International Journal of Medical Arts

Volume 5, Issue 12, December 2023
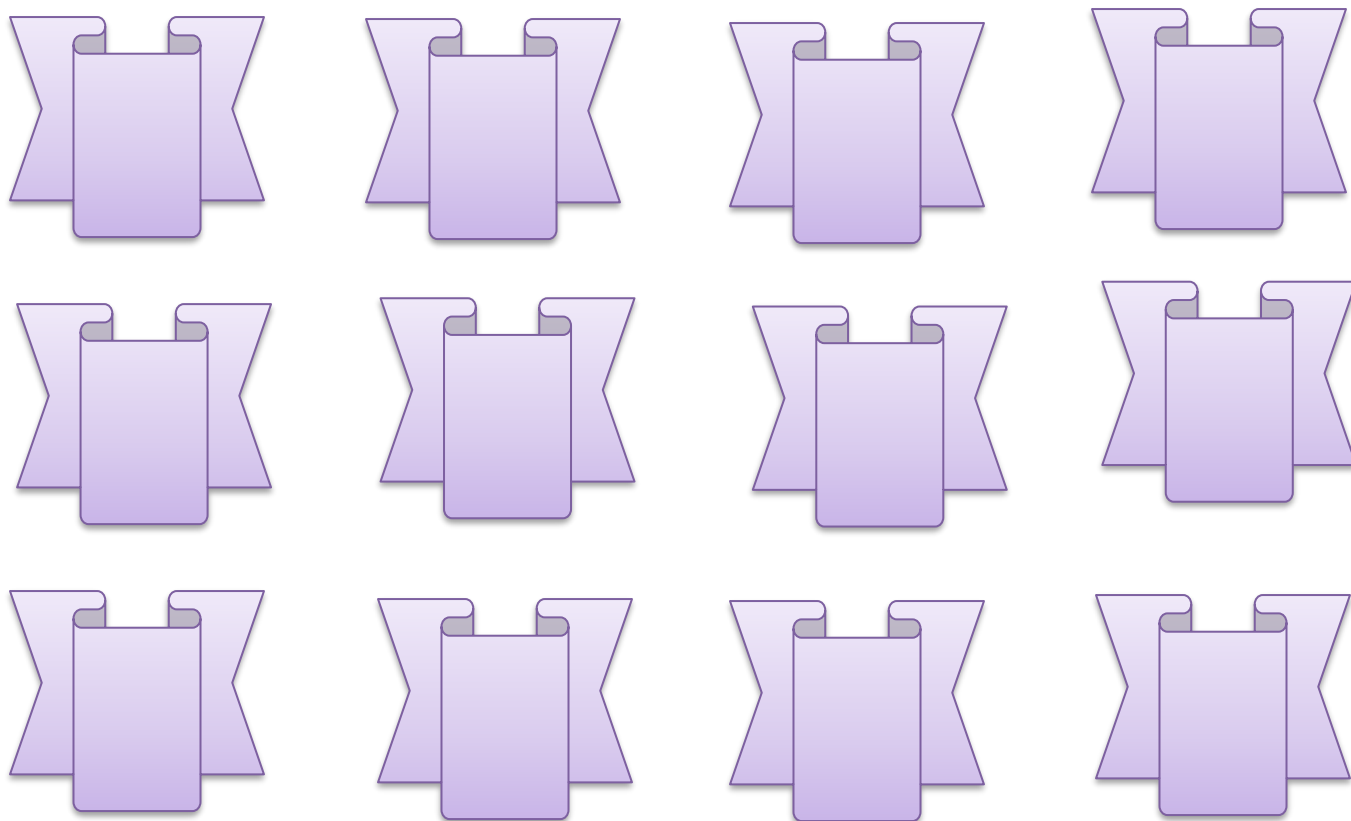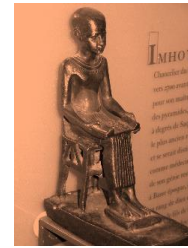
Original Article

Evaluation of Sexual Health in Post COVID-19 Infection Males

Ahmed Mohamed Abd-Elfattah Elkholy *, Abd-Elshakour Abd-Elhafiz Abd-Elwahed Almohammady, Mohamed Ismail M. Kamel

Department of Dermatology, Venereology and Andrology, Faculty of Medicine, Al-Azhar University, Cairo, Egypt

ABSTRACT

Background: There is not sufficient knowledge available at this point about how COVID-19 affects sexual behaviors. On the other hand, some cross-national research reported a shift in behavioral sexuality. It was reported that in men, COVID-19 recovery is linked to mood disorders and decreased sexual function.

The Aim of the work: This study aims to evaluate sexual functions in recovered COVID-19-infected males.

Patients and Methods: This study was conducted on 500 recovered COVID-19-infected males. The data was collected in the form of an International Index of Erectile Function-5[IIEF5] validated questionnaire form all study patients recruited from Al-Azhar University Hospitals. All study participants were instructed to finish the IIEF-5 questionnaire twice; the first questionnaire depended on their prior experience before the COVID-19 infection, and the second questionnaire was according to their post-infection situation.

Results: A statistically significant difference was observed for total IIEF mean scoring six months before COVID-19 infection and four weeks after COVID-19 recovery among the studied subjects where the mean total IIEF was 23.5 ± 5.1 before COVID-19 infection and 16.2 ± 2.9 after COVID-19 [p <.0001]. The mean scoring erectile function domain was significantly higher in the studied subjects before COVID-19 infection compared with their mean after COVID-19 recovery with a p-value of <.0001. Also, the mean overall satisfaction domain was significantly higher before COVID-19 infection [p= 0.001].

Conclusion: There was a noticeable decrease in the sexual function, erection abilities domain, and overall satisfaction domain after COVID-19 infection.

Keywords: Sexual Health; COVID-19; International Index of Erectile Function-5.

INTRODUCTION

For general wellness, well-being, and life quality, a good sexual life is essential. It is not only being free of illness, malfunction, or disability; rather, it is characterized as a condition of sexuality-related mental, emotional, physical, and social health. Any problem that keeps a person from feeling fulfilled with sexuality at any point during a relationship can be referred to as sexual dysfunction [1].

COVID-19, also known as SARS-CoV-2, is a highly infectious virus primarily brought on by coronaviruses. On March 3, 2020, the World Health Organization declared the disease a worldwide outbreak. Fever, dry cough, exhaustion, and dyspnea are typical COVID-19 symptoms. However, there have also been reports of symptoms involving several organs affection, including damage to the digestive tract, urinary tract infection, circulatory systems, liver damage, and endothelial cell dysfunction in convalescent patients [2].

Up till August 2021, Egypt had over 288 thousand COVID-19 confirmed infections and around 16.676 thousand mortalities overall [3]. There is not sufficient knowledge available at this point about how COVID-19 affects sexual behaviors. On the other hand, some cross-national research reported a shift in behavioral sexuality [4].

Ricks *et al.* [5] detected a reduction in young male and female sexuality. However, a survey conducted in Bangladesh, India, and Nepal regarding lockdown conditions and their impact on sexuality reveals a 3.3% rise in individuals' frequency of sexual activity from one up to five times weekly to over five times weekly. They also showed that in men, COVID-19 recovery is linked to mood disorders and decreased sexual function.

Kresch *et al.* [6] demonstrates that a particle of the COVID-19 virus related to penile vascular endothelial cells after the initial infection in humans.

So, this study aims to evaluate sexual functions in recovered COVID-19-infected males.

PATIENTS AND METHODS

Patient and Study population: This study conducted on 500 recovered COVID-19-infected males. The data was collected in the form of an International Index of Erectile Function-5 [IIEF5] validated questionnaire form all study patients recruited from Al-Azhar University Hospitals. All subjects informed about the aim and the details and secrecy of the research.

Ethical consideration: An informed consent taken from all cases before enrollment in the study. All participants who consented infected with COVID-19 and recovered enrolled in our study. The Department of Dermatology, Venerology, and Andrology Ethics Committee for Clinical Research at Al-Azhar University also accepted the research protocol.

Patient Criteria

Inclusion criteria: [1] The ability to read and write, [2] Living with wife, [3] Sexually active men with a history of Recent recovery of covid 19, [4] Prior to the infection period, all of the cases were engaged in sexual activity, and [5] Age 18–65 years.

Exclusion criteria: [1] Men treated for erectile dysfunction, [2] Men did not have a stable sexual life for the previous 4 weeks, [3] Men suffered from physical and psychiatric problems, and [4] Currently using antidepressant or anti-psychotropic drugs.

Methods

All study participants were subjected to the following

History taking: sexual history, medical history and sexual evaluation before and after COVID-19.

Demographic data: age, occupation, marital status, special habits, medical and surgical history.

Examinations

Clinical examination including blood pressure measurement, fasting blood glucose level, thyroid enlargement, peripheral pulse variation, and lower limb edema.

Genital examination: determine any anomalies in the genital anatomy, check for co-morbid illnesses, and identify high-risk factors for ED.

Assessment of Erectile Function: All study participants were instructed to finish the IIEF-5 questionnaire twice; the first questionnaire depended on their prior experience before the COVID-19

infection, and the second questionnaire was according to their post-infection situation. The investigators created a questionnaire to assess the subjects' sexuality, medical records related to COVID-19, and demographic characteristics throughout the outbreak. Depending on the IIEF, questions were developed to assess the quantity of sexual activity and sexual desire. Details on the study's topic were included on the questionnaire's first page. At the bottom of this page, there was a choice to accept or reject joining the questionnaire. The questionnaire could be completed by those who wished to participate.

Statistical Analysis: The overall analysis was carried out by applying IBM® SPSS software [version 21.0]. Whereas continuous data were expressed as mean and standard deviation [SD] for data with a normal distribution or median and the quartile range [IQR] for data with abnormal distribution. Categorical data were displayed as numbers with percentages. To check for normality, the Shapiro-Wilk test was employed. Prior to comparison, any data that were not normally distributed were log-transformed. The independent t-test was employed for contrasting continuous parameters, and the chi-square test was employed to contrast categorical data in order to ascertain the variation in clinical features between the baseline and the follow-up cohort, in which some individuals were lost. A linear mixed effect model [LMM] was used to examine the temporal alterations in erectile dysfunction condition and psychiatric parameters prior to and following the 4-week COVID-19 infection recovery period. Hence, continuous data, which included the IIEF-5, was evaluated by LMM. To assess the statistical value of continuous parameters, an independent t-test was employed. The ANOVA test was used to ascertain the statistical variation between groups for the categorical variables. The accepted criteria for statistical significance were $P < 0.05$.

RESULTS

The study analyzed data from 500 subjects with a history of COVID-19 infection attending Al-Azhar University hospitals in the time frame of January 2022 to January 2023. Table [1] presents the characteristics of the studied subjects. The mean of the studied subjects was 38.1 ± 9.4 years. About one-fifth of the studied subjects were smokers [20.6%]. According to the degree of severity of COVID-19, about two-thirds of the studied cases were treated at home [68.1%], 25.6% were treated at the hospital [19.2%

without complications and 6.4% with subsequent complications] and 6.4% were admitted to ICU.

Table [2] shows the mean scoring of total IIEF-5 and its domains before and after COVID-19 infection among the studied subjects. A statistically significant difference was observed for total IIEF mean scoring six months before COVID-19 infection and four weeks after COVID-19 recovery among the studied subjects where the mean total IIEF was 23.5 ± 5.1 before COVID-19 infection and 16.2 ± 2.9 after COVID-19 [p <.0001]. The mean scoring erectile function domain was significantly higher in the studied subjects before COVID-19 infection compared with their mean after COVID-19 recovery with a p-value of <.0001. Also, the mean overall satisfaction domain was significantly higher before COVID-19 infection [p= 0.001].

Table [3] shows the mean score of total IILF-5 before and after COVID-19 by the degree of severity of COVID-19. The total mean score of IILF-5 among the studied patients was significantly decreased 4 weeks after COVID-19 infection. The decrease in mean scoring of this domain was greater among ICU admitted patients [from 22.4 ± 4.9 before COVID-19 to 15.3 ± 3.9 after COVID-19] and among hospitalized patients with subsequent complications [from 22.4 ± 5.3 before COVID-19 to 15.5 ± 2.7 after COVID-19].

Table [4] presented the mean score of the erectile functioning domain before and after COVID-19 by degree of severity of COVID-19. The mean score of the erectile functioning domain was substantially decreased among patients 4 weeks after COVID-19 infection, among all management methods. It showed a high decrease among hospitalized patients with subsequent complications [from 17.6 ± 0.97 before COVID-19 to 12.4 ± 2.2 after COVID-19], and ICU-admitted patients [from 17.5 ± 0.74 before COVID-19 to 12.2 ± 3.1 after COVID-19].

Table [5] presented the mean score of the overall satisfaction domain before and after COVID-19 by the degree of severity of COVID-19. The mean score of this domain was significantly decreased among patients 4 weeks after COVID-19 infection, among all management methods. However, the decrease was more among hospitalized patients with subsequent complications [from 4.3 ± 0.74 before COVID-19 to 3.0 ± 0.74 after COVID-19] and ICU patients [from 4.5 ± 0.97 before COVID-19 to 3.1 ± 0.71 after COVID-19].

Table [6] presented the correlation between the erectile functioning domain, overall satisfaction domain, and total score IIEF-5 before and after COVID-19. The findings showed that the mean score for the erectile functioning domain, overall satisfaction domain, and total score IIEF-5 was significantly lower after COVID-19 infection compared with the mean score before COVID-19 infection.

Table [7] shows the correlation between of erectile function domain, overall satisfaction domain, and IIEF-5 according to the degree of severity of COVID-19 using Kruskal Wallis test statistics. The results showed that the patients admitted to the ICU and outpatients had the lower total score [mean rank] for the studied erectile function domain, overall satisfaction domain, and IIEF-5, although not statistically significant.

Table [1]: Characteristics of studied subjects

Characteristics*		N= 500
Age in years; mean ± SD [Range]		38.1 ± 9.4 [18-60]
Smoking status	Yes	103 [20.6]
	No	397 [79.4]
Degree of severity of COVID-19	Home isolation and treatment	340 [68.1]
	Hospitalization	96 [19.2]
	Hospitalization with subsequent complications	32 [6.4]
	ICU admission	32 [6.4]

*Data are presented by mean ± SD or by n [%].

Table [2]: Comparison of mean scoring total IIEF-5 and its erectile function domain and overall satisfaction domain before and after COVID-19 infection among the studied subjects [n= 500]

IIEF score and its domains	Six months before COVID-19	Four weeks after COVID-19	P value
Total IIEF-5 [0-25]	23.5 ± 5.1	16.2 ± 2.9	<.0001*
Erectile function domain [0-20]	17.5 ± 3.5	12.9 ± 2.4	<.0001*
Overall satisfaction domain [0-5]	4.3 ± 1.1	3.2 ± 0.78	0.001*

*Significant

Table [3]: Mean score of total IIEF-5 before and after COVID-19 by degree of severity of COVID-19

Degree of severity of COVID-19	Six months before COVID-19	Four weeks after COVID-19	P value
Outpatient	22.7 ± 5.2	16.5 ± 2.8	<.0001*
Hospitalization	22.3 ± 5.4	15.7 ± 3.0	<.0001*
Hospitalization with subsequent complication	22.4 ± 5.3	15.5 ± 2.7	<.0001*
ICU admission	22.4 ± 4.9	15.3 ± 3.9	<.0001*

*Significant

Table [4]: The mean score of erectile function domain before and after COVID-19 by the degree of severity of COVID-19

Degree of severity of COVID-19	Six months before COVID-19	Four weeks after COVID-19	P value
Outpatient	17.7 ± 0.72	13.2 ± 2.3	<.0001*
Hospitalization	17.5 ± 0.71	12.5 ± 2.4	<.0001*
Hospitalization with subsequent complications	17.6 ± 0.97	12.4 ± 2.2	<.0001*
ICU admission	17.5 ± 0.74	12.2 ± 3.1	<.0001*

*Significant

Table [5]: The mean score of overall satisfaction domain before and after COVID-19 by the degree of severity of COVID-19

Degree of severity of COVID-19	Six months before COVID-19	Four weeks after COVID-19	P value
Outpatient	4.5 ± 0.71	3.5 ± 0.74	**<.0001***
Hospitalization	4.3 ± 0.79	3.1 ± 0.71	**<.0001***
Hospitalization with subsequent complications	4.4 ± 0.74	3.0 ± 0.74	**<.0001***
ICU admission	4.5 ± 0.97	3.1 ± 0.88	**<.0001***

*Significant

Table [6]: Correlation of erectile function domain, overall satisfaction domain, and IIEF-5 before and after COVID-19

Factor	Time	Mean	SD	median	IQR*	Z score	P value
Erectile function domain	Before COVID	17.5	3.1	16	3	33.8	**<.0001****
	After COVID	12.9	2.4		2		
Overall satisfaction domain	Before COVID	4.3	1.1	13	2	13.4	**<.0001****
	After COVID	3.2	0.8		1		
Total score IIEF-5	Before COVID	23.5	5.1	20	4	36.1	**<.0001****
	After COVID	16.2	2.9	16	3		

*Interquartile range. **Significant

Table [7]: Correlation of erectile function domain, overall satisfaction domain, and IIEF-5 according to degree of severity of COVID-19

Factor	Degree of severity of COVID-19	Mean Rank	Statistical value K. W.**	Degree of freedom	P-value
Erectile function domain	Outpatient	248.5	2.3	3	0.51
	Hospitalized	261.5			
	Hospitalized with- subsequent complications	266.3			
	ICU	222.6			
Overall satisfaction domain	Outpatient	249.1	1.6	3	0.65
	Hospitalized	252.8			
	Hospitalized with- subsequent complications	273.9			
	ICU	234.5			
IIEF-5	Outpatient	248.9	2.9	3	0.40
	Hospitalized	258.7			
	Hospitalized with- subsequent complications	274.7			
	ICU	217.8			

*Interquartile range **Significant *** Kruskal Wallis

.

DISCUSSION

Covid-19 was deemed a global outbreak in 2020, Since then, several studies have been conducted to assess its effects on sexual health and erectile function. The pandemic has prompted a decline in the level of sexual satisfaction. Additionally, concerns about the transmission of the virus between partners have caused anxiety and desperation [7]. COVID-19 has led to sexual avoidance and precautions among men and women, affecting their sexual function [8].

The current study evaluated the effect of COVID-19 on sexual functions in recovered COVID-19-infected males. It was conducted on 500 recovered COVID-19-infected males. The results of the current investigation showed that the average age of the male subjects was [38.1 ± 9.4] years. About one-fifth of the studied males were smokers [20.6%]. According to the degree of severity of COVID-19, about two-thirds of the studied cases were treated at home [68.1%], [25.6% were treated at a hospital [19.2%] without complications and [6.4%] with subsequent complications] and 6.4% were admitted to the ICU.

The current study revealed that; the mean total IIEF-5 was [23.5 ± 5.1] six months before COVID-19 infection and [16.2 ± 2.9] four weeks after COVID-19 with a statistically significant difference observed for total IIEF mean scoring six months before COVID-19 infection and four weeks after COVID-19 recovery among the studied subjects [p <.0001]. The results of this investigation corroborated those of **Masoudi et al.** [9], who showed that following COVID-19 infection, men's mean total IIEF scores considerably dropped.

The results of this investigation showed that the mean scoring of the erectile function domain of IIEF-5 was [17.5±3.5] six months before COVID-19 infection and [12.9±2.4] four weeks after COVID-19 infection. Following the COVID-19 recovery, there has been a substantial decline in erectile function domain score [p-value <0001].

As regard the mean scoring of overall satisfaction domain of IIEF-5 was [4.3±1.1] six months before COVID-19 infection and [3.2 ± 0.78] four weeks after COVID-19 infection and [p value <.0001]. The results of this investigation corroborated those of **Mohammadi et al.** [7], who found that; the mean scoring of the sexual satisfaction domain of IIEF-5 declined after the Covid-2019 infection compared to the pre-Covid status and the mean erectile function score declined after Covid-2019 infection in males compared to the pre-covid.

Regarding how COVID-19 severity affects sexual functioning, the results of the present investigation showed that the total mean score of IILF-5 for outpatient treated patients was [22.7±5.2] six months before COVID-19 infection and [16.5±2.8] four weeks after COVID-19 infection, patients admitted to hospital without complication was 22.3±5.4 six months before COVID-19 infection and [15.7±3.0] four weeks after COVID-19 infection, hospitalized patients with subsequent complications after COVID-19 infection from 17.6 ± 0.97 before COVID-19 to 12.4 ± 2.2 after COVID-19 infection, and ICU admitted patients from 17.5 ± 0.74 before COVID-19 infection to 12.2 ± 3.1 after COVID-19.

These outcomes were consistent with those found in the investigation of **Mohammadi** *et al.* [7], who supposed that a more severe case with a history of ICU admission had a more severe decline in the total score of IIEF-5 compared to the outpatient setting and showed that ICU admitted patients had a lower total IIEF-5 than hospitalized patients. As a result of the current investigation, a substantial variation was observed for the mean score of erectile function domain among the studied subjects where a severe decrease among hospitalized patients with subsequent complications from 17.6 ± 0.97 before COVID-19 to 12.4 ± 2.2 after COVID-19], and ICU admitted patients from 17.5 ± 0.74 before COVID-19 to 12.2 ± 3.1 after COVID-19 with p-value of <0001. The findings of this study agreed with those of **Ardestani and Arab** [10], they showed that a more severe case with a history of ICU admission had a more severe decrease in erectile function domain score compared to the outpatient setting.

The results of this investigation showed that the average score of the overall satisfaction domain was significantly decreased among hospitalized patients with subsequent complications from [4.3 ± 0.74] before COVID-19 to [3.0 ±0.74] after COVID-19] with a p-value of <0001 and ICU patients from [4.5 ± 0.97] before COVID-19 to [3.1 ± 0.71] after COVID-19] with a p-value of <0001. The results of this investigation were consistent with those of **Mohammadi** *et al.* [7], who found that the patients admitted to the ICU had a more substantial decline in the overall satisfaction domain score than patients admitted to hospital and outpatient settings.

Conclusion: There was a noticeable decrease in the sexual function, erection abilities domain, and overall satisfaction domain after COVID-19

infection. The mean score of total IILF-5, erectile function domain, and satisfaction domain in general before and following COVID-19 by the degree of severity of COVID-19 shows a high decrease among hospitalized patients with subsequent complications and ICU admitted patients.

REFERENCES

1. Mitchell KR, Lewis R, O'Sullivan LF, Fortenberry JD. What is sexual wellbeing and why does it matter for public health? Lancet Public Health. 2021 Aug;6[8]: e608-e613. doi: 10.1016/S2468-2667[21]00099-2.

2. Cascella M, Rajnik M, Aleem A, Dulebohn SC, Di Napoli R. Features, Evaluation, and Treatment of Coronavirus [COVID-19]. 2023 Aug 18. In: StatPearls [Internet]. Treasure Island [FL]: StatPearls Publishing; 2024 Jan–. PMID: 32150360.

3. Bahlol M, Dewey RS. Pandemic preparedness of community pharmacies for COVID-19. Res Social Adm Pharm. 2021 Jan;17(1):1888-1896. doi: 10.1016/j.sapharm.2020.05.009.

4. Arafat SMY, Alradie-Mohamed A, Kar SK, Sharma P, Kabir R. Does COVID-19 pandemic affect sexual behaviour? A cross-sectional, cross-national online survey. Psychiatry Res. 2020 Jul;289:113050. doi: 10.1016/j.psychres.2020.113050.

5. Ricks JM, Spahnie M, Matthews A, Copen CE, Rushmore J, Bernstein KT, Miller WC, Turner AN. Changes in Sexual Behavior Over the COVID-19 Pandemic Among a Community-Based Cohort of Men Who Have Sex With Men in Columbus, Ohio. Sex Transm Dis. 2022 Dec 1;49[12]:844-850. doi: 10.1097/OLQ.0000000000001719.

6. Kresch E, Achua J, Saltzman R, Khodamoradi K, Arora H, Ibrahim E, *et al.* COVID-19 Endothelial Dysfunction Can Cause Erectile Dysfunction: Histopathological, Immunohistochemical, and Ultrastructural Study of the Human Penis. World J Mens Health. 2021 Jul;39[3]: 466-469. doi: 10.5534/wjmh.210055.

7. Mohammadi A, Dialameh H, Hamidi M, Kazemi MH, Rahnejat AM, Taghavian SM, Namdari F. Effect of Covid-2019 infection on main sexual function domains in iranian patients. Translat Res Urol. 2022;4[1]:41-6.

8. Aolymat I, Abdul Kadir L, Al Nsour M, Taha H. The Impact of the COVID-19 Pandemic on Female Sexual Function in Jordan: Cross-sectional Study. JMIR Form Res. 2023 Feb 16;7:e40772. doi: 10.2196/40772.

9. Masoudi M, Maasoumi R, Bragazzi NL. Effects of the COVID-19 pandemic on sexual functioning and activity: a systematic review and meta-analysis. BMC Public Health. 2022 Jan 28;22[1]:189. doi: 10.1186/s12889-021-12390-4.

10. Ardestani Zadeh A, Arab D. COVID-19 and male reproductive system: pathogenic features and possible mechanisms. J Mol Histol. 2021 Oct;52[5]:869-878. doi: 10.1007/s10735-021-10003-3.

International Journal

of Medical Arts