



# Changes in sexual functions and habits of healthcare workers during the ongoing COVID-19 outbreak: a cross-sectional survey study

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Received: 8 May 2021 / Accepted: 10 June 2021 / Published online: 30 June 2021  
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## Abstract

**Background** The negative psychosocial effects of the ongoing COVID-19 pandemic on healthcare workers are increasing worldwide.

**Aim** The aim of this study is to investigate the impact of healthcare workers' long-term exposure to the COVID-19 outbreak on their sexual habits and functions.

**Methods** A total of 263 healthcare workers completed this online questionnaire between 1 December 2020 and 31 January 2021. After the informed consent of the participants, the first part of the three-part survey included demographic data, COVID-19 disease status and sexual habits before and after COVID-19, sexual function and anxiety status assessment in the second and last part.

**Results** A total of 240 participants were included in the study. Of the participants, 124 were men, 116 were women. The mean age of the participants was  $40.18 \pm 7$ . Compared to pre-pandemic period, health workers' sexual desire level ( $p=0.000$ ), weekly sexual intercourse frequency ( $p=0.001$ ), foreplay duration ( $p=0.000$ ), and coitus duration ( $p=0.009$ ) decreased during the ongoing pandemic period. When the factors affecting sexual dysfunction were evaluated with multivariate logistic regression analysis, it was determined that female gender (OR 0.312), high anxiety score (OR 0.949), and decreased quality social time spent with spouse or partner were risk factors for sexual dysfunction (OR 0.358).

**Conclusion** Psychological support provided to healthcare workers during the ongoing pandemic period will improve their sexual habits and functions negatively affected by the COVID-19 outbreak, as well as their social life with their spouses or partners.

**Keywords** COVID-19 · Healthcare workers · Pandemic · Sexual dysfunction

## Introduction

The agent that caused severe acute respiratory syndrome, first reported in Wuhan province of China in December 2019 and revealed to be a virus from the coronavirus family in January 2020, was named SARS-CoV-2 [1]. This new coronavirus has spread rapidly and caused deaths all over the world. Therefore, in early March 2020, the 2019

coronavirus disease (COVID-19) was declared by the World Health Organization as a pandemic [2]. It continues to be a major health problem ever since. COVID-19 is a respiratory virus whose primary target is the lungs, which is transmitted by direct contact and inhalation of large respiratory droplets of infected persons [3]. Despite many vaccine and drug studies, there is still no specific agent with high antiviral activity against the virus [4]. Therefore, the global pandemic is tried to be controlled by the using of masks in public areas, paying attention to personal hygiene practices, following social distance rules and ensuring the isolation of sick individuals worldwide [5]. In addition, restrictions of international travel and trade between countries, education and training activities, and limitation of working hours have been implemented, curfews have been imposed, especially in many countries where COVID-19 is common [6].

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All these practices and especially social isolation have led to the emergence of a new unusual lifestyle and also affected the quality of everyone's life. Social isolation brings along emotions such as anxiety and panic as well as widespread fear, which can lead to situations that negatively affect the quality of life, including depression and sexual dysfunction [7]. Therefore, social restrictions taken as a precaution against COVID-19 will change individuals' social relationships and sexual life, and attitudes. There is not enough evidence yet that it is sexually transmitted [8]. However, the fact that close contact of partners during sexual intercourse may cause the virus to pass between partners can negatively affect sexual habits. Healthcare professionals around the world have to work in departments related to COVID-19 regardless of their expertise due to the density of COVID-19 patients and the shortage of healthcare professionals [9]. For this reason, healthcare workers are the individuals who are most in contact with the virus in this pandemic. In addition to the anxiety and fear caused by the high exposure of healthcare professionals to the virus, the worry of transmitting the virus they receive from the hospital to their partners can affect their sexual attitudes.

There are few studies in the literature that investigate the sexual health status of healthcare workers during the COVID-19 outbreak and evaluate the impact of the COVID-19 outbreak on male and female sexual behavior [6, 7, 10, 11]. However, these studies were conducted in the beginning period of the pandemic in our country. There are no studies evaluating the sexual life and behavior of healthcare workers who have been exposed to COVID-19 and social restrictions for a long time.

The main objective of this study is to investigate the impact of healthcare workers' long-term exposure to the COVID-19 outbreak on their sexual habits and functions. In addition, another aim of the study is to determine the factors affecting sexual dysfunction during the ongoing pandemic and to examine whether the anxiety that may be caused by this exposure in healthcare workers affects sexual functions or not.

## Material and methods

This cross-sectional and descriptive online survey study evaluated whether there was a change in the sexual functions and behaviors of healthcare workers during the ongoing COVID-19 outbreak in our country.

The study was conducted with the local ethics committee approval under the Institutional Review Board (IRB) number 2020/178. Informed consent was obtained from all participants included in the study. This study was performed in line with the principles of the Declaration of Helsinki.

After obtaining the consent of the healthcare workers and the hospital management, healthcare workers were accessed from the hospital database and the online questionnaire was sent from the health institutions' social media accounts (WhatsApp®, etc.) and e-mail addresses. The survey was conducted online so that the participants could share their sexual life answers and other information without shame and planned in such a way that the identity information of the individuals would not be questioned. In the first part of the four-part survey, the participants were informed about the research. It was clearly stated on the permission screen that personal data would be kept confidential and not shared with third parties. At the end of this section, there was an option to accept or refuse to participate in the survey. In the second part of the survey, the sociodemographic characteristics of the participants, the presence of chronic or psychological disorders, COVID-19 disease status, and sexual life attitudes before and after the COVID-19 pandemic (sexual intercourse frequency, sexual desire status, duration of sexual intercourse, foreplay duration, number of masturbation) were questioned. In the last two parts, the sexual functions and anxiety levels of the participants were questioned by using verified questionnaires.

The 19-question Female Sexual Function Index (FSFI), which was validated in Turkish in 2005, was used to evaluate female participants' sexual function. FSFI is a Likert-type scale that presents sexual dysfunction in women under six sub-headings: desire, arousal, lubrication, orgasm, satisfaction, and pain [12, 13]. A maximum of 36 points can be obtained from the questionnaire and scores below 26.55 indicate sexual dysfunction [12].

The International Index of Erectile Function (IIEF), which was validated in Turkish in 2002, was used to assess the sexual function status of male participants [14]. The IIEF is a 15-question questionnaire that questions the sexual function status in men, consisting of subgroups of erectile function, orgasm function, sexual desire, sexual satisfaction, and general satisfaction [14, 15]. A total score below 25 under the erectile function subsection is defined as erectile dysfunction [15].

The participants' sexual desire levels were assessed by asking the 11th and 12th questions of the IIEF and the 1st and 2nd questions of the FSFI.

The Beck anxiety inventory, which was validated in Turkish, was used to assess the degree of anxiety [16, 17]. A score between 0 and 63 is obtained in the questionnaire consisting of 21 questions. The survey was organized to be completed after the participant registered her e-mail address in the system and answered the mandatory questions.

The survey was sent to 290 healthcare workers who met the inclusion criteria, and they were asked to complete the questionnaire between 1 December 2020 and 31 January 2021. The participants who declared that they did not have

sexual activity, those with a history of radical pelvic surgery or pelvic radiotherapy, those having psychiatric disease, and unrealistic inconsistent responders were excluded from the study (Fig. 1).

## Statistical analysis

All data were statistically analyzed using SPSS 21.0 (IBM, NY, USA) program. Kolmogorov–Smirnov and Shapiro–Wilk tests were used to evaluate the distribution normality of the data. The mean and standard deviation values and percentages of the data with normal distribution were determined. To evaluate changes before and after COVID-19, Wilcoxon test, Mann–Whitney *U* test, chi-square test, and Mc Nemar–Bowker test were used. Multivariate logistic regression analysis was performed to determine the factors affecting sexual dysfunction. Statistical significance was considered as  $p < 0.05$ .

## Results

A total of 240 participants were included in the study. The rate of answering the questionnaire is 90.7%. The mean age of the study population was  $40.18 \pm 7$  (23–60) years, and the mean ages of the female and male participants were  $39.58 \pm 0.61$  (23–54) and  $40.74 \pm 0.65$  (26–60) years, respectively. Of the participants, 116 (48.3%) were female and 124 (51.7%) were male. The mean BMI was  $25.11 \pm 3.42$  (17.3–35.2). The mean age of the spouse or sexual partner of the participants was  $39.87 \pm 7.51$  (23–66). Thirty-five (14.6%) of the participating healthcare workers received psychiatric support during the pandemic, and a total of 35

(14.6%) participants also had COVID-19. The sociodemographic characteristics of the participants are shown in Table 1.

Compared to the pre-pandemic period, health workers' sexual desire level ( $p = 0.000$ ), weekly sexual intercourse frequency ( $p = 0.001$ ), foreplay duration ( $p = 0.000$ ), and coitus duration ( $p = 0.009$ ) decreased during the pandemic period. However, there was no significant difference between the pre-pandemic period and the pandemic period in terms of weekly masturbation frequency ( $p = 0.120$ ) (Table 2).

The percentage of healthcare workers who reported having family members with high mortality risk for COVID-19 was 60.8% (Fig. 2a). In addition, 24.2% of the participants had COVID-19 (+) relatives (Fig. 2b). During the pandemic, the rate of those participating in the study who stated that there was a decrease in the sexual intercourse frequency and sexual desire was 37.1% and 30.8%, respectively (Fig. 2c, d). More than half of the survey participants (52.9%) answered as “decreased” to the question “Has there been any change in quality time spent with spouse or partner during the pandemic?” (Fig. 2e).

The mean sexual function (FSFI, IIEF) and Beck Anxiety Inventory scores of the participants are summarized in Table 3.

Sexual dysfunction was detected in a total of 124 healthcare workers (cutoff value for sexual dysfunction, female 26.55, male 24). Sexual dysfunction was higher in female healthcare workers ( $p = 0.000$ ). Sexual dysfunction was more common in the 18–30 age range and the 46–60 age range ( $p = 0.026$ ), as well as in the healthcare workers with high school and university degrees ( $p = 0.000$ ). Sexual dysfunction was less in doctors and dentists than in other healthcare professionals ( $p = 0.002$ ). Sexual dysfunction was higher in the participants who stated that sexual desire, frequency of sexual intercourse, and quality time spent with spouse or partner decreased ( $p = 0.000$ ,  $p = 0.000$ ,  $p = 0.001$ , respectively) (Table 4).

When the factors affecting sexual dysfunction were evaluated with multivariate logistic regression analysis, it was determined that the female gender is a risk factor for sexual dysfunction (OR 0.312). In addition, it was found that sexual dysfunction was significantly more common in those with high anxiety scores (OR 0.949) and those who stated that the quality social time spent with their spouse or partner decreased (OR 0.358) (Table 5).

## Discussion

Measures and social restrictions, taken worldwide to combat the COVID-19 pandemic, as well as intensive working conditions and high COVID-19 exposure increase the anxiety and stress levels of health workers, and negatively

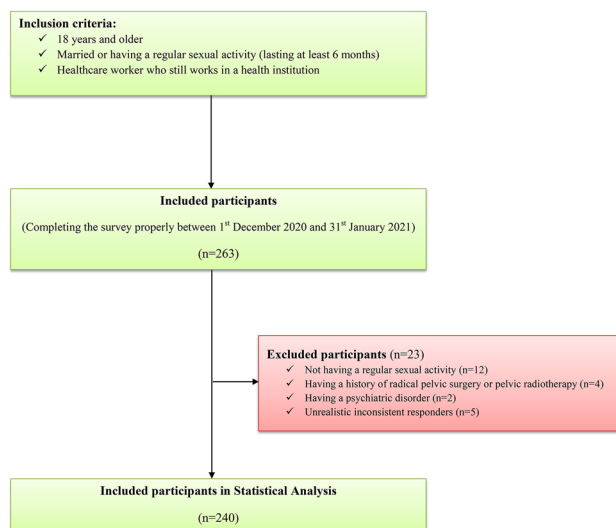


Fig. 1 Flowchart of the study

**Table 1** Demographic characteristics of the participants

	<i>n</i> = 240
Age (mean ± SD)	40.18 ± 7
Gender, <i>n</i> (%)	
Female	116 (48.3)
Male	124 (51.7)
Weight (kg) (mean ± SD)	73.19 ± 13.97
Height (cm) (mean ± SD)	170.15 ± 8.80
BMI (kg/m <sup>2</sup> ) (mean ± SD)	25.11 ± 3.42
Marital status, <i>n</i> (%)	
Single	25 (10.4)
Married	190 (79.2)
Widowed/divorced	25 (10.4)
Number of children, <i>n</i> (%)	
None	44 (18.3)
1	77 (32.1)
2	105 (43.8)
3	13 (5.4)
4	1 (0.4)
Number of people living together, <i>n</i> (%)	
Single	28 (11.7)
2	29 (12.1)
3	61 (25.4)
4	102 (42.5)
≥ 5	20 (8.3)
Education status, <i>n</i> (%)	
High school	13 (5.4)
University	126 (52.5)
Master	36 (15)
Doctorate	65 (27.1)
Occupation, <i>n</i> (%)	
Doctor	95 (39.6)
Dentist	18 (7.5)
Nurse, midwife, health officer	78 (32.5)
Anesthesia technician	13 (5.4)
Medical secretary	20 (8.3)
Others	16 (6.7)
Working time in the occupation, <i>n</i> (%)	
< 5 years	14 (5.8)
5–10 years	31 (12.9)
> 10 years	195 (81.3)
Psychiatric support status during the pandemic period, <i>n</i> (%)	
Yes	35 (14.6)
No	205 (85.4)
Chronic disease status, <i>n</i> (%)	
None	179 (74.6)
Hypertension	20 (8.3)
Diabetes mellitus	7 (2.9)
Chronic pulmonary disease	5 (2.1)
Cardiac disease	4 (1.7)
Hashimoto's thyroiditis	11 (4.6)
Hypercholesterolemia	4 (1.7)
Rheumatologic disease	5 (2.1)
Other	5 (2.1)
COVID-19 (+), <i>n</i> (%)	
Yes	35 (14.6)
No	205 (85.4)
Have any of your relatives been diagnosed with COVID-19?, <i>n</i> (%)	

**Table 1** (continued)

	<i>n</i> = 240
Yes	58 (24.2)
No	182 (75.8)
Does anyone in your family have a high mortality risk for COVID-19?, <i>n</i> (%)	
Yes	146 (60.8)
No	94 (39.2)
Department of COVID-19, <i>n</i> (%)	
None	92 (38.3)
Outpatient clinic	71 (29.6)
Inpatient clinic	28 (11.7)
Intensive care unit	24 (10.0)
Multiple departments	25 (10.4)
Smoking status, <i>n</i> (%)	
Yes	102 (42.5)
No	138 (57.5)
Alcohol status, <i>n</i> (%)	
Yes	124 (51.7)
No	116 (48.3)
Spouse or sexual partner age (mean ± SD)	39.87 ± 7.51

*SD* standard deviation, *BMI* body mass index, *n* number

affect sexual function and quality of life [7, 10]. There is a paucity of literature regarding changes in sexual behavior during lockdown states as seen during the prolonged pandemic. In this survey study, the effect of the prolonged

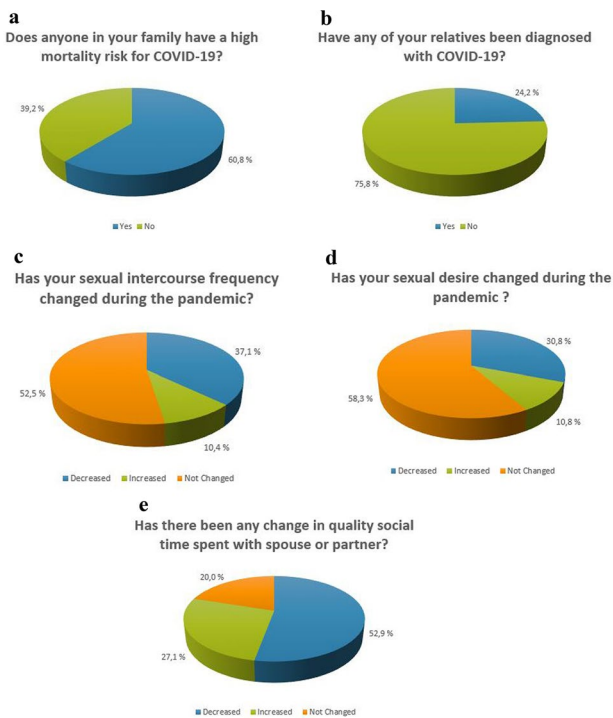
pandemic process on the sexual behavior and sexual function of healthcare workers was examined. Participants’ sexual desire, sexual intercourse frequency, foreplay duration, and coitus duration decreased during the pandemic. However,

**Table 2** Comparison of the sexual behaviors of the participants before and during the pandemic

	Before pandemic	During pandemic	<i>p</i> value
Sexual desire level (mean ± SD)			
Female	3.69 ± 1.03	3.25 ± 1.23	<i>z</i> = -4.805, <b><i>p</i> = 0.000 (W)</b>
Male	7.94 ± 1.58	7.19 ± 2.03	<i>z</i> = -5.193, <b><i>p</i> = 0.000 (W)</b>
Sexual intercourse frequency (per week), <i>n</i>			
No	10	19	<b><math>\chi^2 = 32.076, df = 12, p = 0.001</math> (Mc-B)</b>
1–2	22	58	
3–4	69	41	
5–6	40	36	
7–10	56	53	
> 10	43	33	
Masturbation frequency (per week), <i>n</i>			
No	173	170	<b><math>\chi^2 = 5.836, df = 3, p = 0.120</math> (Mc-B)</b>
1–3	54	48	
> 3	13	22	
Foreplay duration (min), <i>n</i>			
No	17	34	<b><math>\chi^2 = 43.600, df = 12, p = 0.000</math> (Mc-B)</b>
≤ 5	40	58	
5–10	113	92	
10–15	43	35	
15–20	17	13	
≥ 20	10	8	
Coitus duration (min), <i>n</i>			
≤ 1	9	12	<b><math>\chi^2 = 20.388, df = 8, p = 0.009</math> (Mc-B)</b>
1–2	11	19	
2–5	42	50	
5–10	104	91	
≥ 10	74	68	

Bold entries indicate statistically significant difference

*SD* standard deviation, *n* number, *Mc-B* Mc Nemar–Bowker test statistics, *W* Wilcoxon test statistics



**Fig. 2** COVID-19 status of the participants' relatives, changes in the participants' sexual attitudes, and social behavior during the COVID-19 pandemic. **a** COVID-19 mortality risk status of the participants' relatives. **b** Presence of the relatives diagnosed with COVID-19. **c, d** Changes in the sexual desire and frequency of intercourse during the pandemic period. **e** Changes in the social life of the participants with their partners during the pandemic period

participants who reported reduced quality social time spent with their spouse or partner, participants with high anxiety scores, and female healthcare workers had more common sexual dysfunction.

**Table 3** Mean FSFI, IIEF and BAI scores of the participants

	Mean $\pm$ SD
FSFI-desire	3.24 $\pm$ 1.22
FSFI-arousal	2.93 $\pm$ 1.74
FSFI-lubrication	3.39 $\pm$ 1.84
FSFI-orgasm	3.27 $\pm$ 1.95
FSFI-satisfaction	3.45 $\pm$ 1.95
FSFI-pain	3.94 $\pm$ 2.14
FSFI-total	20.26 $\pm$ 9.86
IIEF-erectile function	24.34 $\pm$ 7.69
IIEF-orgasmic function	8.31 $\pm$ 2.89
IIEF-sexual desire	7.18 $\pm$ 2.02
IIEF-sexual satisfaction	10.25 $\pm$ 3.91
IIEF-overall satisfaction	7.74 $\pm$ 1.97
BAI	13.38 $\pm$ 11.86

SD standard deviation, FSFI Female Sexual Function Index, IIEF International Erectile Function Index, BAI Beck Anxiety Inventory

Previous studies during SARS and COVID-19 outbreaks have shown that healthcare workers perceive and react to outbreaks as a natural disaster or state of war, and therefore their social and mental health deteriorates [18, 19]. In a study that reviewed how previous outbreaks and quarantine processes affected individuals, quarantine measures, it was found to be consistently associated with negative psychosocial outcomes such as depressive symptoms, anxiety, anger, stress, posttraumatic stress disorder, social isolation, and loneliness [20]. A study evaluating the impact of COVID-19 on the psychological state of healthcare workers reported that 29.8% of healthcare workers experienced symptoms of stress, 24.1% of anxiety, and 13.5% of depression [21]. As a result of these psychological effects of the pandemic on healthcare workers, it is seen that the COVID-19 pandemic also affects their sexual functions [7, 10]. The fact that the participants with sexual dysfunction had a high anxiety score and the high anxiety score was one of the factors affecting sexual dysfunction in our study also supported these studies and information. We believe that this may be due to the fact that during the ongoing pandemic period, healthcare workers have higher levels of anxiety, fear, and anger because they are more exposed to the virus in their daily business lives compared to individuals in other line of business.

Although SARS-CoV-2 is detected in the seminal fluids of patients or male individuals who have survived the disease [22], there is no study showing that the virus is found in the vaginal fluid or sexually transmitted. However, close contact, which is the nature of sexual intercourse, increases the risk of transmission of the virus, the main transmission path of which is respiration. Some studies are reporting that the number of sexual intercourse decreased, increased, or did not change during the pandemic [7, 11, 23]. In a study conducted during the early period of the pandemic, it was reported that the sexual desire, foreplay duration, sexual intercourse duration, and the number of sexual intercourse or masturbation decreased in healthcare workers during the pandemic [7]. In our study, we found a significant decrease in sexual desire, the number of sexual intercourse, foreplay duration, and coitus duration in healthcare workers during the prolonged pandemic and quarantine periods in support of this information. However, we found that there was no change in the frequency of masturbation during the pandemic. In our opinion, this is due to the instinct of individuals to protect themselves and their spouse or partners from virus transmission.

In a study that evaluated the anxiety level of nurses during the human avian influenza A (H7N9) outbreak, it was reported that anxiety levels were higher at a young age in relation to knowledge, skills, and professional experience [24]. The negative psychological response to quarantine and restrictions during the pandemic period is more aggravated

**Table 4** Comparison of the participants with and without sexual dysfunction

	Sexual dysfunction ( <i>n</i> = 124)	Normal sexual function ( <i>n</i> = 116)	<i>p</i> value
Gender, <i>n</i>			$\chi^2 = 29.653, df = 1, p = \mathbf{0.000}$ (Chi)
Female	81	35	
Male	43	81	
Age group, <i>n</i>			$\chi^2 = 7.302, df = 2, p = \mathbf{0.026}$ (Chi)
18–30	18	7	
31–45	80	92	
46–60	26	17	
BMI, <i>n</i>			$\chi^2 = 1.293, df = 3, p = 0.731$ (Chi)
Weak	4	2	
Normal	66	57	
Overweight	46	47	
Obese	8	10	
Marital status, <i>n</i>			$\chi^2 = 0.858, df = 2, p = 0.651$ (Chi)
Single	15	10	
Married	97	93	
Widowed/divorced	12	13	
Presence of children, <i>n</i>			$\chi^2 = 0.062, df = 1, p = 0.804$ (Chi)
Yes	100	95	
No	24	21	
Education status, <i>n</i>			$\chi^2 = 18.760, df = 3, p = \mathbf{0.000}$ (Chi)
High school	8	5	
University	80	46	
Master	15	21	
Doctorate	21	44	
Occupation, <i>n</i>			$\chi^2 = 22.730, df = 5, p = \mathbf{0.002}$ (Chi)
Doctor	34	61	
Dentist	7	11	
Nurse, midwife, health officer	51	27	
Anesthesia technician	9	4	
Medical secretary	11	9	
Others	12	4	
Chronic disease status, <i>n</i>			$\chi^2 = 0.543, df = 1, p = 0.461$ (Chi)
None	34	27	
≥ 1	90	89	
COVID-19 (+), <i>n</i>			$\chi^2 = 0.157, df = 1, p = 0.692$ (Chi)
Yes	17	18	
No	107	98	
Quality social time spent with spouse or partner (during pandemic), <i>n</i>			$\chi^2 = 13.402, df = 2, p = \mathbf{0.001}$ (Chi)
Decreased	79	48	
Increased	29	26	
Not changed	16	32	
Sexual intercourse frequency (during pandemic), <i>n</i>			$\chi^2 = 25.872, df = 2, p = \mathbf{0.000}$ (Chi)
Decreased	65	24	
Increased	10	15	
Not changed	49	77	
Desire (during pandemic), <i>n</i>			$\chi^2 = 33.863, df = 2, p = \mathbf{0.000}$ (Chi)
Decreased	59	15	
Increased	11	15	
Not changed	54	86	
BAI (mean ± SD)	17.66 ± 1.14	8.93 ± 0.83	$z = -6.046, p = \mathbf{0.000}$ (Man)
Spouse or sexual partner age (mean ± SD)	39.02 ± 1.04	38.80 ± 0.61	$z = -1.128, p = 0.259$ (Man)

Bold entries indicate statistically significant difference

BMI body mass index, *n* number, BAI Beck Anxiety Inventory, SD standard deviation, Chi Pearson’s chi-square test, Man Mann–Whitney *U* test



**Table 5** Multivariate logistic regression analysis

	Univariate			Multivariate		
	OR	CI 95%	<i>p</i> value	OR	CI 95%	<i>p</i> value
Gender	0.330	0.160–0.683	<b>0.003</b>	0.312	0.171–0.567	<b>0.000</b>
Age	0.972	0.918–1.029	0.326			
BMI	0.975	0.880–1.080	0.626			
Number of children	1.230	0.694–2.180	0.478			
Number of people living together	0.952	0.638–1.421	0.811			
Education status	0.766	0.150–3.918	0.749			
Occupation	0.699	0.299–1.634	0.409			
Smoking status	1.504	0.744–3.041	0.256			
Chronic disease	0.956	0.451–2.029	0.907			
COVID-19 (+)	1.281	0.502–3.273	0.605			
Beck Anxiety Inventory	0.948	0.916–0.982	<b>0.003</b>	0.949	0.919–0.979	<b>0.001</b>
Quality social time spent with spouse/partner	0.322	0.133–0.777	<b>0.012</b>	0.358	0.163–0.786	<b>0.011</b>

Bold entries indicate statistically significant difference

*BMI* body mass index

by conditions such as a low level of education, a higher level of self-assessment knowledge, more anxiety about being infected, and a more risky health status [25]. This information suggests that the reason for the higher prevalence of sexual dysfunction among those aged 18–30 and with a low education level in our study is the higher level of anxiety. However, we think that increased anxiety due to age and comorbidities, which are risk factors for COVID-19 mortality, is a factor such as advanced age for high sexual dysfunction in the 46–60 age group. Bulut et al. reported that there is a higher rate of sexual dysfunction in nurses compared to doctors during the pandemic [10]. In our study, we found similar results, and we consider that the higher rate of sexual dysfunction in auxiliary healthcare personnel may be caused by their frequent contact with patients during the day and not being informed as much as the doctors about the pandemics and their consequences.

Another important result of the study was that the majority of those with sexual dysfunction were women. Culha et al. reported that the male gender is a risk factor in sexual dysfunction in a study they conducted with healthcare workers at the beginning of the pandemic [7]. The fact that all family members are at home due to restrictions and lockdowns during the prolonged pandemic period increases the burden of female healthcare workers in their family lives as well as their work lives. In our opinion, all these negativities cause more psychological problems in female healthcare workers and cause their sexual lives to be affected more widely. In addition, the decrease in quality social time spent with spouse or partner in the vast majority of those with sexual dysfunction indicates that the social life of individuals with sexual dysfunction with their spouses or partners is also negatively affected.

There are some limitations of the study. The main one is that the participants' sexual function and anxiety before the pandemic were not assessed with validated surveys, and the depression status of the participants was not evaluated at all. However, other limitations include not questioning the contraception method of the participants, not questioning the use of visual media to satisfy their sexual desires, verifying repeated entries with the e-mail address declared by the participant, creating a prejudice that the participants will return. Another limitation is that assessment scales such as FSFI, IIEF, and beck anxiety inventory used in the study were self-reported due to the online nature of the study.

## Conclusions

The prolonged quarantine process and high exposure to the virus due to the COVID-19 outbreak increase the anxiety levels of healthcare workers and negatively affect their sexual habits and functions. Sexual dysfunction negatively affects the social life with their spouse or partners, causing healthcare workers to be socially isolated and lonely. For this reason, the intermittent psychological evaluation of healthcare workers during the ongoing pandemic period and the provision of psychological support when necessary will improve their social relationships as well as their sexual functions. Future multicenter studies are needed to evaluate the long-term psychosocial adverse effects of the ongoing worldwide pandemic on healthcare workers and the effect of this condition on their sexual habits.

**Author contribution** AG contributed to study concept and design, data collection and analysis, literature review, manuscript writing and



revision, critical review, supervision. AD contributed to study concept and design, literature review, manuscript writing and revision. All authors approved the final version of the article for submission.

**Data availability** The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Declarations

**Ethics committee approval** Ethics committee approval was obtained from the Adnan Menderes University Non-Interventional Clinical Research Ethics Committee, Turkey (No: 9; November 5, 2020). This study was performed in line with the principles of the Declaration of Helsinki.

**Consent to participate** Informed consent was obtained from all individual participants included in the study.

**Conflicts of interest** The authors declare no competing interests.

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