

# Factors associated with sexual intercourse among Brazilian men during the COVID-19 pandemic: a cross-sectional study

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## ABSTRACT

**Introduction:** Transmission of COVID-19 occurs from person to person through respiratory droplets and aerosol, through contact and direct transmission, through kissing, handshaking, etc. In this perspective, several countries have implemented actions and strategies to reduce the risks of transmission. Because of this, there are several widespread reflexes and concerns resulting from the COVID-19 pandemic. One change in behavior that can be affected due to the social distance that occurred during the COVID-19 pandemic is sexual activity. **Objective:** To analyze the factors associated with the sexual intercourse of Brazilian men during the COVID-19 pandemic. **Methods:** 518 men over 18 years of age responded to the online survey that included sociodemographic, clinical, behavioral, and anthropometric characteristics and the International Index of Erectile Function (IIEF). The sample was divided into two groups according to the practice of sexual intercourse during the COVID-19 pandemic. **Results:** Through multivariate regression analysis, being satisfied or equally dissatisfied/satisfied with sex life and being in a stable relationship were the factors associated with the sexual intercourse of Brazilian men during the COVID-19 pandemic. In addition, not drinking alcohol was a protective factor for sexual intercourse in this sample. **Conclusion:** In our study, being satisfied or equally dissatisfied/satisfied with the overall sex life and having a stable relationship were associated with intercourse during a COVID-19 pandemic. On the other hand, not drinking alcohol was considered a protective factor.

**Keywords:** COVID-19; disease transmission, infectious; Behavior; Pandemic; coitus; men's health.

## INTRODUCTION

In December 2019, coronavirus disease 2019 (COVID-19) first emerged in Wuhan, Hubei province, China, spreading rapidly in early 2020 around the world<sup>1,2</sup>. In March 2020, the World Health Organization (WHO) declared the outbreak of COVID-19 to be a global pandemic<sup>3</sup>. Since then, the total number of reported cases in the world has

How to cite this article: Silva et al. Factors associated with sexual intercourse among Brazilian men during the COVID-19 pandemic: a cross-sectional study. *ABCS Health Sci.* 2022;47:e022211  
<https://doi.org/10.7322/abcshs.2021118.1846>

Received: May 20, 2021  
Revised: Nov 10, 2021  
Approved: Dec 13, 2021

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Declaration of interest: nothing to declare  
Funding: CNPq (153702/2020-6)



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increased, reaching 154,640,649 cases of infections and 3,232,385 deaths by May 06, 2021<sup>4</sup>. Until the same date, among the countries with the highest number of registered cases, Brazil had 14,930,183 cases of infections and 414,399 deaths<sup>5</sup>.

Although the origin of the initial transmission of COVID-19 is unknown, transmission from person to person occurs through respiratory droplets and aerosol, contact and by direct transmission, through kissing, handshaking<sup>6,7</sup>, etc. In this perspective, several countries have implemented actions and strategies with the main objective of reducing transmission risks<sup>8</sup>. For this, classic health measures and freedom restrictions were adopted, as well as self-isolation, social distance, travel restrictions, suspension, postponement and/or cancellation of events, reduced hours and/or closing of commercial establishments, and quarantine for infected or suspected people and their close contacts<sup>2-8</sup>. Because of this, there are several widespread reflexes and concerns resulting from the COVID-19 pandemic, causing physical morbidity and mortality and problems in mental health, economics, education, and interpersonal relationships<sup>9-13</sup>. According to Jacob et al.<sup>7</sup> a behavioral change that can be affected due to the social distance that occurred during the COVID-19 pandemic is sexual activity. However, despite extensive media discussions, more high-quality studies are needed to investigate sexual health during the COVID-19 pandemic<sup>14</sup>.

According to the WHO, sexuality covers several factors, such as sex, sexual orientation, gender identities, intimacy, etc., and is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviors, practices, roles, and relationships<sup>15</sup>. Thus, the change in human behavior that occurred during the COVID-19 pandemic can affect individuals' physical and mental health, resulting in sexual behaviors that diverge from the normal context<sup>16,17</sup>. Maintaining an active sex life or reintroducing frequent sexual activity in the context of the pandemic can mitigate possible negative consequences of social detachment to contain COVID-19<sup>7</sup>. According to Turban et al.<sup>14</sup> all forms of sexual contact represent a potential risk of viral transmission, which can cause sexual abstinence for fear of contracting COVID-19. For Alpalhão and Filipe<sup>18</sup> the closure of leisure venues can significantly reduce the opportunity for casual sexual encounters. According to Jacob et al.<sup>7</sup> the promotion of good physical and mental health during the period of self-isolation/social detachment from COVID-19 should also include individuals who abstain from alcohol since alcohol consumption was associated with greater activity in the UK. On the other hand, Yuksel and Ozgor<sup>19</sup> observed that more time at home during the COVID-19 pandemic could increase the frequency of sexual acts with their partners.

Given the different impacts of the COVID-19 pandemic on sexual activity/behavior, studies covering diverse populations are needed to examine the influence of the COVID-19 pandemic on

sex life in different cultures and countries, according to the implementation of social distance. We hypothesize that 1) men in a stable relationship, regardless of cohabiting with their partner, are more likely to have sex during periods of isolation/social distancing; 2) men who do not consume alcohol are less likely to have sex during periods of social isolation<sup>7</sup>.

Therefore, this study aimed to analyze the factors associated with the sexual intercourse of Brazilian men during the COVID-19 pandemic

## METHODS

Cross-sectional study with data collected from a larger study to evaluate the sexual function and genital self-image of Brazilian men. This study was approved by the Institutional Ethics Committee under opinion n°. 4.027.422. Data were collected from June to September 2020.

### Participants and procedures

Due to social distance rules in Brazil, men were invited to participate in the study through social media and instant messaging applications such as Instagram, Facebook, Twitter, and WhatsApp. Men who were interested in participating in the research returned contact and were informed about the study objectives and evaluation methods. Upon confirming interest, data collection instruments and consent forms were sent to the participants through editable files with instructions for filling out. There was no financial benefit for the participants and consent to participate in the research was obtained voluntarily after clarification of the research, as well as the risks and benefits of their participation. Participants were also informed that they could withdraw from the research at any time without any harm. In addition, no information was requested that favored identification, and the data collected were kept confidential and used exclusively for statistical analysis.

Men over 18 years of age, with Brazilian nationality, residing in Brazil, and able to read and write in Brazilian Portuguese were included. Participants were excluded if they had a self-reported psychiatric disease, such as psychosis, schizophrenia, or mental retardation, and if they were transsexual. The sample was divided into two groups - men who had intercourse and men who had no intercourse - according to the practice of sexual intercourse in the last four weeks. Sexual intercourse was defined as sexual intercourse performed or attempted vaginal/anal penetration with another person.

### Sample characterization

To characterize the sample, a questionnaire was applied containing sociodemographic information (age, skin color, years of study, relationship status, and sexual orientation), clinical (anxiety

and depression diagnosed by a medical evaluation), behavioral (performing physical exercise or sport, use of tobacco and alcohol) and anthropometric (self-reported weight and height). Weight and height were used to calculate the body mass index (BMI) in kg/m<sup>2</sup>.

### International Index of Erectile Function (IIEF)

The IIEF is a validated and translated instrument into Brazilian Portuguese<sup>20</sup> that assesses male sexual function in the last four weeks<sup>21</sup>. The IIEF contains 15 items divided into 5 domains of sexual function: erectile function, orgasm function, sexual desire, intercourse satisfaction, and overall satisfaction. Items are scored on a five- or six-point Likert scale with higher scores indicating better sexual function<sup>21</sup>. For this study, the scores of the domain “sexual desire” and item 13 (In general, how satisfied have you been with your sex life?) related to the domain “general satisfaction with sex life” of IIEF were used. Item 13 has 5 response alternatives: very dissatisfied, moderately dissatisfied, equally dissatisfied and satisfied, moderately satisfied, and very satisfied. To cover all sexual orientations, we chose to use only this domain and item because the IIEF has been validated and most items are specific to heterosexual men. For the analysis of general satisfaction with sexual life, the response options “very dissatisfied” and “moderately dissatisfied” were grouped into “dissatisfied”; “Equally dissatisfied/satisfied” remained unchanged; and “moderately satisfied” and “very satisfied” were grouped into “satisfied”.

### Statistical analysis

Categorical variables were presented in number and percentage. Continuous variables were presented in median and interquartile range (IQR) due to the non-parametric distribution previously assessed by the Kolmogorov-Smirnov test. For the bivariate analysis between groups, the Chi-square or Fisher’s exact tests were used for categorical variables and the Mann-Whitney test for quantitative variables. Effect sizes (ES) were estimated using the phi coefficient for binary categorical variables, Cramer’s V for categorical variables with more than 2 categories, and Cohen’s d for continuous variables<sup>22</sup>. ES was calculated using the formula  $z/\sqrt{N}$ :  $\leq 0,10$  – null effect;  $0,11$  a  $0,29$  – weak effect;  $0,30$  a  $0,49$  – moderate effect;  $e \geq 0,50$  – great effect. In the multivariate analysis of the data, multivariate logistic regression was performed for the variables with  $p \leq 0.2$  in the bivariate analysis. The results of the logistic regression analysis are presented in odds ratios (OR) and 95% confidence intervals (95% CI). If there was any missing answer, the participants were immediately asked after returning the data collection instruments. Thus, there was no missing value. A significance level of 5% was adopted for the analysis. The data were analyzed using SPSS 22.0.

## RESULTS

Five hundred and eighteen men ( $24.5 \pm 5.4$  years of age) participated in the study and returned with answered questionnaires. In the total sample, most participants lived in the southern part of Brazil ( $n=317$ ; 61.2%), declared themselves white ( $n=348$ ; 67.2%), and had incomplete higher education ( $n=326$ ; 62.9%). Table 1 shows the comparison and association of sociodemographic and sexual function characteristics between groups of men who had sexual intercourse during the COVID-19 pandemic ( $n=306$ ; 59.1%) and those who did not have sexual intercourse ( $n=212$ ; 40.9%) (Table 1).

**Table 1:** Comparison and association of the characterization and sexual function variables of Brazilian men according to sexual intercourse during the COVID-19 pandemic (N=518).

Variables	Sexual intercourse		p	ES
	Yes (n=306) Median (IQR) or n (%)	No (n=212) Median (IQR) or n (%)		
Age (years)	24 (5)	22 (4)	<0.001*	0.177
Skin color			0.711	0.036
White	208 (68)	140 (66)		
Black	32 (10.5)	20 (9.5)		
Other	66 (21.5)	52 (24.5)		
Years of study	16 (3)	15 (3)	<0.001*	0.170
Relationship status			<0.001*	0.358
Single	166 (54.3)	187 (88.2) <sup>‡</sup>		
In a stable relationship	140 (45.7)	25 (11.8)		
BMI (kg/m <sup>2</sup> )	24.2 (4.2)	23.5 (3.9)	0.017*	0.104
Sexual orientation			0.001*	0.169
Heterosexual	151 (49.3) <sup>‡</sup>	81 (38.2)		
Homosexual	121 (39.5)	82 (38.7)		
Other	34 (11.2)	49 (23.1) <sup>‡</sup>		
Smoke			0.046*	0.091
No	251 (82)	188 (88.7) <sup>‡</sup>		
Yes	55 (18)	24 (11.3)		
Alcoholic beverage			0.003*	0.131
Yes	253 (82.7) <sup>‡</sup>	152 (71.7)		
No	53 (17.3)	60 (28.3)		
Physical exercise			0.165	0.062
Yes	202 (66)	127 (60)		
No	104 (34)	85 (40)		
Anxiety			0.589	0.026
No	242 (79.1)	163 (76.9)		
Yes	64 (20.9)	49 (23.1)		
Depression			0.562	0.032
No	287 (93.8)	202 (95.3)		
Yes	19 (6.2)	10 (4.7)		
Sexual desire	8 (2)	8 (3)	<0.001*	0.161
Overall sexual satisfaction			<0.001*	0.582
Satisfied	235 (76.8) <sup>‡</sup>	41 (19.3)		
Equally dissatisfied/satisfied	41 (13.4)	59 (27.8)		
Dissatisfied	30 (9.8)	112 (52.9) <sup>‡</sup>		

IQR: Interquartile range. ES: Effect size. BMI: Body mass index. <sup>‡</sup>: Residual adjustment >2.0. \* $p < 0,05$ .

The variables age ( $p < 0.001$ ), years of study ( $p < 0.001$ ), relationship status ( $p < 0.001$ ), BMI ( $p = 0.017$ ), sexual orientation ( $p = 0.001$ ), smoking ( $p = 0.046$ ), alcohol consumption ( $p = 0.003$ ), sexual desire ( $p < 0.001$ ) and general sexual satisfaction ( $p < 0.001$ ) showed a significant difference between groups. The ES of the association between the groups was great for general sexual satisfaction (ES=58.20%) and medium for the relationship status (ES=35.80%). Age, years of schooling, BMI, sexual orientation, use of tobacco, alcohol consumption, and sexual desire showed a weak effect (ES<29%) in the association between groups.

In the multivariate logistic regression model, 10 variables were inserted that presented  $p \leq 0.2$  in the bivariate analysis, as shown in table 2. Satisfied men and men who are equally dissatisfied/satisfied with their general sexual life have, respectively, 17.78 (OR=17.78; 95% CI 10.25 - 30.86) and 2.85 (OR=2.85; 95% CI 1.56 - 5.20) times more likely to have sexual intercourse during the COVID-19 pandemic than men who are dissatisfied with their overall sex life. Men who do not drink alcohol have 0.5 (OR=0.50; 95% CI 0.29 - 0.88) less likely to have sexual intercourse during the COVID-19 pandemic than men who drink alcohol. Men in a stable relationship have 4.29 (OR=4.29; 95% CI 2.46 - 7.49) times more likely to have sexual intercourse during the COVID-19 pandemic than single men (Table 2).

**Table 2:** Binary logistic regression of factors associated with sexual intercourse among Brazilian men during the COVID-19 pandemic (N=518).

	Gross analysis OR (95% CI)	Adjusted analysis OR (95% CI)
Age (years)	1.06 (1.02–1.10)	0.97 (0.93–1.01)
Years of study	1.13 (1.06–1.20)	1.08 (1.00–1.16)
BMI (kg/m <sup>2</sup> )	1.04 (0.99–1.09)	1.02 (0.95–1.09)
Sexual desire	1.27 (1.14–1.41)	1.08 (0.94–1.24)
Overall sexual satisfaction		
Dissatisfied	1.00	1.00
Equally dissatisfied/ satisfied	2.59 (1.47–4.57)	2.85 (1.56–5.20)
Satisfied	21.40 (12.70–36.06)	17.78 (10.25–30.86)
Smoke		
No	0.58 (0.35–0.97)	0.56 (0.29–1.08)
Yes	1.00	1.00
Alcoholic beverage		
No	0.53 (0.35–0.81)	0.50 (0.29–0.88)
Yes	1.00	1.00
Relationship status		
Single	1.00	1.00
In a stable relationship	6.31 (3.93–10.13)	4.29 (2.46–7.49)
Sexual orientation		
Heterosexual	1.00	1.00
Homosexual	0.79 (0.54–1.17)	1.19 (0.71–2.00)
Other	0.37 (0.22–0.62)	0.64 (0.33–1.23)
Physical exercise		
No	1.00	1.00
Yes	1.30 (0.90–1.87)	1.21 (0.48–1.97)

OR: Odds ratio. 95% CI: 95% confidence interval. BMI: Body mass index.

## DISCUSSION

This study was aimed to analyze the factors associated with male sexual intercourse during the COVID-19 pandemic. In this sample of men, most participants (59.1%) had sexual intercourse during the period of social isolation/distance. Our hypotheses that men in a stable relationship are more likely to have sexual intercourse during periods of social isolation and men who do not drink alcohol are less likely to have sexual intercourse during periods of social isolation have been confirmed. Sexual satisfaction was another factor associated with sexual intercourse during the COVID-19 pandemic. On the other hand, age, years of study, BMI, sexual desire, smoking, sexual orientation, and physical exercise were not considered factors associated with the sexual intercourse of Brazilian men during the COVID-19 pandemic. In addition, comparisons between groups revealed that men who had sexual intercourse during the COVID-19 pandemic are older, have more years of schooling, have a higher BMI, and, in the majority, are in a stable relationship, declaring themselves heterosexual, do not smoke, drink alcohol and are satisfied with their overall sex life, compared to men who have not had sexual intercourse in the same period.

In this study, most participants had sexual intercourse during the COVID-19 pandemic. Although we have not evaluated the time of social self-isolation, studies have observed the influence of isolation during the COVID-19 pandemic on the sex life of men and women in several countries<sup>7,17,23,24</sup>. In Italy, the decrease in sexual intercourse was related to the lack of domestic privacy and psychological stimuli, as the study subjects shared the house with other family members<sup>23</sup>. In the United States, the relationship related to COVID-19 was associated with a decrease in intimate and sexual behaviors, such as hugs, kisses, caresses, and sexual intercourse, among Americans in a romantic/sexual relationship<sup>24</sup>. In the UK, 60.1% of 868 men and women participating in the study reported not being sexually active during self-isolation/social detachment and 39.9% reported having sexual activity at least once a week<sup>7</sup>. In Taiwan, 13.5% of 1954 men and women reported decreased sexual activity and 13.40% reported decreased demand for sex during the COVID-19 pandemic<sup>17</sup>. The authors believe that the reduction in sexual activity occurred as a form of protection against COVID-19<sup>17</sup>.

In the literature, sexual satisfaction is considered an important component of human sexual function, is associated with sexual behaviors in men<sup>21,25</sup>. In the present study, men who reported being satisfied or equally dissatisfied/satisfied were 17.78 and 2.85 times more likely to have sexual intercourse during the COVID-19 pandemic, respectively. The association between intercourse and sexual satisfaction before the COVID-19 pandemic can be explained by emotional and social support, considering the affective dimension as a central element for sexual dysfunction<sup>25</sup>. During periods of social isolation/detachment in epidemics and pandemics, high general anxiety may be related to decreased satisfaction with sex life. In this case, general anxiety can cause

decreased sexual pleasure and sexual interest, which influences satisfaction with sexual life. In addition, periods of social detachment help prevent the spread of contact diseases, as is the case with COVID-19, but they can also increase general anxiety<sup>17</sup>.

Not drinking alcoholic beverages was considered a protective factor for sexual intercourse during periods of social isolation/distance in the sample of Brazilian men in this study. A similar result was found in a study that evaluated the sexual activity of men and women in the United Kingdom during the COVID-19 pandemic<sup>7</sup>. In a systematic review that verified factors associated with sexual abstinence among young and middle-aged men, young men who never drank alcohol and used cigarettes or drugs were more likely to have sexual abstinence<sup>26</sup>. Despite these studies finding similar results of the effects of alcohol on sexual behavior, this association is not clear in the literature. However, the effects of alcohol on sexual behavior may vary according to the level of intoxication/alcohol consumption<sup>27</sup>. Thus, the results of the present study need to be discussed carefully.

In times of pandemic, being married or in a stable relationship is associated with increased sexual activity in men<sup>7,23</sup>. Our hypothesis that a stable relationship is associated with sexual intercourse during the COVID-19 pandemic in men has been confirmed. In a study conducted with Italian couples, the longest time spent at home with the partner significantly increased the number of sexual intercourses during quarantine<sup>23</sup>. The approach of couples imposed by the impossibility of social contact outside the home, the performance of work at home, and the reduction of work-related stress may have been reasons for the increase in time that couples share and, thus, increase the frequency of relationship sexual<sup>23</sup>. This is important data for stimulating sexual activity among individuals who perform isolation together, as sexual intercourse is not contraindicated if both strictly follow isolation restrictions<sup>28</sup>.

Through the bivariate analysis of this study, the men who had sexual intercourse during the COVID-19 pandemic were older, had more years of study, had higher BMI, lower sexual desire scores, and were mostly nonsmokers and heterosexuals. Although these variables are not considered factors associated with sexual intercourse in the sample of this study, it is important to highlight that other studies have observed the influence of some of these variables on sexual behaviors of men and women during the COVID-19 pandemic<sup>7,17,23,29</sup>. We did not find any study that observed a relationship between years of education/schooling and

BMI with the practice of sexual intercourse by men during social isolation/distance. In general, we suggest that interventions for good mental and sexual health during periods of social isolation/distance also involve younger men, with less education, lower BMI, smokers, from other sexual orientations, and who already have previous problems of sexual dysfunction. In addition, guidance on safe sexual practices should be considered for sexually active men.

This was the first study to assess factors associated with the practice of sexual intercourse by Brazilian men during the COVID-19 pandemic. The results of this study may help to understand sexual intercourse practices during periods of social isolation/distance by researchers in sexual health and sexuality. Despite this, some limitations deserve to be highlighted. First, the study represents a convenience sample of men recruited online, although it has disseminated invitations in various media. Therefore, it may have introduced unintentional trends with homogeneous characteristics, as well as younger, white men, with higher education and without associated diseases. Second, we did not assess the time that participants performed quarantine and social isolation, nor did they perform masturbation. In this case, self-isolation time and masturbation can influence the results of this study<sup>7</sup>. Third, other sexual behaviors, such as masturbation and the use of pornography, were not evaluated in this study, which could help to better understand the practice of sexual intercourse during the COVID-19 pandemic among Brazilian men. Finally, the use of self-reported measures, such as weight and height for determining BMI, may not represent the actual value of the measures. However, a Brazilian study found adequate agreement values between self-reported anthropometric measures and assessed objectively<sup>30</sup>.

## Conclusion

In this sample of Brazilian men, being satisfied or equally dissatisfied/satisfied with the overall sexual life and being in a stable relationship were factors associated with sexual intercourse during the COVID-19 pandemic. On the other hand, not drinking alcohol was considered a protective factor for sexual intercourse in this sample. Therefore, we believe that preventing the spread of coronavirus should involve recommendations for safe sexual practices in men, including aspects of each individual, such as sexual function and satisfaction, relationship status, and alcohol consumption.

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