

EPIDEMIOLOGY

Evaluation of the Sexual Functioning of Individuals Living in Turkey During the COVID-19 Pandemic: An Internet-Based Nationwide Survey Study



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ABSTRACT

Introduction: Although many countries in the world prioritize self-isolation measures during the corona virus disease 2019 (COVID-19) pandemic period, the effects of this process on sexual functioning are not yet known.

Aim: To evaluate the effects of the COVID-19 pandemic on the sexual functioning of individuals who declared no medical history of the COVID-19 disease.

Methods: A total of 1,356 participants filled out an Internet-based survey between June 1 and June 20, 2020. The data from these participants were analyzed to determine sexual functioning in terms of sexual intercourse frequency and sexual desire during the COVID-19 pandemic. Subgroups analyses were also performed, wherein the subgroups were developed according to the population density of the cities in which the participants lived to examine whether population density has any effect on the sexual functions of the participants during the COVID-19 pandemic.

Main Outcome Measure: The study outcomes were obtained using a study-specific questionnaire to assess the changes in people's sexual functioning.

Results: The mean age of the participants was 33.16 ± 8.31 years. There was a statistically significant difference between the participants according to the decrease in the number of weekly sexual intercourses when they were compared in terms of smoking status, alcohol consumption, marital and parental status, being a health-care worker, having a regular sexual partner, and the working status during the COVID-19 pandemic ($P < .05$, for each). In the subgroup analyses, it was observed that there was a statistically significant difference between the groups for change in the number of sexual intercourses, the number of masturbations, and sexual desire during the COVID-19 pandemic ($P < .05$, for each).

Conclusion: A decline in sexual functioning was observed during the COVID-19 pandemic period. Living in a metropolitan area was associated with a decline in both sexual intercourse frequency and sexual desire during the COVID-19 pandemic. **Karsiyakali N, Sahin Y, Ates HA, et al. Evaluation of the Sexual Functioning of Individuals Living in Turkey During the COVID-19 Pandemic: An Internet-Based Nationwide Survey Study. Sex Med 2021;9:100279.**

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Key Words: COVID-19; Pandemic; Sexual Activity; Sexual Desire; Sexual Functioning

INTRODUCTION

The new coronavirus, which was first reported in December 2019 in Wuhan province of China and named severe acute

respiratory syndrome coronavirus-2 in January 2020, rapidly spread worldwide.¹ Since then, it has become a major health crisis all over the world. In early March 2020, the World Health

Received August 17, 2020. Accepted October 20, 2020.

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<https://doi.org/10.1016/j.esxm.2020.10.007>

Organization declared that corona virus disease 2019 (COVID-19) to be a pandemic.² At the time of writing this article, more than 15 million people have been infected and more than 630,000 people have died in over 200 countries around the world. Although many vaccines and drug studies are being carried out, currently we do not have a specific agent with a high antiviral activity that can fight against the virus.³ For this reason, in many states, citizens encouraged or insisted on self-isolation, followed social distancing rules, wore masks in public areas, and stayed home unless necessary. Moreover, curfews were imposed in some countries particularly where COVID-19 was prevalent.

Psychological and mental health disorders are common during widespread epidemics.⁴ In the COVID-19 pandemic, anxiety and depression symptoms (experienced by 16–28% of the population) and self-reported stress (experienced by 8% of the population) have been common psychological reactions.⁵ Although changes in sexual activity and behavior are the result of a very complex process, it is common knowledge that mental health and psychological factors are directly related with an individual's sexual activity.^{6,7} In addition, decreased sexual activity can have a negative effect on an individual's quality of life and increases the likelihood of depression.^{8,9}

Despite this knowledge, very few articles have investigated the effects of the COVID-19 pandemic on sexual life.^{10–12} Decrease in sexual activity and related factors was observed in a recent study conducted in Britain during the COVID-19 pandemic.¹⁰ Moreover, new detailed reports have been presented regarding the challenges in the practice of sexual medicine from several countries as sexual health is an important health-care issue.¹³

We hypothesized that sexual functioning may worsen due to strict social distancing rules and the contagious nature of the disease among individuals who have no medical history of COVID-19 during the pandemic period. In addition, we also hypothesized that the population density of the cities where individuals live would also have a negative effect on sexual

functioning during the COVID-19 pandemic. In this context, this study aims to investigate the effects of the COVID-19 pandemic on sexual functioning via an Internet-based questionnaire in Turkish individuals who declared no medical history of COVID-19. We believe that reporting changes in sexual activity during the COVID-19 pandemic from a cosmopolitan country like Turkey might contribute to the body of knowledge on this topic.

METHODS

Study Design and Participants

A questionnaire (Supplement 1) evaluating the demographic features, medical history of COVID-19, and sexual functioning of the participants during the COVID-19 pandemic was developed by the researchers. Questions that evaluated the sexual intercourse frequency and sexual desire were formulated based on the International Index of Erectile Function and Female Sexual Function Index (FSFI) forms.^{14,15} Basic Likert-scale questions were used to examine changes in the number of sexual intercourses or masturbation duration, and level of sexual desire of the participants during the COVID-19 pandemic. The survey was uploaded onto Google Forms (<https://docs.google.com/forms>) after obtaining approval from the Ministry of Health of the Republic of Turkey (2020/05/25T15-49-37). The first page of the survey contained information about the research topic. There was an option to either consent to or refuse participation in the survey at the end of this page. Individuals who chose to participate were allowed to complete the survey. The survey link was shared on WhatsApp communication groups and Twitter to reach the maximum number of participants. A total of 1,894 participants completed the survey between June 1 and June 20, 2020. All participants who consented and were living in any city of Turkey were included in the study. The study protocol was also approved by the University of Health Sciences, Bagcilar Training and Research Hospital Ethics Committee for Clinical Research (IRB No: 2020/07/1/01/094). The study was

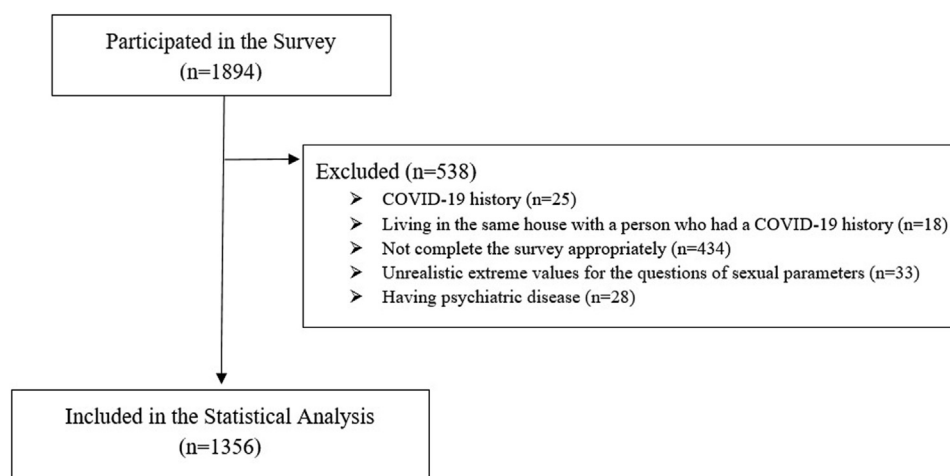


Figure 1. Flowchart of the study. COVID-19 = corona virus disease 2019.

Table 1. Demographic features and sexual functioning of participants during the COVID-19 pandemic

Variables	Mean ± SD	n (%)
Age (years)	33.16 ± 8.31	
Gender		
Female		685 (50.5)
Male		671 (49.5)
Body mass index (kg/m ²)	25.00 ± 8.10	
Smoking status		
No		585 (43.1)
Quit		165 (12.2)
Yes		606 (44.7)
Alcohol consumption		
No		461 (34.0)
Rarely		763 (56.3)
Regular		132 (9.7)
Marital status		
Married		648 (47.8)
Divorced		65 (4.8)
Single		643 (47.4)
Having children		
No		815 (60.1)
Yes		541 (39.9)
Monthly income before pandemic		
<2,500 TL/month		264 (19.5)
2,500–5,000 TL/month		429 (31.6)
5,000–10,000 TL/month		422 (31.1)
>10,000 TL/month		241 (17.8)
Working status during pandemic		
Stable		520 (38.3)
Changed to part-time		675 (49.8)
Unemployed		161 (11.9)
Change in number of sexual intercourses during pandemic (in a week)		
Lower		553 (40.8)
Same		640 (47.2)
Higher		163 (12.0)
Change in number of masturbations during pandemic (in a week)		
Lower		190 (14.0)
Same		844 (62.2)
Higher		322 (23.7)
Change in sexual intercourse/ masturbation duration		
Longer		245 (18.1)
Stable		710 (52.4)
Shorter		401 (29.6)
Change in sexual desire		
Higher		364 (26.8)
Stable		565 (41.7)
Lower		427 (31.5)

COVID-19 = corona virus disease 2019; TL = Turkish lira.

conducted in accordance with the Declaration of Helsinki and its later amendments.

Participants who declared a COVID-19 history ($n = 25$), those living in the same house with a person who had a COVID-19 history ($n = 18$), those who did not answer all the questions of the survey ($n = 434$), those who declared unrealistic and/or extreme values for the number of sexual intercourses and/or masturbation frequency (eg, ≥ 50 in a week) ($n = 33$), and those with any known psychiatric disease ($n = 28$) were excluded from the study (Figure 1). A total of 1,356 participants who met the inclusion criteria were included in the statistical analysis.

The study population was divided into 2 subgroups based on the population density of the cities in which the individuals lived to evaluate whether population density had any effect on the sexual functions of the participants during the COVID-19 pandemic. Subgroup A included participants who lived in cities with a population of over 4,000,000 (Istanbul, Ankara, and Izmir), while subgroup B included the rest of the participants who lived in other cities in Turkey with a population of under 4,000,000. The subgroups were compared in terms of changes in the sexual functioning of participants during the COVID-19 pandemic.

Statistical Analysis

Statistical analysis was performed using the SPSS version 22.0 software (IBM Corp, Armonk, NY). The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to check the normality of data for quantitative variables. Continuous variables were expressed in mean and SD, while categorical variables were expressed in number and frequency. Student's t -test and Pearson's chi-square tests were used wherever possible. A 2-sided P value of $<.05$ was considered statistically significant.

RESULTS

The mean age of the participants was 33.16 ± 8.31 years. There were 685 (50.5%) females and 671 (49.5%) males included in the study. Demographic features, economic and working status, and changes in the sexual functioning of the participants during the COVID-19 pandemic are summarized in Table 1. 26.6% (361) of the participants were health-care workers and 66.8% (906) of the participants had a regular sexual partner. Of the participants, 233 (17.2%) had at least 1 chronic disease. Diabetes mellitus, hypertension, and coronary artery disease were observed in 31 (2.3%), 40 (2.9%), and 8 (0.6%) of the participants, respectively.

The mean number of sexual intercourses before the COVID-19 pandemic was 1.86 ± 1.67 per week while this decreased to 1.35 ± 2.04 during the COVID-19 pandemic. The mean masturbation frequency of participants before the COVID-19 pandemic was 1.25 ± 1.63 per week which increased to

Table 2. Comparisons of participants according to decline in the number of weekly sexual intercourses during the COVID-19 pandemic

Variables	Decline in number of sexual intercourses (in a week)				P value
	No (n = 803, 59.2%)		Yes (n = 553, 40.8%)		
	Mean ± SD	n (%)	Mean ± SD	n (%)	
Age (years)	33 ± 8		33 ± 8		.453*
Gender					.339 [†]
Female	397 (49.4)		288 (52.1)		
Male	406 (50.6)		265 (47.9)		
Body mass index (kg/m ²)	25.20 ± 9.02		24.70 ± 6.56		.264*
Smoking status					.003 ^{†,‡}
No	376 (46.8)		209 (37.8)		
Quit	87 (10.8)		78 (14.1)		
Yes	340 (42.3)		266 (48.1)		
Alcohol consumption	322 (40.1)		139 (25.1)		<.001 ^{†,‡}
No	413 (51.4)		350 (63.3)		
Rarely	68 (8.5)		64 (11.6)		
Regular					
Marital status					<.001 ^{†,‡}
Married	419 (52.2)		229 (41.4)		
Divorced	34 (4.2)		31 (5.6)		
Single	350 (43.6)		293 (53.0)		
Having children					.027 ^{†,‡}
No	463 (57.7)		352 (63.7)		
Yes	340 (42.3)		201 (36.3)		
Health-care worker					.043 ^{†,‡}
No	573 (71.4)		422 (76.3)		
Yes	230 (28.6)		131 (23.7)		
Having a regular sexual partner					.003 ^{†,‡}
No	292 (36.4)		158 (28.6)		
Yes	511 (63.6)		395 (71.4)		
Monthly income before pandemic					.369 [†]
<2,500 TL/month	147 (18.3)		117 (21.2)		
2,500–5,000 TL/month	258 (32.1)		171 (30.9)		
5,000–10,000 TL/month	246 (30.6)		176 (31.8)		
>10,000 TL/month	152 (18.9)		89 (16.1)		
Working status during pandemic					.001 ^{†,‡}
Stable	322 (40.1)		198 (35.8)		
Changed to part-time	407 (50.7)		268 (48.5)		
Unemployed	74 (9.2)		87 (15.7)		
Decline in sexual intercourse/masturbation duration					<.001 ^{†,‡}
No	686 (85.4)		269 (48.6)		
Yes	117 (14.6)		284 (51.4)		
Decline in sexual desire					<.001 ^{†,‡}
No	651 (81.1)		278 (50.3)		
Yes	152 (18.9)		275 (49.7)		

COVID-19 = corona virus disease 2019; TL = Turkish lira.

*Student's *t*-test.

[†]Pearson's chi-square test.

[‡]*P* < .05.

1.57 ± 2.11 during the COVID-19 pandemic. 553 (40.8%) participants reported a reduction in the number of weekly sexual intercourses while 427 (31.5%) participants complained about lower sexual desire during the COVID-19 pandemic (Table 1).

When the participants were compared according to the decrease in the number of weekly sexual intercourses, no significant difference was observed between age, gender, and body mass index (*P* > .05, for each). In contrast, there was a

statistically significant difference between the participants according to the decrease in the number of weekly sexual intercourses when they were compared in terms of smoking status, alcohol consumption, marital and parental status, being a health-care worker, having a regular sexual partner, and working status during the COVID-19 pandemic ($P < .05$, for each) (Table 2). There was also a statistically significant difference in terms of sexual intercourse or masturbation duration and sexual desire status of the participants when they were compared according to the decrease in the number of weekly sexual intercourses ($P < .001$, for each) (Table 2). There was a statistically significant difference between the participants according to the decrease in sexual desire when they were compared in terms of age, gender, smoking status, marital and parental status, having a regular sexual partner, and working status during the COVID-19 pandemic ($P < .05$, for each).

When the subgroups were compared in terms of sexual parameters, it was observed that there was a statistically significant difference between the groups for changes in the number of sexual intercourses, the number of masturbations, and sexual desire during the COVID-19 pandemic ($P < .05$, for each) (Table 3).

DISCUSSION

Although the study population had a relatively young mean age, our study results showed a decline in sexual functioning during the COVID-19 pandemic. Smoking, being single, not

having a child, having a regular sexual partner, and being unemployed during the COVID-19 pandemic were associated with a decline in both sexual intercourse frequency and sexual desire. Age and gender were not associated with a decline in the mean number of sexual intercourses; however, being older and a woman were associated with a decline in sexual desire. In addition to that, living in a metropolitan area was associated with a decline in both sexual intercourse frequency and sexual desire during the COVID-19 pandemic according to our study results. This difference may be attributed to the fact that prevention rules (self-isolation, social distancing, wearing a mask, and curfew, etc) for disease transmission during the pandemic would be more strict in these crowded cities when compared to the rural areas. In addition, more number of COVID-19 cases reported in big cities may have affected individuals' sexuality.

Many studies have reported that frequent sexual intercourse is beneficial to psychological health, improves quality of life, and reduces the risk for certain cancers and deadly coronary diseases.^{16,17} In addition, a U.K. based study reported that increased sexual activity was associated with greater enjoyment of life.¹⁸ In light of these data, our study results suggest that the quality and enjoyment factors of life of the participants were negatively affected by the COVID-19 pandemic.

In a study with 868 participants, which was conducted in Britain during the COVID-19 pandemic, being sexually active, defined as having at least 1 sexual intercourse per week, was related to being a young male, being married or in a domestic

Table 3. Comparisons of subgroups in terms of changes in sexual parameters during the COVID-19 pandemic

Variables	Subgroup A*	Subgroup B [†]	P value
	Mean ± SD n (%)	Mean ± SD n (%)	
Change in number of sexual intercourses (in a week)			.023 ^{‡,§}
Decreased	329 (44.0)	224 (36.8)	
Same	330 (44.1)	310 (51.0)	
Increased	89 (11.9)	74 (12.2)	
Change in number of masturbations (in a week)			.001 ^{‡,§}
Decreased	124 (16.6)	66 (10.9)	
Same	436 (58.3)	408 (67.1)	
Increased	188 (25.1)	134 (22.0)	
Change in duration			.103 [‡]
Shorter	229 (30.6)	172 (28.3)	
Stable	373 (49.9)	337 (55.4)	
Longer	146 (19.5)	99 (16.3)	
Change in sexual desire			.001 ^{‡,§}
Decreased	247 (33.0)	180 (29.6)	
Stable	279 (37.3)	286 (47.0)	
Increased	222 (29.7)	142 (23.4)	

COVID-19 = corona virus disease 2019.

*Cities with a population of over 4,000,000 in Turkey (Istanbul, Ankara, and Izmir).

[†]All other cities with a population of under 4,000,000 in Turkey.

[‡]Pearson's chi-square test.

[§] $P < .05$.

partnership, consuming alcohol, and practicing self-isolation/social distancing for a large number of days.¹⁰ Similarly, alcohol consumption, marital status, having a regular sexual partner, and being a woman were associated with worsening sexual functions according to our study results during the COVID-19 pandemic. Interestingly, in our study population, the mean number of sexual intercourses tended to decrease while the mean number of masturbations had increased values when compared to the pre-pandemic period. These results might suggest that individuals were afraid of disease transmission during sexual intercourse and preferred to satisfy themselves in terms of sexuality without needing a partner.

In a study based in China that evaluated the changes in sexual behaviors during the COVID-19 pandemic, 37% of the participants reported a decrease in the overall sexual frequency.¹² In this study, the authors reported that age, partner relationship, and sexual desire were closely related to sexual frequency. In our study, no statistically significant relationship was found between age and decline in sexual intercourse frequency, while there was a statistically significant relationship between age and decline in sexual desire. Participants who declared a decline in sexual desire had a higher mean age than those who did not believe so. One of the important findings of our study was that people living in big metropolitan areas suffered a decline in both sexual intercourse frequency and sexual desire during the COVID-19 pandemic. This may be due to hesitation of being sexually active in big metropolitan areas with a higher population density where the COVID-19 cases were more common. We think it would be valuable for sexual health professionals to focus on this issue since it seems likely that health-care workers were affected less in terms of a decline in sexual intercourse frequency.

In contrast to the current knowledge on this topic, Yuksel et al¹¹ reported an increased frequency of sexual intercourse and sexual desire in females during the COVID-19 pandemic. The patient population in this study was firstly evaluated for the relationship between urinary incontinence and sexual functions 6–12 months ago. It is a well-known fact that urinary incontinence has a negative effect on sexual functions in females and the treatment of urinary incontinence can improve sexual functions.^{19,20} The reason for the inconsistent results may be because this patient population was treated for urinary incontinence; therefore, it seems logical that their FSFI scores were better when compared to their previous results. In another study from Italy, which evaluated the sexual functions and quality of life in reproductive-age women during the COVID-19 pandemic, decreased FSFI scores were observed similar to our study results.²¹ Working outside one's home, university education level, and parity ≥ 1 were reported as independent risk factors for lower FSFI scores.²¹

Although there is no proven relationship between unemployment and sexual activity, it is well-known that unemployment increases the risk of depression.^{22,23} Both the effects of the global health crisis and psychological problems caused by

unemployment may have been reflected in the results of the present study. Unfortunately, we did not evaluate the anxiety and/or depression status of the participants by validated questionnaires. In fact, our aim was to facilitate filling the survey by participants in these unexpected hard times like the COVID-19 pandemic. In this context, we chose to exclude participants who had a known psychiatric disease from the study. Therefore, we could not provide any additional information between the psychiatric status of an individual and sexual functions of participants during the COVID-19 pandemic according to our study results. This might be an interesting topic for further research.

This study had some potential limitations. First, all subdomains of the international validated scales for examining sexual functions, such as International Index of Erectile Function and FSFI, were not evaluated. Second, we did not evaluate the anxiety and/or depression status of the participants by validated questionnaires such as Beck Anxiety/Depression Inventory and State and Trait Anxiety Inventory, etc. It is worth mentioning that self-reporting of psychiatric disorders via an Internet-based questionnaire might have led to selection bias. In addition, sexual intercourse frequency and sexual desire perception of individuals may have changed during the COVID-19 pandemic. Therefore, it is also worth noting that self-reporting of sexual functioning might have led to recall bias. Unfortunately, our study results have not been able to discriminate the reasons as to how COVID-19 distress mediated among the individuals (fear of contagion, depressed mood, social stressors exacerbated by the pandemic, etc). Finally, the medical history of COVID-19 disease was not evaluated by an objective test like polymerase chain reaction. Nonetheless, as the fear of COVID-19 disease transmission is still common among the public, we do not think this situation has affected our study results. However, this study was conducted with a large number of participants and investigated a wide range of variables compared to previous studies. Therefore, our study results might contribute to the body of knowledge on changes in sexual functions of individuals during the COVID-19 pandemic period.

CONCLUSION

Although the population in this study had a relatively young mean age, the results showed a decline in sexual functioning during the COVID-19 pandemic period. The negative effects of the COVID-19 pandemic on sexual health were observed in our study population. Smoking, being single, not having a child, having a regular sexual partner, and being unemployed during the COVID-19 pandemic were associated with a decline in both sexual intercourse frequency and sexual desire. Living in a metropolitan area was associated with a decline in both sexual intercourse frequency and sexual desire during the COVID-19 pandemic. We believe that our study results can be used to raise public awareness on the importance of sexual health, which is linked to the quality of life, during the COVID-19 pandemic.

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Conflict of Interest: The authors report no conflicts of interest.

Funding: None.

STATEMENT OF AUTHORSHIP

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SUPPLEMENTARY DATA

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.esxm.2020.10.007>.