, descriptive analyses are presented using median values. Kruskal–Wallis tests were conducted to compare these parameters. The Mann–Whitney *U* test was performed to test the significance of pairwise differences using Bonferroni correction to adjust for multiple comparisons. An overall 5% type-I error level was used to infer statistical significance.

3 | RESULTS

The questionnaire was administered to 204 volunteers. A total of 180 healthy women who met the study criteria were included in the study. Of these women, 147 (81.7%) were university graduates and 119 (66.1%) were employed.

Of the participants, 135 were pregnant (group 1) and 45 were non-pregnant (group 2). The demographic data and descriptive characteristics of the groups are presented in Table 1. There was no significant difference between the groups in terms of patient characteristics.

The median FSFI score was 22.2 ± 7.2 (range 2–33.4) in the study population. By using the cutoff FSFI score of 26.55, 118 (87.4%) pregnant women and 31 (68.9%) non-pregnant women were diagnosed as having sexual dysfunction. The mean score of each FSFI domain in all cohorts and comparisons between pregnant and non-pregnant women in terms of each FSFI domain are shown in Table 2. When groups 1 and 2 were compared, it was found that FSFI scores were significantly lower in group 1 ($p = 0.002$).

The median score of each FSFI domain between women in the first, second, and third trimesters is summarized in Table 3. It was determined that women in the third trimester had significantly lower scores in each FSFI domain than women in the early stages of gestation ($p < 0.050$).

The relationship between the presence of sexual dysfunction and demographic variables in pregnancy is demonstrated in Table 4. It was found that women who had university degrees, are multiparous, and in the third trimester were more likely to develop sexual

TABLE 1 Demographic data and descriptive characteristics of the pregnant and non-pregnant women[a]

Characteristics	Pregnant (group 1) (n = 135)	Non-pregnant (group 2) (n = 45)	*P* value
Age (years)	34 ± 4.73 (22–40)	34 ± 4.76 (23–39)	<0.050
Marital status			<0.050
Married	135	45	
Single	0	0	
Level of education			<0.050
Primary school	4 (3)	0	
High school	52 (38.5)	12 (26.7)	
University	83 (61.5)	33 (73.3)	
Employment status			<0.050
Not working	46 (34.1)	30 (66.7)	
Working	89 (65.9)	15 (33.3)	
Socioeconomic status			<0.050
Low	12 (8.9)	4 (8.9)	
Middle	71 (52.6)	19 (42.2)	
High	52 (38.5)	22 (48.9)	
Use of tobacco			<0.050
Yes	20 (14.9)	13 (28.9)	
No	115 (85.1)	32 (71.1)	
Parity	1 ± 0.6 (0–3)	1 ± 0.9 (0–3)	<0.050
Nulliparous	85 (63)	23 (51.1)	
Multiparous	50 (37)	22 (48.9)	
Delivery mode (*n* = 72)			
Cesarean delivery	31 (23)	6 (13.3)	<0.050
Vaginal birth	19 (14)	16 (35.6)	

[a]Values are given as number (percentage) or mean ±SD (range).

dysfunction ($p = 0.030$, $p = 0.029$, and $p = 0.001$, respectively). FSFI scores were observed to be significantly higher in planned pregnancies than in unplanned pregnancies ($p = 0.001$).

4 | DISCUSSION

In the present study, the prevalence of sexual dysfunction in pregnant women during the COVID-19 pandemic was 87.4%. It was found that sexual dysfunction as diagnosed using the FSFI was higher in pregnant women compared with non-pregnant women. Being a university graduate, multiparous, and having an unplanned pregnancy were found to be associated with low FSFI scores in pregnant women. When trimesters were compared, it was determined that FSFI scores decreased as the trimester increased. It is believed that this is the first study in the literature to analyze the change in sexual function in pregnant women during the COVID-19 pandemic.

A study from China showed that the COVID-19 pandemic caused higher levels of stress, anxiety, and depression in women than in men.[14] In an Italian study that evaluated the FSFI scores of 89 women and excluded pregnant women, it was found that FSFI scores had decreased compared with the pre-COVID-19 period.[15] Sexual dysfunction during the COVID-19 period was attributed to the acute stress caused by the isolation policies issued by the government and the difficulty of adapting to new daily life practices.

Before the COVID-19 pandemic, various studies in the literature found that the prevalence of sexual dysfunction among pregnant women was in the range of 37%–94%, with different scoring systems and cutoff points of the FSFI.[10,11,16-18] Kucukdurmaz et al.[17] conducted a cross-sectional prospective study among 207 Turkish pregnant women in 2016 using the FSFI with a cutoff value similar to that in the present study, and they reported the prevalence of sexual dysfunction as 87%. It is believed that the power analysis performed when planning the present study may enable it to be evaluated comparatively with the study by Kucukdurmaz et al.[16] When the demographic characteristics of the study groups were compared, it was found that 18% of the women in the study by Kucukdurmaz et al were university graduates, whereas the majority of the population in the present study were pregnant women with university degrees. In addition, it was found that having a university degree was a factor that increased sexual dysfunction in the pregnant women

TABLE 2 Median score of each FSFI domain in all cohorts and the comparison between the pregnant and non-pregnant groups in terms of each FSFI domain[a]

FSFI domains	All women (n = 180)	Pregnant (group 1) (n = 135)	Non-pregnant (group 2) (n = 45)	Univariate *p* value
Desire	3.0 ± 1.1 (0–6)	3.0 ± 1.1 (0–6)	3.0 ± 1.0 (0–6)	**0.014**
Arousal	3.0 ± 1.2 (0–6)	3.0 ± 1.1 (0–6)	3.0 ± 1.4 (0–6)	0.213
Lubrication	3.6 ± 1.7 (0–6)	3.6 ± 1.6 (0–6)	4.2 ± 1.8 (0–6)	0.052
Orgasm	4.0 ± 1.4 (0–6)	4.0 ± 1.4 (0–6)	4.0 ± 1.5 (0–6)	0.392
Satisfaction	3.6 ± 1.4 (0–6)	3.6 ± 1.4 (0–6)	3.6 ± 1.5 (0–6)	0.131
Pain	4.0 ± 1.4 (0–6)	4.0 ± 1.3 (0–6)	4.8 ± 1.6 (0–6)	**0.001**
FSFI	22.2 ± 7.2 (2.0–33.4)	21.9 ± 6.9 (2.0–30.2)	23.4 ± 8.37 (2.0–33.4)	**0.002**

Abbreviation: FSFI, Female Sexual Function Index.

The *p* values deemed significant per The Mann–Whitney U test analysis ($P < 0.05$) are shown as bold.

[a]Values are given as number (percentage) or mean ± SD (range).

TABLE 3 The median score of each FSFI domain between women in the first, second, and third trimesters[a]

FSFI domains	Trimester 1 (n = 45)	Trimester 2 (n = 45)	Trimester 3 (n = 45)	*P* value
Desire	3.6 ± 1.1 (1.2–4.8)	3.0 ± 0.9 (0–4.2)	3.0 ± 1.1 (0–4.2)	0.002
Arousal	3.6 ± 1.4 (0–6)	3.0 ± 0.8 (0–3.9)	3.0 ± 1.2 (0–3.9)	0.001
Lubrication	4.2 ± 1.2 (0–6)	3.6 ± 1.2 (0–5.7)	2.7 ± 1.8 (0–5.7)	0.001
Orgasm	4.0 ± 1.2 (0–6)	4.0 ± 1.2 (0–5.6)	3.6 ± 1.5 (0–5.2)	0.003
Satisfaction	4.4 ± 1.4 (0–6)	3.6 ± 1.1 (0–5.2)	3.6 ± 1.3 (0–6)	0.001
Pain	4.0 ± 1.2 (0–6)	4.0 ± 1.2 (0–6)	3.6 ± 1.4 (0–4.8)	0.005
FSFI	24.0 ± 6.0 (2.0–34.2)	22.0 ± 5.7 (2.0–24.8)	19.1 ± 7.3 (2.0–23.2)	0.001

Abbreviation: FSFI, Female Sexual Function Index.
[a]Values are given as number (percentage) or mean ± SD (range).

TABLE 4 The relationship between the presence of sexual dysfunction and demographic variables in pregnancy[a]

Characteristics	FSFI <26.6 (n = 118)	FSFI >26.6 (n = 17)	*P* value
Age (years)			0.180
<30	36 (81.8)	8 (18.2)	
≥30	82 (91.1)	9 (0.9)	
Level of education			**0.030**
High school graduate	41 (78.8)	11 (21.2)	
University graduate	77 (92.8)	6 (7.2)	
Employment status			0.587
Not working	39 (84.8)	7 (15.2)	
Working	79 (88.8)	10 (11.2)	
Level of income			0.439
Income less than or equal to expenses	74 (89.2)	9 (10.8)	
Income more than expenses	44 (84.6)	8 (15.4)	
Parity			**0.029**
Multiparous	48 (96)	2 (4)	
Nulliparous	70 (82.4)	15 (17.6)	
Trimester			
1st and 2nd trimesters	73 (81.1)	17 (18.9)	**0.001**
3rd trimester	45 (100)	0 (0)	
Planned pregnancy			**0.001**
Yes	41 (74.5)	14 (25.6)	
No	77 (96.2)	3 (3.8)	

Abbreviation: FSFI, Female Sexual Function Index.
[a]Values are given as number (percentage).

in the present study. Thus, the prevalence of sexual dysfunction during the COVID-19 pandemic was expected to be higher than that in the cross-sectional study by Kucukdurmaz et al. The similarity of the prevalence rate in both studies may be due to the sample size or the fact that women with a higher level of education had higher levels of awareness and knowledge and showed full compliance with the rules. Moreover, in the present study, 66.1% of the women were working. In Turkey, women at 24 weeks of pregnancy or more are considered to be on administrative leave after June 2, 2020, and worked from home. The increase in the time spent at home and increased quality of life for the working pregnant women in Turkey may be responsible for this similar rate.

During the COVID-19 pandemic, Schiavi et al.[15] found that the FSFI scores of multiparous women were low. Similarly, in the present study, it was found that multiparity was a factor that increased sexual dysfunction. It can be presumed that the pregnant women's increased anxiety regarding the child she cares for at home as well as the anxiety regarding the well-being of herself and the fetus could be a factor.

Before the COVID-19 pandemic, there were many studies in the literature demonstrating that sexual function decreased in pregnant women, especially in the third trimester.[9,10,17-19] In the present study, dysfunction was detected in all pregnant women in the second and third trimesters. In addition, it was found that FSFI scores were significantly lower in women who had not planned to get pregnant compared with women with planned pregnancies. The significantly increased sexual dysfunction in the later months of pregnancy might be due to the increasing anxiety of women who would give birth at a time when the world is dominated by COVID-19 infection. An unplanned pregnancy may activate the mechanism of guilt due to the spontaneity of pregnancy and decrease sexual function in women. Nevertheless, it must be emphasized that because there are limited normative data on the sexual function of pregnant women, the results of the present study may not be directly comparable with the literature.

The major limitation of the present study was that the participants were recruited from a single antenatal clinic and therefore might not be representative of all pregnant women in the population. Moreover, it was not possible to evaluate the partners' anxieties and views on sexuality or the women's anxieties and views on male sexuality. It must be kept in mind that male sexual dysfunction is among the causes of sexual dysfunction. It was also not possible to perform a test to evaluate stress levels.

The present study demonstrated that the COVID-19 pandemic and the restrictive social distancing measures negatively influenced sexual function in pregnant women who were in the third trimester, university graduates, and multiparous compared with uninfected women of reproductive age. The COVID-19 pandemic is an ongoing

situation and there are no scientific data on how the pandemic will affect the sexual lives of pregnant women in the coming months or years. It is believed that the effects of the COVID-19 pandemic and sexual dysfunction can be prevented using online courses that pregnant women can attend with their partners, which could have positive effects on the psychological and physiological development of pregnant women.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

AUTHOR CONTRIBUTIONS

LAK was responsible for the planning, conducting, interpretation of data, and manuscript writing. AA, HA, and SYS were responsible for data analysis and acquisition. SE was responsible for designing, interpretation of data, and revising the manuscript.

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