

Impact of COVID-19 pandemic on quality of partner relationship and sexual activity among COVID positive males: a cross sectional study

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Abstract. – OBJECTIVE: Our aim was to assess sexual activity, partner relationships among males who had been infected with COVID-19, to study the impact of COVID-19 infection on partner relationship and to find out the association between partner and sexual relationship during lockdown.

MATERIALS AND METHODS: A cross sectional study was conducted in Saudi Arabia through social media platforms via online questionnaire between December 1, 2020 and January 31, 2021 among 871 participants after a pilot study among 20 participants of which 497 were included in the study. Statistical analysis was conducted using SPSS version 20.0 (IBM Inc., Armonk, NY, USA). Responses were presented as frequencies and percentages and the association was studied using Chi squared test/Fisher's exact test. The value of $p \leq .05$ was considered significant.

RESULTS: Out of the total study participants, nearly 85% of them belonged to the age range of 18 to 39 years, more than half of the participants were married. In the six months prior to the study being conducted, 268 respondents (53.9%) did not have sexual relationships. Respondents with positive COVID-19 infection reported that their partner lived with them in the same house during home isolation and was also found to be significantly associated with having intact sexual relationships in the last six months of the lockdown period (p -value < .001). More-

over, respondents who reported having good relationships with their partners during the pandemic were found to be significantly associated with having intact sexual relationships during the pandemic lockdown (p -value < .001).

CONCLUSIONS: Among the COVID-19-positive respondents, sexual activity and partner relationships were largely found to be intact during the pandemic lockdown period.

Key Words:

COVID-19, Sexual relationship, Partner relationship.

Introduction

Coronavirus illness, also known as COVID-19, was first detected in Wuhan, China on December 31, 2019¹ and was declared a pandemic by the World Health Organization (WHO) on March 11, 2020². This disease has proven to be a severe public health threat³. After a long period, the epidemic has wreaked havoc on the planet in the year 2020⁴. The infectious agent responsible for the "Coronavirus Disease 2019" (COVID-19) pandemic, which is causing a significant number of illnesses and deaths, is SARS-CoV-2. As of 5:49 a.m. CET on March 12, 2022, there had been 452,201,564 confirmed cases of COVID-19

reported to WHO, with 6,029,852 deaths. A total of 10,712,423,741 vaccine doses have been provided as of March 12, 2022⁵. Fever is the most prevalent symptom, followed by cough, myalgia or tiredness, excretion, and dyspnea⁶. COVID-19 can also cause severe symptoms that can lead to major complications such as acute respiratory distress syndrome, respiratory failure, sepsis, acute cardiac damage, heart failure, alkalosis, acute kidney injury, and hypoxic encephalopathy⁷. This epidemic has had an impact on every element of human life⁴. Many people have been dealing with mental illnesses like anxiety, sadness, and panic attacks, while others have been dealing with financial issues including unemployment, rising poverty, and diminishing income⁸⁻¹⁰. The impact of the new SARS-CoV-2 virus on human reproductive and sexual health is of special concern. Restriction of people's activities, decreased sports participation, economic concerns, increased psychological stress, and decreased entertainment have all had a significant impact on sexual activity and functioning¹¹.

Sexual activity is a broad term that encompasses many different types of sexual actions and expressions. Sexual intercourse, emotional closeness, close friendship, flirtation, affection, caressing, hugging, kissing, desire, and masturbation are all examples of sexual activity¹²⁻¹⁵. The COVID-19 pandemic has been shown to alter the frequency, length, and quality of sexual behaviour^{16,17}. Sexual intercourse could pose a significant risk of infection¹⁸ because it necessitates close physical contact, and SARS-CoV-2 is easily transferred at this distance¹⁹. Due to lockdown, people may be forced to stay in close proximity to or away from their sexual partners, which may have an emotional impact on their relationship and, as a result, their sexual behaviour²⁰. COVID-19-related lockdowns have impacted every part of daily life, but it's unknown whether they have had an impact on sexual activity.

Until now, no study in Saudi Arabia has evaluated the impact of COVID-19 lockdown period and virus infection on male sexual health. With the support of available data from the literature in this regard, we conducted an observational study aiming to assess sexual activity, partner relationships among males who had been infected with COVID-19, to study the impact of COVID-19 infection on partner relationship and sexual health of males and to find out the association between

partner and sexual relationship and between sexual activity and common risk factors for erectile dysfunction during lockdown.

Materials and Methods

A cross sectional study was conducted in Saudi Arabia through social media platforms for a duration of 2 months between December 1, 2020 and January 31, 2021. The minimum sample size was estimated to be 377, with a 5% margin of error and a confidence interval (%) of 95% using the Raosoft® website. Data were collected through an online survey, using convenience sampling technique. The survey questionnaire was prepared, pretested and validated by conducting a pilot study among 20 subjects. The validity and clarity of the questionnaire were confirmed by the senior medical and research experts. The questionnaire was administered *via* the Google Forms platform (Google LLC, Mountain View, CA, USA) and distributed *via* social media, including the Twitter and WhatsApp applications. The survey request was received *via* Twitter or *via* WhatsApp messages. These messages provided the study's purpose and the link to the study, as well as asked permission for participation. After subjects clicked on the survey link, a cover page detailed the study's title, the purpose of the study, and the time needed for completion of the survey. For the sake of confidentiality, we did not collect respondents' contact details such as e-mail ID or require registration. If they agreed to participate, they were asked to click "start the survey" and begin answering the survey questions. Participation was voluntary, and complete anonymity was ensured. A total of 871 participants received the questionnaire. Of these, 497 males who had been infected with COVID-19 in the last 6 months, were sexually active, were over 18 years old and were enrolled in the study. The survey questionnaire included five sections that began with demographic data, general health information, assessment of the new coronavirus infection course and symptoms during the infection and evaluation of the impact of COVID-19 infection on men's sexual health and partner relationships during the pandemic. Statistical analysis on the quantitative data included in the survey was conducted using the statistical software IBM SPSS version 20.0 (SPSS, Inc. IBM, Armonk, NY, USA). Responses were presented as frequencies and percentages. Comparisons between sur-

vey variables were analysed *via* Chi squared test/ Fisher's exact test as required. The value of p -value $\leq .05$ was considered significant. The study was approved by the Research Ethics Committee of Majmaah University, Saudi Arabia.

Results

The questionnaire was distributed to 871 subjects, of whom 497 (57%) subjects with a history of COVID-19 infection were recruited for the study, while the remaining who reported no COVID-19 infection were excluded. Nearly 85% of the participants belonged to the age range of 18 to 39 years, with most (58%) belonging to the 18-29 years age group. More than half of the participants were married, 258 (51.9%), and had a bachelor's degree, 254 (51.1%). Of the respondents, 349 (70.2%) never smoked, while 144 (29%) were smokers; moreover, one drank alcohol (0.2%) while three (0.6%) used tobacco and alcohol.

The participants most commonly had positive COVID-19 infection in the months of August, July, and June –84 (16.9%), 77 (15.5%), and 64 (12.9%), respectively – and least commonly in March, 22 (4.4%). The swab test (nose or throat) was conducted on 486 (97.8%) to confirm the diagnosis of COVID-19. After diagnosis, 82 (16.5%) were admitted to the hospital, of whom 16 (3.2%) were shifted to the ICU (Table I). The participants with positive COVID-19 experienced some

symptoms during the illness, with fever being the most common symptom, 365 (73.4%), followed by headache, 356 (71.6%); fatigue and tiredness, 329 (66.2%); aches and pain, 315 (63.4%); and loss of smell or taste, 314 (63.2%). Other symptoms can be seen in Figure 1.

Figure 2 depicts that during the COVID-19 pandemic lockdown, around 260 respondents (52.3%) reported that they or their partner met people with positive COVID-19 infection. Meanwhile, 268 (53.9%) reported that their partner lived with them in the same house during the home isolation, and 193 (38.8%) reported that their partner was infected with COVID-19. In the six months prior to the study being conducted, 268 respondents (53.9%) did not have sexual relationships, while 229 (46.1%) did. Regarding fertility, 29 (5.8%) had been diagnosed with male infertility before the COVID-19 pandemic, while 468 (94.2%) did not report such a diagnosis. Furthermore, 226 (45.5%) had children while 271 (54.5%) did not.

Figure 3 presents the sexual behaviour and partner sexual relationship during the COVID-19 pandemic lockdown, where we see that 84 (16.9%) agreed that their sexual desire decreased, 91 (18.1%) confirmed their sexual intercourse frequency decreased, sexual satisfaction decreased in 76 (15.3%), masturbation frequency increased in 89 (18%), pornography use increased in 59 (11.9%), condom use increased in 50 (10%), usage of oral sex-enhancing drugs increased in 35 (7%),

Table I. Time of COVID-19 infection, method of diagnosis and hospital admission among responders (N = 497).

S. No.	Variables	Frequency	% age
1.	Month of COVID-19 infection		
	March	22	4.4
	April	24	4.8
	May	47	9.5
	June	64	12.9
	July	77	15.5
	August	84	16.9
	September	72	14.5
	October	52	10.5
	November	32	6.4
	December	23	4.6
	2.	Method of diagnosis	
By swab (nose or throat)		486	97.8
	By blood test	11	2.2
3.	Hospital admission		
	Yes	82	16.5
	No	415	83.5
4.	Admission to the intensive care unit		
	Yes	16	3.2
	No	481	96.8

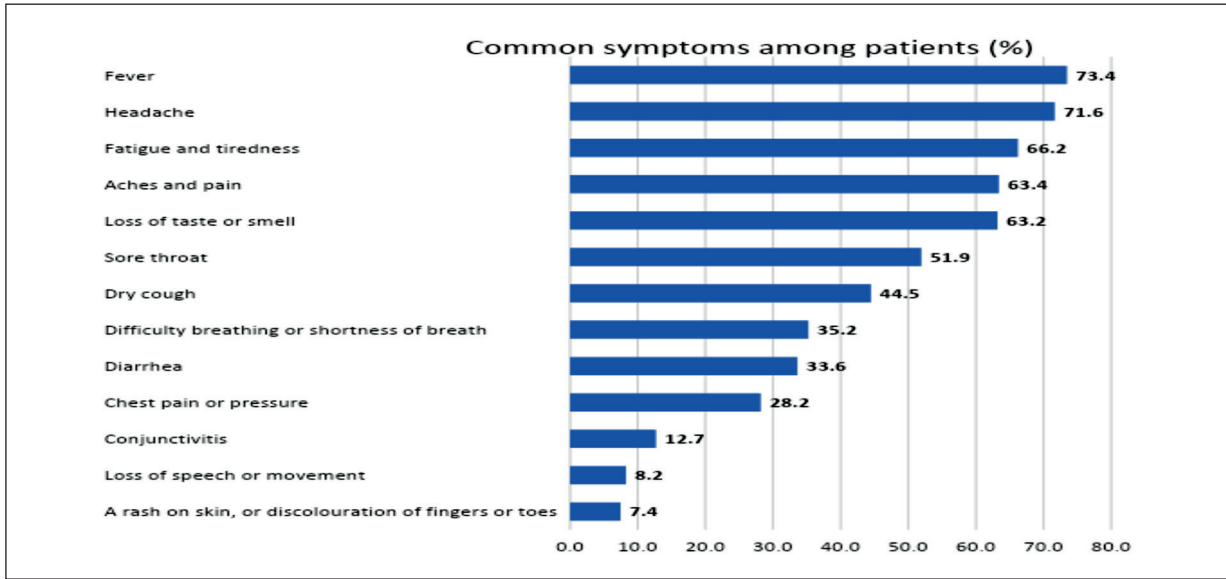


Figure 1. Common symptoms among patients of COVID-19 (n = 497).

and, finally, 37 (7.4%) reported an increase in the practice of abnormal sexual behaviors like multiple sexual partners.

Association between the status of the relationship with one's partner and sexual relationships during lockdown in the last six months was evaluated *via* Chi-squared test (Table II). Among the respondents who had high level of agreement regarding good relationship status, there was a

significant association with having intact sexual relationships during the pandemic lockdown (p -value < .001). Furthermore, the respondents who were infected with COVID-19 and who reported that their partner lived with them in the same house during home isolation were also found to be significantly associated with having intact sexual relationship in the last six months (p -value < .001).

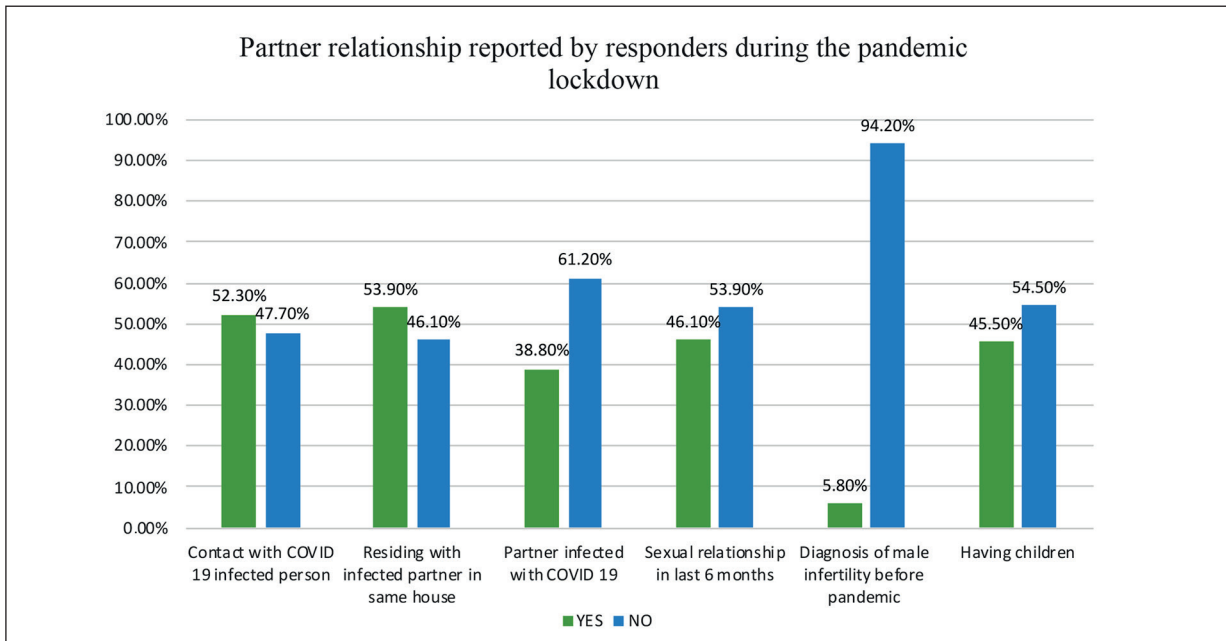


Figure 2. Partner relationship reported by responders during the pandemic lockdown.

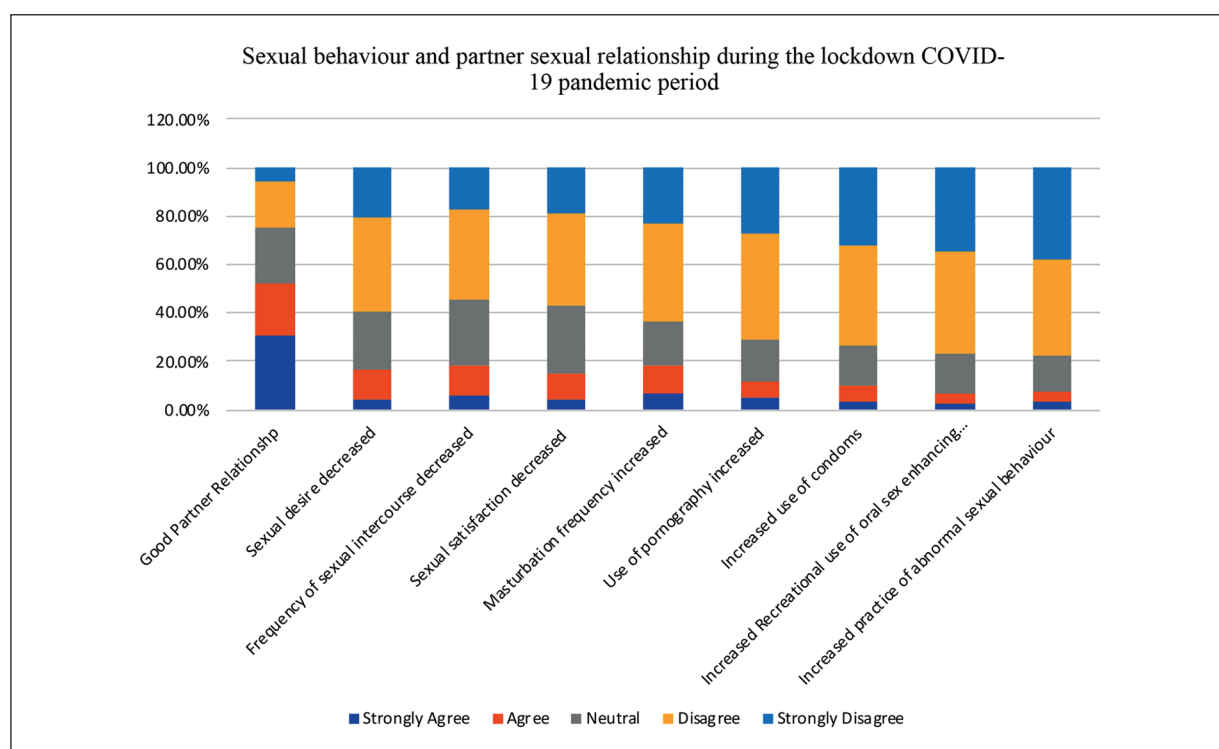


Figure 3. Sexual behaviour and partner sexual relationship during the lockdown COVID-19 pandemic period.

When participants were asked about the common risk factors associated with erectile dysfunction (ED), the most common risk factors found among the participants were hypertension (HTN) 55 (11.1%), diabetes mellitus (DM) 54 (10.9%), psychological problems, 46 (9.3%) and dyslipidemia (DLP) 37 (7.4%).

We looked for an association between the four questions regarding male sexual activity and the top four common risk factors for erectile dysfunction (diabetes mellitus, dyslipidemia, hypertension, and psychological problems) *via* Chi-square test (Table III). None were found to be significantly associated with increased use of

Table II. Correlation between current partner and sexual relationship during the lockdown COVID-19 pandemic period.

	In the last six months, have you had a sexual relationship?				Total	p-value
	Yes		No			
	N	%	N	%		
My relationship with my partner is good						
Strongly Agree	112	48.9	39	14.6	151	<.001
Agree	60	26.2	48	17.9	108	
Neutral	42	18.3	73	27.2	115	
Disagree	10	4.4	85	31.7	95	
Strongly Disagree	5	2.2	23	8.6	28	
After you get COVID-19 infection, during your home isolation, does your partner live with you in the same house?						
Yes	180	78.6	88	32.8	268	<.001
No	49	21.4	180	67.2	229	
Total	229		268		497	

*Chi-square test.

Table III. Correlation between sexual activity and common risk factors for erectile dysfunction among responders.

	Risk factors	Agree		Neutral		Disagree		p-value*
		N	%	N	%	N	%	
Recreational use the oral sex enhancing drugs like PDE5-inhibitors increased	Diabetes mellitus	3	5.6%	11	20.4%	40	74.1%	0.675
	Hypertension	2	3.6%	9	16.4%	44	80.0%	0.571
	Dyslipidemia	3	8.1%	6	16.2%	28	75.7%	0.966
	Psychological problems	5	10.9%	12	26.1%	29	63.0%	0.079
My sexual satisfaction decreased	Diabetes mellitus	8	14.8%	18	33.3%	28	51.9%	0.595
	Hypertension	13	23.6%	15	27.3%	27	49.1%	0.172
	Dyslipidemia	11	29.7%	18	48.6%	8	21.6%	< 0.001
	Psychological problems	17	37.0%	13	28.3%	16	34.8%	< 0.001
My sexual intercourse frequency decreased.	Diabetes mellitus	7	13.0%	19	35.2%	28	51.9%	0.314
	Hypertension	16	29.1%	13	23.6%	26	47.3%	0.081
	Dyslipidemia	11	29.7%	15	40.5%	11	29.7%	0.007
	Psychological problems	15	32.6%	17	37.0%	14	30.4%	0.002
My sexual desire decreased	Diabetes mellitus	8	14.8%	14	25.9%	32	59.3%	0.870
	Hypertension	17	30.9%	10	18.2%	28	50.9%	0.013
	Dyslipidemia	13	35.1%	14	37.8%	10	27.0%	< 0.001
	Psychological problems	15	32.6%	10	21.7%	21	45.7%	0.011

*Chi-square test.

recreational oral sex-enhancing drugs like phosphodiesterase type 5 inhibitors (PDE5i). Dyslipidemia (DLP) and psychological problems were significantly associated with a decrease in sexual satisfaction (p -value $< .001$), with more participants being neutral as compared to agreement or disagreement among dyslipidemic patients, while participants with psychological problems tended to agree. Dyslipidemic participants and those with psychological problems tended to be neutral rather than agree or disagree when asked about a decrease in sexual intercourse frequency, which was significant (p -value = $.007$ and p -value = $.002$, respectively). Hypertensive participants disagreed that their sexual desire decreased (p -value = $.003$), as did those with psychological problems (p -value = $.011$), while dyslipidemic participants were more neutral (p -value $< .001$).

Discussion

The rising number of COVID-19 cases worldwide, along with rapid changes in daily life, has left the majority of people fearful and frightened. There have been numerous outbreaks in the past, including the SARS epidemic of the last decade, the swine flu (influenza A H1N1) pandemic, and the Ebola epidemic, all of which have had a detrimental influence on human health. The modern world, on the other hand, has never seen an outbreak as severe as the COVID-19 pandemic. The first incidence of COVID-19 in Saudi Arabia was discovered on March 2, 2020, when a patient who was verified to be sick arrived from outside, followed by a rapid increase in cases²¹. The pattern of sexual activity and partner relationship quality during the COVID-19 pandemic is poorly reported; to our knowledge, this is the first report from Saudi Arabia to show an impact of COVID-19 lockdown on partner relationship quality and sexual activity among SARS-CoV-2 infected respondents.

According to our study, almost half of the respondents (57%) reported positive COVID-19, and 97.8% were diagnosed *via* either a nose or throat swab. Those participants with positive COVID-19 were most infected in the months of August, July, and June, 84 (16.9%), 77 (15.5%), and 64 (12.9%), respectively. Consistent with a similar report by Alharbi et al²² the highest number of tests for COVID-19 occurred in July, while positive cases were most frequently detected in June (19.55%). Few cases among our study were

admitted to either the hospital or the ICU (19.7%). This may be due to the strict measures that have been implemented by the Saudi government to monitor COVID-19 spread from the moment the crisis was announced, when the external and internal lockdowns were successfully carried out in the early stages of the pandemic²³.

The potential impact of COVID-19 on male reproductive and sexual function is controversial. The evidence of transmembrane protease, serine 2 (TMPRSS2) expression in lung tissue, which is an androgen-regulated gene that is expressed mainly in the adult prostate, may explain the high susceptibility of the male gender to severe complications of COVID-19²⁴. Moreover, angiotensin-converting enzyme 2 (ACE-2) acts as a functional receptor for SARS-CoV-2, and male hormones are effective in the ACE-2 pathways which facilitate SARS-CoV-2 entry into host cells²⁴. Studies²⁵⁻²⁷ suggest that the novel SARS-CoV-2 enters the cells *via* ACE2, which is highly expressed in testis; therefore, there is a potential risk of testicular injury.

In our study, the male participants who had been infected with COVID-19 experienced some symptoms related to COVID-19, with fever being most common, 365 (73.4%), followed by headache, 356 (71.6%). Fever has been accused of causing testicular damage due to the destruction of germ cells in constant high temperature, as well as leucocyte infiltration *via* the destruction of Leydig cells, which follows with a decline in testicular testosterone levels²⁸. Despite the low percentage of our respondents reporting diagnosis with male infertility before the pandemic (5.8%), preliminary findings suggest that the COVID-19 pandemic has affected the male genital system in direct and indirect ways, with a negative impact on male reproductive health inducing spermatogenic failure.

We were able to find an association between co-existing predisposing factors for ED among respondents with positive COVID-19. The most common comorbid risk factor for ED among the participants was HTN, 55 (11.1%), followed by DM, 54 (10.9%), psychological problems, 46 (9.3%), and DLP, 37 (7.4%). Although the relation with such risk factors was low in our study, none of the commonly reported comorbidities were found to be significantly associated with increased use of recreational oral sex-enhancing drugs like PDE5i, for example, which may be due to difficulty in obtaining such medications during the lockdown and may also be related

to the low reported recreational use of oral erectile dysfunction medications, 35 (7%). Participants with DLP and psychological problems were significantly associated with decreased sexual satisfaction (p -value $< .001$), while participants with HTN and those with psychological problems disagreed that their sexual desire decreased (p -value = .003 and p -value = .011, respectively). Even though a small percentage of participants reported MSD-related symptoms during the COVID-19 pandemic lockdown, just 84 (16.9%) reported that their sexual desire decreased, while 91 (18.1%) said that their sexual intercourse frequency decreased and 76 (15.3%) that their sexual satisfaction decreased. Our data were less remarkable than Li et al²⁹ results in this regard, where 212 (22%) had a decrease in sexual desire, and 396 (41%) experienced a decrease in the frequency of sex.

The huge sample size and use of a validated questionnaire among diverse socio-cultural circumstances in Saudi Arabia are two of the study's primary strengths. Nonetheless, this is the first study examining the influence of the COVID-19 pandemic lockdown on sexual behaviour and partner relationships in Saudi Arabia. This finding could lay the groundwork for future research in this field.

There were certain limitations to our research. In particular, a self-report approach was used, and due to the nature of the cross-sectional study based on convenience sampling and non-verification of response sources, participant selection bias was unavoidable.

Conclusions

Sexual activity and partner relationships remained mainly intact in Saudi Arabia during the COVID-19 pandemic lockdown, while decreased sexual activity was observed among certain sexually active adult men with predisposing characteristics for male sexual dysfunction.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Acknowledgements

The authors would like to thank the Deanship of Scientific Research at Majmaah University for supporting this work under Project Number No. R-2022-182.

Authorship Statements

Meshari Alzahrani: Conceptualization, Methodology, Validation, Investigation, Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, Supervision, Project Administration, Funding Acquisition; Mohammad Alkhamees: Conceptualization, Validation, Writing – Review & Editing, Supervision; Saad Abumelha: Validation, Writing – Review & Editing, Supervision; Muhammad Khan: Software, Formal Analysis, Data Curation; Zainab Al Jaziri: Writing – Original Draft, Investigation, Data Curation; Fay Althunayyan: Writing – Original Draft, Investigation, Data Curation. Mohammad Ahmad: Conceptualization, Validation, Writing – Review & Editing, Supervision.

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