Evaluation of Women’s Sexual Functions After COVID-19 Infection

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Abstract

Objectives: Sexual health is an essential component of life quality. In this study, we aim to compare the sexual dysfunction of women who had a history of COVID-19 and those who did not have been infected by COVID-19.

Methods: This study was conducted in a tertiary center between May 2020 and December 2020. Our study group included 50 women treated for COVID-19 at home, and control group included 51 women with no history of COVID-19. Female Sexual Functioning Index (FSFI) was used to assess these patients’ sexual dysfunctions.

Results: Sexual dysfunction in women with a history of COVID-19 was found to be significantly higher than those with no history of COVID-19. Sexual dysfunction development risk in women with a history of COVID-19 (study group) was 3.4 times higher compared to women with no history of COVID-19 (control group) (p=0.008). In addition, high number of children and low economic status were found to be predictive for sexual dysfunction after recovery (p=0.02 and p=0.024, respectively). Arousal, orgasm, satisfaction subscale scores, and total FSFI scores in women with a history of COVID-19 were significantly lower than those with no history of COVID-19 (p=0.011, p=0.002, p=0.028, and p=0.008, respectively).

Conclusion: Sexual dysfunction in the patients with a history of COVID-19 seems to be higher than in women with no history of COVID-19. Increased parity and low economic status are predictive for sexual dysfunction after treatment. There is a need for future studies relating to the effect of the COVID-19 infection in women’s sexual functions.

Keywords: Coronavirus, pandemic, sexual dysfunction, sexual health, women’s health

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men and women during the Covid-19 outbreak. Among women in Turkey, decreased sexual intercourse frequency, sexual abstinence, and increased separated sexual behavior were observed compared to the pre-pandemic period. In the same study, better sexual function scores were reported between couples who spent more time together during the pandemic. Fuchs et al. (2020) have reported similar results among Polish women. The results confirmed that the pandemic affects sexual and reproductive health diversely at personal and social levels. Economic and mental effects may cause important changes in sexual behavior. Even though there is no evidence that COVID-19 is sexually transmitted, suggested social distance and fear may cause avoidance from sexuality. In addition, patients survived COVID-19 and their partners may exhibit avoiding sexuality behavior due to mental reasons. Besides these economic, social, and cognitive reasons, COVID-19 infection's long-term effects on sexual behavior-regulating issues and hormones of the survivors are unknown.

From the early stages of the pandemic, health systems and research focused on mortalities and short-term morbidities. Although there are similar studies about the effects of the pandemic on sexual behaviors of the general community, there is no comparative study about the effects on sexual functions of women survived from COVID-19 and women without COVID-19 history yet. This study aims to compare characteristics of women survived from COVID-19 and women who have not beeninfected by COVID-19 in terms of sexual dysfunction.

Methods

Settings, Participants
This prospective case control study was conducted in a tertiary state hospital between May 2020 and December 2020 to compare the sexual function of women who survived COVID-19 infection without hospitalization and women with no history of COVID-19.

Fifty women previously diagnosed with mild-medium symptoms of COVID-19 infection who had ambulatory care and 51 women with no history of COVID-19 were enrolled. Participants were required to have sexual activity within the past 4 weeks and to be of reproductive age. In addition, study groups were required to complete quarantine at home and have two negative PCR tests. Women with a psychiatric disease or using drugs that might cause sexual dysfunction, malignancy, endometriosis, previous gynecologic surgery, and previous sexual dysfunction diagnosis were excluded from the study.

Data Collection
In obtaining women's sociodemographic data, the study form which included questions generated by researchers was used. The sexual dysfunction was screened using Female Sexual Functioning Index (FSFI). FSFI, a Likert-type scale, includes desire, arousal, lubrication, orgasm, sexual success, and pain sub-scales. Higher scores mean better sexual function. Cutoff value for women with and without sexual dysfunction in total scale was given as 26.55. To prevent false positives, in FSFI-using studies, it is suggested to include women reporting sexual activity within the past 4 weeks.

Procedure
Women were notified of the study verbally and invited to participate. Fifty women with a history of COVID-19 were treated (symptomatic treatment and favipiravir treatment) at home quarantine and two consecutive negative PCR results were included in the study. The study form and FSFI scale were applied to women in a private room reserved for the study. The variable “chronic disease” used in the study refers to any systemic disease (cardiovascular, endocrine, autoimmune, etc.) lasting for more than 6 months. Body mass index (BMI) (BMI), B2 was used to define obesity.

Ethics
Ethics committee approval for the study was obtained from the ethics committee of the hospital, where the study was conducted (Date: 02/06/2020, No: 88). The study was performed in accordance with World Medical Association's Helsinki Declaration (2013, Brazil, Fortaleza). Written and verbal consent were requested from women. Identification data were not recorded in scales and forms, all information was collected anonymously.

Statistical Analysis
Data analysis was performed using SPSS version 21 (IBM corp., Armonk, NY). Data values were stated as mean±SD or number, %. Chi-square test was used for testing the relation between categoric variables. To compare the mean of numerical data between the groups, an independent sample t-test was used for the data with the normal distribution, while Mann–Whitney U-test was used for those with no normal distribution. Binomial logistic regression analysis was performed to evaluate possible variables effect on sexual dysfunction. P<0.05 was accepted as significant statistically.

Results
Fifty women with COVID-19 history and 51 healthy women included in the study. The age, BMI, and parity of all par-
Participants were 38.7±3.8, 26.3±4.5, and 2.4±2, respectively. The findings related to sociodemographic, obstetric, and general health status of the study and control groups were similar (Table 1). There was no difference among groups regarding demographic properties.

Table 2 shows comparisons related to FSFI scores among two groups. Sub-scale scores of the arousal, orgasm, satisfaction, and total scores were significantly lower in the study group than in the control group. According to FSFI cutoff score, the frequency of the sexual dysfunction in the study group (n=30, 63.8%) was significantly higher than the control group (n=17, 36.2%) (p=0.007).

Binomial logistic regression was performed to determine the effects of COVID-19 history, age, the number of children, education, contraception method, sharing same bedroom, economic status, and working status variables on sexual dysfunction in women (χ²(8) = 22.868, p=0.04). The model explained 27.1% of the variance in sexual dysfunction (Nagelkerke R²) and classified 74.3% of cases correctly. Model’s sensitivity was found as 70.2%, specificity 77.8%.

| Table 1. Comparison of the study and control groups’ sociodemographic findings |
|------------------------------------------|-------------------|-------------------|---|
|                                | Control group (n=51) Mean±SD/n (%) | Study group (n=50) Mean±SD/n (%) | p  |
| Age                        | 38.5±3.9          | 39±3.8            | 0.5⁺ |
| BMI                       | 25.6±3.8          | 27±5              | 0.1⁺ |
| Duration of time for marriage (years) | 14.4±7.2          | 13.5±8            | 0.54⁺ |
| Number of pregnancies | 2.3±1.6           | 2.5±2.4           | 0.54⁺ |
| Number of live births    | 1.1±1.1           | 1.56±1.4          | 0.09⁺ |
| Number of in-utero mort fetus | 0.019±0.14        | 0.06±0.4          | 0.52⁺ |
| Spontaneous abortus      | 0.39±0.85         | 0.46±1.5          | 0.78⁺ |
| Number of children       | 1.64±0.91         | 1.7±1.2           | 0.74⁺ |
| Menarche                 | 13.1±1.4          | 13.2±1.46         | 0.61⁺ |
| Smoker (n, %)            | 21 (55.3)         | 17 (44.7)         | 0.46⁺ |
| Education                |                   |                   |    |
| Preliminary-secondary    | 34 (68)           | 33 (64.7)         | 0.73⁺ |
| Higher Education         | 16 (32)           | 18 (35.3)         |    |
| Employment (n, %)        | 33 (64.7)         | 24 (48)           | 0.09⁺ |
| Economic status          |                   |                   |    |
| Poor                     | 7 (13.7)          | 10 (20)           | 0.39⁺ |
| Medium-Good              | 44 (86.3)         | 40 (80)           |    |
| Non-family members living at home | 45 (88.2)     | 37 (74)           | 0.07⁺ |
| Primary cesarean section* | 20 (44.4)         | 17 (41.5)         | 0.78⁺ |
| History of episiotomy*   | 4 (16)            | 2 (8.7)           | 0.67⁺ |
| Contraception            | 45 (88.2)         | 40 (80)           | 0.26⁺ |
| Couples sharing same bedroom | 46 (92)           | 49 (96.1)         | 0.44⁺ |
| Drug usage               | 14 (27.5)         | 11 (22)           | 0.53⁺ |
| Chronic disease          | 16 (39.3)         | 11 (40.7)         | 0.29⁺ |
| Status of relation with spouse** |                   |                   |    |
| Good                     | 36 (55.4)         | 29 (44.6)         | 0.33⁺ |
| Medium                   | 11 (45.8)         | 13 (54.2)         |    |
| Poor                     | 4 (33.3)          | 8 (66.7)          |    |

⁺In women previously gave birth; **According to women’s own perception; BMI: Body mass index; ⁺Independent t-test; ⁺Pearson chi-square were used.
Therefore, women survived from COVID-19 compared to the general population. Mental health problems were significantly higher for the patients who survived from COVID-19, any diagnosis of psychiatric disease incidence in 14–90 days after COVID-19 infection was reported as 18.1%. This frequency is higher than estimated frequencies for influenza, other respiratory tract infections, skin infections, cholelithiasis, and urolithiasis.

About 40% of the patients who survived from Middle East Respiratory Distress Syndrome have shown the post-traumatic stress disorder after 3 years. A study evaluating 62,354 patients who survived from COVID-19, any diagnosis of psychiatric disease incidence in 14–90 days after COVID-19 infection was reported as 18.1%. This frequency is higher than estimated frequencies for influenza, other respiratory tract infections, skin infections, cholelithiasis, and urolithiasis.

Sexual dysfunction may be caused by biological or organic, psychological, and social conditions. For women with COVID-19 history, one or more of these mechanisms may have a role in sexual dysfunction. It is known that stress and anxiety disorders may continue in patients even after recovery. About 40% of the patients who survived from Middle East Respiratory Distress Syndrome have shown the post-traumatic stress disorder after 3 years. In a study evaluating 62,354 patients who survived from COVID-19, any diagnosis of psychiatric disease incidence in 14–90 days after COVID-19 infection was reported as 18.1%. This frequency is higher than estimated frequencies for influenza, other respiratory tract infections, skin infections, cholelithiasis, and urolithiasis.

In one of the early studies in China, it was reported that mental health problems were significantly higher for the patients survived from COVID-19 compared to the general population of Hubei state in the 5th month of recovery. Female gender, living alone, accompanying chronic diseases, low educational status, and lower income were indicated as risk factors for serious mental disorders. Therefore, women survived from COVID-19 are potentially at risk of mental disorder, and this may cause an increase in the frequency of sexual dysfunction. In addition, antidepressant drugs used in case of mental or psychiatric disorders also may cause difficulties in sexual desire, arousal, and orgasm.

| Table 3. Binomial logistic regression model related to sexual dysfunction in women during the COVID-19 pandemic period |
|-----------------------------|-----|--------|-------------|
| B              | Sig | Exp (B) | 95% CI for EXP(B) |
| Covid-19       | 1.237 | 0.008 | 3.44 | 1.37 | 8.64 |
| Number of children | 0.573 | 0.02 | 1.77 | 1.09 | 2.87 |
| Age            | 0.020 | 0.77 | 1.02 | 0.89 | 1.17 |
| Education      | 0.246 | 0.65 | 1.28 | 0.45 | 3.65 |
| Contraception  | 0.714 | 0.34 | 2.04 | 0.47 | 8.92 |
| Sharing same bedroom | 1.464 | 0.18 | 4.32 | 0.51 | 36.64 |
| Economic status | −1.270 | 0.02 | 0.28 | 0.09 | 0.84 |
| Employment     | 0.417 | 0.40 | 1.52 | 0.57 | 4.05 |
| Constant       | −2.675 | 0.35 | 0.07 |

COVID-19: Women having COVID-19 history compared to those with no COVID-19 history. Education: Women have a preliminary/secondary education level compared to those having higher education level. Economic status: women with poor economic level compared to those with medium-good economic level. Employment: unemployed women compared to employed women.
The stigmatization related to COVID-19 imposes a burden on the mental health of those after recovery. This social boycott, isolation, and stigmatization may increase anxiety, depression, and feeling of loneliness. The stigmatization related to the possible mental disorders in combination with the stigmatization exhibited toward individuals survived from COVID-19 may cause deterioration of health-seeking behaviors and double stigmatization, which, as a result, increased morbidity. Therefore, these can contribute to the high frequency of sexual dysfunction in COVID-19 survivors. Supporting the aforementioned interrelations, in our study, we also found high frequency of sexual dysfunction in COVID-19 survivors.

There is no clear evidence about COVID-19 causing sexual dysfunction through a biological-organic mechanism in women. There is some evidence that COVID-19 may cause testicular involvement and decrease testosterone levels in men. However, there is no similar evidence for gonadal involvement in women. There is no reported data related to the side effects on sexual functions for the ambulatory favipiravir treatment for COVID-19. Another possible mechanism was mentioned in a study, and it was supposed that COVID-19 might cause direct or indirect (spinal cord) gonadal damage through immune complex-mediated vasculitis. Vasculitis-related cardiac and central nervous system dysfunction and the medications used for these morbidities may contribute to sexual dysfunction.

**Conclusion**

The risk of sexual dysfunction in women with COVID-19 history is higher than women with no COVID-19 history, and COVID-19 infection history is predictive for sexual dysfunction in women. Specifically, sexual dysfunction in terms of arousal, orgasm, and satisfaction is significantly worse in women with COVID-19 history. There is a need for investigation regarding the frequency and etiology of sexual dysfunction in women after COVID-19 infection.

**Disclosures**

**Ethics Committee Approval:** Ethics committee approval for the study was obtained from the ethics committee of the hospital, where the study was conducted (Date: 02/06/2020, No: 88). The study was performed in accordance with World Medical Association’s Helsinki Declaration (2013, Brazil, Fortaleza).

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**Conflict of Interest:** None declared.

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