

Original Article

Effect of Covid-2019 Infection on Main Sexual Function Domains in Iranian Patients

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HIGHLIGHTS

- The sexual desire and sexual function scores significantly decreased in affected patients by Covid-2019 infection compared to the pre-covid period in males and females.
- The mean score of sexual desire was lower in men affected with Covid-2019 infection compared to the females.
- Patients with more severe disease and a history of ICU admission had a more severe decrease in sexual function scores compared to the outpatient setting.

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ABSTRACT

Introduction

The main purpose of this study was to investigate the relationship between Covid-2019 and sexual dysfunction.

Methods

A cross-sectional study included the affected coronavirus disease 2019 patients in outpatient and inpatient settings between July 2020 and December 2020. This study was used the International Index of Erectile Function (IIEF-5) and Female Sexual Function Index (FSFI) questionnaires to evaluate sexual function. Two different questionnaires were used for men(15 questions) and women(19 questions). Two similar forms were given to the affected patients; the first questionnaire related the sexual function status before the pandemic, and the second related to the sexual function changes after the Covid-2019 infection(at least one month after covid infection recovery).

Results

The sexual desire significantly decreased in males (change from 12.58 ± 2.15 to 10.75 ± 2.81 ; P-value<0.001) and females (change from 14.75 ± 3.01 to 12.67 ± 3.62 ; P-value<0.001) patients after the Covid-2019 infection compared to the pre-covid period, respectively. The sexual function also significantly decreased in affected patients by Covid-2019 infection in males (from 63.91 ± 10.22 to 54.06 ± 12.43 ; P-value<0.001) and females (from 77.4 ± 15.09 to 61.54 ± 16.18 ; P-value<0.001) patients after the Covid-2019 infection compared to the pre-covid period, respectively. Also, the mean score of sexual desire was lower in men, which means the decrease in sexual desires was more severe in men than women. Patients with more severe disease and a history of intensive care unit (ICU) admission had a more severe decrease in sexual function scores compared to the outpatient setting.

Conclusions

The sexual desire and sexual function scores significantly decreased in affected patients by Covid-2019 infection compared to the pre-covid period in males and females. The mean score of sexual desire was lower in men affected with Covid-2019 infection compared to the females. Patients with more severe disease and a history of ICU admission had a more severe decrease in sexual function scores compared to the outpatient setting.

Keywords: Covid-2019 Infection, Sexual Desire, Sexual Function, Sexual Satisfaction

Introduction

Since the coronavirus disease 2019 in December 2019, the world has been confronted with various aspects of the disease, besides the pulmonary involvement, that could affect the other parts of our life, including social, economic, educational, interpersonal relationship, and psychological problems in affected people. According to World Health Organization, sexual health is a state of physical, mental, and social well-being related to sexuality; sexuality is influenced by biological, psychological, social, economic, political, cultural, legal, historical interaction, religious, and religious-spiritual factors (1). Moreover, these situations were more complicated due to the quarantine laws and segregation. There are contradictory studies regarding the effect of the Covid-2019 pandemic on sexual life. Most studies mentioned the negative effect of pandemics mainly due to the fear of contamination to the virus after sexual contact. Some studies showed increased sexual function during the pandemic due to couples' more free time at home.

Conversely, some studies showed that the children's educational program shifted from school to home could result in inhibitory factors for couples to have a convenient atmosphere to do the sexual behaviors. The psychological effect of the pandemic related to the social distancing between family members, anxiety, and depression, could be exacerbated by the economic issues, including loss of jobs. These factors also could influence sexual behaviors. This study investigates the different sexual functions domains among patients affected by coronavirus 2019 in our referral center.

Methods

This cross-sectional study included the affected coronavirus disease 2019 patients from our center between July 2020 and December 2020. The Iranian Artesh University Medical Sciences Ethics Committee approved this study (IR.AJAUMS.REC.1400,033). The included patients were 20-60 years old sexually active cases referred to our center with a coronavirus disease 2019 (outpatient, inpatient) diagnosis and treated uneventfully. All diagnoses of the Covid-2019 infection were confirmed by PCR test. This survey was voluntary, and survey responders were anonymous. This study was used the IIEF-5 and FSFI questionnaires to evaluate sexual function. Two different questionnaires were used for men (15 questions) and women (19 questions). Each question had six options, which were given zero to five points, respectively). Moreover, it evaluated the primary domain of the sexual function (supplementary forms 1 and 2). Two similar forms were given to the affected patients; the first questionnaire related the sexual function status before the pandemic, and the second related to the sexual function changes after the Covid-2019 infection (at least one month after covid infection recovery). The exclusion

criteria were previous history of sexual dysfunction, depression, substance abuse, alcohol consumption, pregnancy, nursing mothers, and any disease that affected the sexual function, such as diabetes mellitus, hypertension, and hormonal disorders.

Statistical analysis was performed using SPSS software version 26. Quantitative variables were described using mean and deviation Standard and qualitative data using frequency and frequency percentages with appropriate tables and graphs. The Wilcoxon test, Mann-Whitney, and Kruskal-Wallis test were also used to analyze the data. The P-value<0.05 was considered significant.

Results

A total number of 120 patients were included in our study. The sex distribution was sixty-five male (54.2 %) patients, and fifty-five female (45.8%). The age range in males was 21-56 years (Mean±SD:37.82±9.8) and 22-58 years (Mean±SD39.85±10.41). Among them, 82,28, and 10 patients managed in outpatient, inpatient, and ICU settings during the affecting with Coronavirus infection 2019, respectively.

The change in sexual desire and main domain of sexual function according to the IIEF-5 questionnaire is depicted in Table 1. The sexual desire significantly decreased in males (change from 12.58±2.15 to 10.75 ±2.81; P-value<0.001) and females (change from 14.75±3.01 to 12.67±3.62; P-value<0.001) patients after the Covid-2019 infection compared to the pre-covid period, respectively. The sexual function also significantly decreased in affected patients by Covid-2019 infection in males (from 63.91±10.22 to 54.06±12.43; P-value<0.001) and females (from 77.4±15.09 to 61.54±16.18; P-value<0.001). Patients after the Covid-2019 infection compared to the pre-covid period, respectively. Also, the mean score of sexual desire was lower in men, which means the decrease in sexual desires was more severe in men than women.

The other investigated domains included sexual satisfaction in both sex, erectile function in men, and the lubrication status during sexual intercourse in women. These findings are depicted in Table 2. The mean score of sexual satisfaction was lower after Covid-2019 infection compared to the pre-Covid period (P-value<0.001) in both sexes. The mean erectile score was lower after Covid-2019 infection in males compared to the pre-covid (18.63 versus 21.15; P-value<0.001). Also, the mean score of the lubrication was lower after COVID-2019 infection in females than in the pre-covid period (61.54 versus 71.04; P-value<0.001).

Finally, we investigated differences between outpatient and inpatient settings regarding sexual desire and sexual function changes before and after infection with Covid-2019 (Table 3). The results showed that ICU admitted patients had a lower sexual desire and function

Table 1. Comparison of sexual desire and sexual function in men and women before and after COVID

	Variable	Time	Mean	SD	Median	Interquartile range (IQR)	Z score	P-Value
Men	Sexual desire	Before COVID-19	12.58	2.157	13	3	4.950	<0.001
		After COVID-19	10.75	2.818	11	3		
	Sexual function	Before COVID-19	63.91	10.221	65.50	7	5.755	<0.001
		After COVID-19	56.06	12.438	57.50	15		
Women	Sexual desire	Before COVID-19	14.57	3.019	15	4	5.166	<0.001
		After COVID-19	12.67	3.624	12.50	6		
	Sexual function	Before COVID-19	71.04	11.599	71.50	14	5.193	<0.001
		After COVID-19	61.54	16.186	61.50	24		

Table 2. The correlation of sexual satisfaction in men and women before and after COVID-19

	Variable	Time	Mean	SD	Median	Interquartile range (IQR)	Z score	P-Value
Men	Sexual satisfaction	Before COVID-19	21.62	3.852	22	4	5.423	<0.001
		After COVID-19	19.05	4.463	20	5		
	Erection	Before COVID-19	21.15	3.809	21.50	4	5.399	<0.001
		After COVID-19	18.63	4.540	19	5		
Women	Sexual satisfaction	Before COVID-19	14.09	2.824	14.50	4	4.483	<0.001
		After COVID-19	12.20	3.724	12	7		
	Lubrication	Before COVID-19	71.04	3.137	16	6	4.265	<0.001
		After COVID-19	61.54	4.219	14.50	6		

score than the inpatient ward admitted and outpatient setting (P-value<0.02 and P-value<0.001, respectively).

Discussion

A coronavirus infection disease (Covid-2019) was recognized as a pandemic in late 2020 (2). Besides the pulmonary system involvement, it had several impacts on lifestyle, socioeconomic territories, and global health, but contradictory studies exist regarding its impact on sexual health (3-6). The main focus of most studies that investigated the effect of Covid-2019 infection on sexual health is in two domains: sexual desire and sexual function (7). Due to the impact of sexual activity on mental and psychological health, it is a merit to get special notice. The fear of the virus transmission during sexual intercourse, lockdown, and social distancing may indirectly influence sexual activity during the pandemic (8).

In a study by Mollaioli et al., they investigated the role of sexual activity in decreasing anxiety and depression during the pandemic. They concluded that lack of sexual activity was accompanied by a meaningfully higher

risk of emerging anxiety and depression (OR: 1.32;95% CI: 1.12 - 1.57, P-value<0.001 and 1.34;95% CI: 1.15 - 1.57, P-value<0.001, respectively) (9). Ballester et al., evaluated the lockdown effect on different domains of sexual life in 1448 Spanish people. They concluded that the social restriction had affected the sexual life of half of the Spanish population (47.7%), especially women (10). Our results revealed that the decrease in sexual desires was more severe in men than women. In a study by Amar et al., they evaluated the effect of social restriction on sexual pleasure and satisfaction among a total of 479 females and 217 males. Sexual satisfaction was meaningfully higher before (91.2%,73.5%) than during pandemic (70.5%, 56.2%) in both males and females, respectively. Females had a more anxiety and depression score than males and consequently sexual dissatisfaction (11). Fuchs et al., evaluated the effect of the pandemic on sexual function score among 764 female patients before and during the social confinement. The FSFI was used to evaluate the changes. Before the pandemic, the overall sexual function score was 30.1±4.4 and changed to 25.8±9.7 during it. All

Table 3. The correlation of Sexuality, Sexual function in three different hospital wards

Variable	Time	Mean Rank	Statistical value K.W	Degree of freedom d.f	P-Value
Sexuality	Outpatient	66.13	7.87	2	<0.02
	Hospitalized	51.46			
	ICU	39.65			
Sexual function	Outpatient	67.80	17.87	2	<0.001
	Hospitalized	50.79			
	ICU	22.65			

sexual domains Scores decreased as well (P-value<0.001) (12). Bhambhani et al., evaluated Ninety-one women regarding sexual dysfunction during the pandemic. The Overall sexual function scores significantly decreased during the pandemic (27.2 vs. 28.8, P-value=0.002) (13). A study by Schiavi et al. evaluated 89 female patients regarding the sexual function changes during the lockdown using the FSFI questionnaire. The sexual function scores decreased meaningfully (29.2 ± 4.2 vs. 19.2 ± 3.3 , mean difference: -9.7 ± 2.6). Interestingly, working outside the home, university educational level, and parity ≥ 1 are predictive of lower sexual function scores (14).

Bulut et al., investigated sexual function changes during pandemics among healthcare professionals. They studied 159 male healthcare professionals working in COVID-19 units and a control group of 200 people. The results showed that erectile dysfunction and post-traumatic stress disorders were more frequent in the healthcare professionals group (P-value<0.001) (15). In an exciting study by Mirzaie et al., they evaluated the pandemic's effect on the sexual function of pregnant and lactating women. The results showed that the sexual function scores were lower in pregnant, lactating women than non-pregnant / non-lactating women (P-value<0.001) (16).

Fang et al., evaluated the effect of the pandemic on erectile function or ejaculatory control ability among 612 adult males during the survey. About 8.4% and 8.5% persons stated worsened erectile function or ejaculation control ability by self-evaluation, whereas 31.9% and 17.9% of subjects showed decreased IIEF-5 scores or increased premature ejaculation scores (17). One of the particular aspects of our study was that we investigated the incidence of sexual problems in outpatient, inpatient settings (18). The prevalence of these problems was directly related to the severity of the disease, so the ICU admitted patients had more decrease in the sexual function scores. In a study by Duran et al., they studied the incidence of erectile dysfunction during the pandemic compared to the pre-Covid period in 4,955 male patients referred to the urology clinic. The erectile dysfunction was significantly prevalent during the pandemic compared to the pre-Covid

period (8.7% vs. 6.6% P-value=0.008) (19). De Rose et al., evaluated the impact of the pandemic on sexual health among 245 participants (148 men and 97 women). They used IIEF-15 and Female Sexual Function Index (FSFI) to assess the sexual function domains. Through pandemic, sexual intercourse decreased significantly in men (P-value=0.001) and women (P-value=0.001) compared to the pre-Covid period (20). Most studies investigated the impact of the pandemic on sexual behaviors especially decreased sexual desire and lower frequency of sexual intercourse. However, one of the unique aspects of our study is the investigation of the sexual function domains, such as erectile dysfunction, lubrication status in women, and sexual satisfaction among affected patients with Covid-2019 infection. Our results disclosed the sexual desire and main domains of sexual function affected by Covid-2019 infection. We supposed that patients with a history of ICU had severe disease and an outpatient setting as a mild to moderate disease. A more severe case with a history of ICU admission had a more severe decrease in sexual function scores compared to the outpatient setting. The influencing causes for sexual dysfunction are unknown in patients with Covid-2019 infection; future studies are justified to explore the risk factors for sexual problems in this population.

Conclusions

The sexual desire and sexual function scores significantly decreased in affected patients by Covid-2019 infection compared to the pre-covid period in males and females. The mean score of sexual desire was lower in men affected with Covid-2019 infection compared to the females. Patients with more severe disease and a history of ICU admission had a more severe decrease in sexual function scores compared to the outpatient setting.

Authors' contributions

All authors contributed equally.

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Conflict of interest

All authors declare that there is no conflict of interest.

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Ethics statement

The Iranian Artesh University Medical Sciences Ethics Committee approved this study (IR.AJAUMS.REC.1400,033).

Data availability

Data will be provided on request.

Abbreviations

ICU	Intensive care unit
IIEF-5	International index of erectile function
FSFI	Female sexual function index

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