

## **Satisfaction and sexual health of the Brazilian population: impacts of the COVID-19 pandemic**

**Satisfação e saúde sexual da população brasileira: impactos da pandemia da COVID-19**

**Satisfacción y salud sexual de la población brasileña: impactos de la pandemia de COVID-19**

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### **Abstract**

The present study investigated the factors associated with the negative impact of the COVID19 pandemic on the sexual lives of the Brazilian population. A cross-sectional study was conducted with the adult, sexually active Brazilian population using an online survey. 807 adults completed questionnaires on socioeconomic information, sexual life, emotional aspects, and sleep aspects during the period of social withdrawal. The perception of a satisfactory sex life decreased by more than 20% during the pandemic compared to before the quarantine in addition to which 73.4% of people experience pain or discomfort during or after intercourse. Sleep-related aspects also had a negative impact on sexual life where 79.1% had changes in sleep pattern and difficulty falling asleep or waking up during the night with difficulty going back to sleep represented risk factors for having an affected sex life. The perception of the sexual life of Brazilian individuals was affected by social distancing during the pandemic of COVID-19.

**Keywords:** COVID-19; Pandemic; Sexual health; Sexual satisfaction; Social distancing.

### **Resumo**

O presente estudo investigou os fatores associados ao impacto negativo da pandemia da COVID19 sobre a vida sexual da população brasileira. Foi realizado um estudo transversal com a população brasileira adulta e sexualmente ativa, utilizando uma pesquisa online. 807 adultos completaram questionários sobre informações socioeconômicas, vida sexual, aspectos emocionais e aspectos do sono durante o período de distanciamento social. A percepção de uma vida sexual satisfatória diminuiu mais de 20% durante a pandemia em comparação com antes da quarentena além que 73,4% das pessoas sentiram dor ou desconforto durante ou após o ato sexual. Os aspectos relacionados ao sono também tiveram um impacto negativo na vida sexual onde 79,1 % tiveram mudanças no padrão do sono e a dificuldade para adormecer ou acordar durante a noite com dificuldade para voltar a dormir representaram fatores de risco para ter a vida sexual afetada. A percepção da vida sexual dos indivíduos brasileiros foi afetada pelo distanciamento social durante a pandemia de COVID-19.

**Palavras-chave:** COVID-19; Pandemia; Saúde sexual; Satisfação sexual; Distanciamento social.

### **Resumen**

El presente estudio investigó los factores asociados al impacto negativo de la pandemia de COVID19 en la vida sexual de la población brasileña. Se realizó un estudio transversal con la población brasileña adulta y sexualmente activa mediante una encuesta en línea. 807 adultos completaron cuestionarios sobre información socioeconómica, vida sexual, aspectos emocionales y aspectos del sueño durante el periodo de retraimiento social. La percepción de una vida sexual satisfactoria disminuyó en más de un 20% durante la pandemia en comparación con antes de la cuarentena, además de que el 73,4% de las personas experimentaron dolor o molestias durante o después del coito. Los aspectos relacionados con el sueño también tuvieron un impacto negativo en la vida sexual, ya que el 79,1% tuvo cambios en el patrón de sueño y la dificultad para conciliar el sueño o despertarse durante la noche con dificultad para volver a dormir representaron factores de riesgo para que su vida sexual se viera afectada. La percepción de la vida sexual de los individuos brasileños se vio afectada por el distanciamiento social durante la pandemia de COVID-19.

**Palabras clave:** COVID-19; Pandemia; Salud sexual; Satisfacción sexual; Distanciamiento social.

## 1. Introduction

Brazil and the world experienced a public health emergency caused by the SARS-CoV-2 virus pandemic (Brasil, 2020). The virus displays a characteristic crown shape and belongs to the Coronaviridae family that results in the coronavirus disease (COVID-19) (Velavan et al., 2020). As the SARS-CoV-2 presents a high transmission, social distancing was the first effective control measure, as there was no antiviral medication available at the beginning of the pandemic (Brasil, 2020b).

Extreme measures of social distancing and domestic quarantine are strategies to prevent the spread of the virus (De Ferguson et al., 2020); however, the adoption of such measures also impacts on the daily activities of the population; for example, workers must adapt their jobs to the home office and schools were closed. These factors may also increase domestic and intrafamilial violence (Armitage & Nelluns, 2020).

However, in Brazil, social isolation evidenced most of the existing social inequalities, such as 40% of the Brazilian population living in informality with a contingent of more than 60 million people in a state of critical poverty, so the social isolation measures recommended by the government in Brazil had to take into account the livelihood of these groups in the pandemic period (IBGE, 2018). Despite the fact that Brazil has the support of the law 13.979/2020 that addresses the measures to confront the virus, there was a delay in the wide testing of the population and stricter isolation measures at the beginning of the pandemic (Silva, 2020).

The quarantine can be a negative experience for some individuals (Brooks et al., 2020). At other historical moments where quarantine was established to reduce the spread of other viruses, quantitative studies investigating psychological symptoms reported a high prevalence of psychological distress, such as emotional disorders (Mihashi et al., 2009), depression (Yoon et al., 2016), stress (Hawryluck et al., 2004), irritability, insomnia, and post-traumatic stress (Lee et al., 2005). Sexuality may also be affected by the quarantine. Indeed, social dynamics change during the self-isolation period, and this may also influence the way individuals experience their sexuality (Alphão & Filipe, 2020). Although sexuality is an essential aspect of human nature, the way individuals express and receive affection is not limited to coitus but is subject to the individuals' self-esteem (Sobecki-Rausch, Brown & Gaupp, 2017).

Regarding sexual health during the pandemic, the New York City Health Department released a booklet to guide residents on sexual issues during quarantine. The booklet stated that the safest method for sexual activity would only be through vaccination with at least one dose, since traces of the virus have been found in feces, sperm, and vaginal fluids. However, there is no evidence to prove transmission of COVID-19 through sexual contact, and the implementation of preventive measures (i.e. social distancing, distance of up to 2 meters between people, use of masks, and hand hygiene) may also have an impact on sexual activity. Given the current uncertainty, other ways to satisfy and contemplate sexuality are being emphasized in the manual (NYC, 2020).

In this context, although there is not enough research to prove the transmissibility of the virus through sexual intercourse as a primary driver, sexual intercourse develops in partners a sense of fear and guilt in the likelihood of being infected through relationships where there is the possibility of exchange of body fluids as well as the fear of transmitting the disease. Therefore, these two points are amplified when compared to other problems that negatively influence the continuity of sexual relations, such as family relationships, stress, financial concerns (Pascoal et al., 2021), in addition to the psychological problems that also impact the sexuality of individuals (Segev-Becker et al., 2020) In this context, this study aimed to conduct an online survey to investigate the factors associated with the negative impact of this period on the sexual life of the Brazilian population.

## 2. Methodology

This is a cross-sectional study with a quantitative approach. According to Pereira & Shitsuka (2018) the quantitative method uses statistics to verify and test study hypothesis's objective of the present study in verifying the impact of the pandemic on the sexual satisfaction of Brazilians. The study was approved by the Research Ethics Committee of the (UNILAB) (number CAAE: 31383120.7.0000.5576 and opinion No. 4,050,129) and followed the recommendations of the Resolution 466/12 of the National Health Council and the Declaration of Helsinki. As this study used an online survey, the informed consent form was replaced by the agreement to respond to all questions.

Data were collected in June 2020 using an online survey developed on Google Forms and disclosed on both social media websites and messaging applications of various academic and professional research groups in Brazil. Females, males and transgenders aging >18 years old, and with an active sexual life, namely engaging in sexual relations at the time of the study were included. Those who could not answer the questions due to cognitive impairments were excluded.

Given the extend of the study, the OpenEpi® online software version 3.01 was used for sample size calculation, verifying the need to apply 576 questionnaires. The following parameters were used for this calculation: (i) 95% confidence interval (95% CI), (ii) absolute precision of 5% with a maximum error of 5% for an infinite population, and (iii) design effect (Deff) of 1.5, estimating an anticipated frequency of 50% of individuals (i.e., opting for the largest sample size). A 20% percent was added to cover possible losses/outliers and confusion control, resulting in a representative sample of 807 adults.

The online survey consisted of 41 questions divided into four sessions related to the following information: (i) socioeconomic (age, place of living, education, ethnicity, occupation, monthly income, if the individual or the cohabitant had COVID-19, and if the individual remained in social isolation); (ii) sexual life (sexual orientation, fixed or multi-partner, duration with the same partner, if the social distance impacted on sexual life, as well as sexual life, desire, sexual arousal, orgasm, sexual satisfaction, and dyspareunia before and during the pandemic); (iii) emotional aspects (anxiety, fear, panic, excessive worry, and diagnosis of any anxiety disorder); and (iv) sleep during the social distancing period (insomnia, use of sleeping medication, average sleep hours, and change in bedtime, waking, and sleep pattern).

Data collected were stored in a Microsoft Excel® spreadsheet, and the statistical analysis was performed using the Statistic Package Social for Science® version 22 (SPSS, IBM). Pearson's X<sup>2</sup> (Chi-Square) or Fisher's Exact test was used, while binary logistic regression models were built to obtain the odds ratio (OR) and define the factors associated with the negative impact of the quarantine on sexual life. The 95% CI was also calculated, and a significance level of 5% was used for all analyses.

## 3. Results

Nine hundred and thirty-seven responses were obtained from the five geographical regions of Brazil. Eight hundred and seven responses were validated after the exclusion of duplicates. Through self-report, the prevalence of sexual life affected by social distancing was 54.9% (n = 443), and most were female (68,5%), white (51,9%), aging between 18 and 40 years (85%), who were working during the pandemic (76,1%), holding a graduate degree (51,9%), and with an income higher than five minimum wages (38,2%) (Table 1). A significant correlation was found between sexual life affected by social distancing and both schooling (p = 0.030) and working during the pandemic (p = 0.001).

**Table 1 - Personal and sociodemographic characteristics of the studied sample.**

Variables		Sexual life				Total	p-value
		Affected		Not affected			
		N	%	N	%		
Sex	Male	117	14.5	84	10.4	24.9	0.238
	Female	293	36.3	263	32.2	68.5	
	Not informed	33	4.1	20	2.5	6.6	
Age (years)	Between 18 and 40	382	47.3	304	37.7	85.0	0.283
	> 40	61	7.6	60	7.4	15.0	
Ethnicity	Black	36	4.5	30	3.7	8.2	0.538
	Brown	170	21.1	143	17.7	38.8	
	White	224	27.8	187	23.2	51.9	
	Indigenous	6	0.7	1	0.1	0.9	
	Eastern asian	3	0.4	2	0.2	0.6	
	Other	4	0.5	1	0.1	0.6	
Schooling	Complete primary education	1	0.1	0	0.0	0.1	0.030
	Incomplet high school	2	0.2	0	0.0	0.2	
	Complete high school	10	1.2	12	1.5	2.7	
	Technical education	4	0.5	7	0.9	1.4	
	Incomplete higher education	107	13.3	57	7.1	20.3	
	Complete higher education	94	11.6	94	11.6	23.2	
Work	Postgraduate	225	27.9	194	24.0	51.9	0.001
	Yes	312	38.7	131	16.2	76.1	
Income	No	302	37.4	62	7.7	23.9	0.231
	<1 minimum wage	15	1.9	6	0.7	2.6	
	1 to 3 minimum wages	144	17.8	106	13.1	31	
	3 to 5 minimum wages	117	14.5	111	13.8	28.2	
	> 5 minimum wages	167	20.7	141	17.5	38.2	

Source: Research data (2020).

Regarding the COVID-19 (table 2), most of the individuals (87.7%) and cohabitants (81.9%) neither had symptoms nor were not infected, probably a result of the social distancing (59.5%) (i.e., recommended prevention method). Those who respected the quarantine and did not have sexual relationships represent 70.2% of the participants. A significant correlation was found between sexual life affected by social distancing and Cohabitants with COVID-19 symptoms or confirmation ( $p = 0.036$ ) and Broke social distancing for sexual intercourse ( $p = 0.001$ ).

**Table 2 - Variables related to COVID-19 of the studied sample.**

Variables		Sexual life				Total	p-value
		Affected		Not affected			
		N	%	N	%		
COVID-19 symptoms or confirmation	Yes	58	7.2	41	5.1	12.3	0.431
	No	385	47.7	323	40.0	87.7	
Cohabitants with COVID-19 symptoms or confirmation	Yes	48	5.9	42	5.2	11.2	0.036
	No	355	44.0	306	37.9	81.9	
	Not applicable	40	5.0	16	2.0	6.9	
Remained socially distant	Yes	267	33.1	213	26.4	59.5	0.774
	No	28	3.5	21	2.6	6.1	
	Partially	148	18.3	130	16.1	34.4	
Broke social distancing for sexual intercourse	Yes	156	19.3	85	10.5	29.8	0.001
	No	287	35.6	279	34.6	70.2	

Source: Research data (2020).

Table 3 shows the affective and sexual aspects of the individuals, in which most were heterosexual (81.4%), married

or in a stable relationship (43.2%), and with a fixed sexual partner (75.3%) for 3-5 years (31.7%). Also, the relationship status of 92.9% of the sample did not change during the pandemic.

**Table 3 - Affective and sexual variables of the studied sample.**

Variables	Sexual life		OR (95% CI)	p-value	
	Affected	Not affected			
	N	N			
Sexual orientation	Heterosexual	339	318	1	0.003
	Homosexual	59	28	0.506 (0.315 – 0.814)	
	Asexual	2	1	0.533 (0.48 – 5.907)	
	Bisexual	41	17	0.442 (0.246 – 0.794)	
	Others	2	0	0.000 (0.000 – 0.001)	
Relationship type	Single	165	63	1	0.001
	Dating	151	74	1.284 (0.859 – 1.919)	
	Married or stable union	124	225	4.752 (3.303 – 6.837)	
	Widower	1	2	5.238 (0.467 – 58.78)	
	Others	2	0	0.000 (0.000 – 0.001)	
Change in relationship status during the pandemic	Yes	42	15		0.003
	No	401	349	2.437 (1.328 – 4.470)	
Fixed partner	Yes	302	306		0.001
	No	141	58	0.406 (0.288 – 0.573)	
Time with fixed partner	< 6 months	61	37	1	0.001
	Between 6 months and 1 year	88	66	1.236 (0.736 – 2.076)	
	Between 1 and 3 years	49	58	1.951 (1.117 – 3.410)	
	Between 3 and 5 years	108	148	2.259 (1.401 – 3.643)	
	> 5 years	137	55	0.662 (0.396 – 1.107)	

Legend: OR: odds ratio; 95% CI: 95% confidence interval. Source: Research data (2020).

The individuals who changed the relationship during the pandemic or were widower were 2.45-fold and 5.23-fold, respectively, more likely to have their sexual life affected during the pandemic, while a fixed sexual partner, and for more than five years, were protective factors for the impacts of the pandemic on sexual life.

Most individuals reported a satisfactory sexual life before the pandemic (79,1%) and reached orgasm in most cases (56%). With the pandemic, this perception decreased; however, the perception regarding sexual life (57.5%), sexual desire (41.6%), and sexual arousal (55.3%) did not change. Also, the orgasm was reached in most cases (38.5%), the degree of sexual desire or interest was classified as moderate (36,8%), and 73.4% of the sample felt pain or discomfort during or after sexual intercourse (Table 4). Both the perceived change in sexual life and the discomfort or pain during or after sexual intercourse negatively impacted on sexual life (OR 5.45 and 4.12, respectively) during the quarantine.

**Table 4 - Sexual life perception of the studied sample.**

Variables		Sexual life		OR (95% CI)	p-value
		Affected	Not affected		
		N	N		
Perception of sexual life before the pandemic	Satisfactory	343	295	0.802 (0.569 – 1.132)	0.209
	Unsatisfactory	100	69		
Reached orgasm before the pandemic	Yes, every time	151	154	1	0.057
	Yes, most of the time	263	189	0.705 (0.526 – 0.944)	
	No	29	21	0.710 (0.388 – 1.300)	
Changed the perception of sexual life during the pandemic	Yes	265	78	5.454 (3.987 – 7.474)	0.001
	No	178	286		
Sexual arousal during the pandemic	Yes, changed	202	244	1	0.001
	Yes, increased	160	78	0.404 (0.291 – 0.561)	
	No	81	42	0.429 (0.283 – 0.651)	
	Yes, every time	116	148	1	
Orgasm during the pandemic	Yes, most of the time	162	149	0.721 (0.519 – 1.002)	0.001
	No	165	67	0.318 (0.219 – 0.462)	
Degree of sexual desire or interest during the pandemic	Very low or none	23	13	1	0.001
	Low	63	30	0.842 (0.376 – 1.889)	
	Moderate	132	165	2.212 (1.079 – 4.532)	
	High	139	118	1.502 (0.729 – 3.095)	
	Very high	86	38	0.782 (0.358 – 1.705)	
Frequency of discomfort or pain during or after sex during the pandemic period	There was no relationship	130	36	1	0.001
	Always or almost always	6	9	4.127 (1.402 – 12.146)	
	Often	24	10	1.505 (0.659 – 3.433)	
	Few times	280	312	3.970 (2.653 – 5.939)	

Legend: OR: odds ratio; 95% CI: 95% confidence interval. Source: Research data (2020).

Conversely, a very high degree of sexual desire or interest and an increase in sexual arousal during the pandemic were protective factors (22% and 60% less likely to have their sexual life affected, respectively), which is in line with those who were satisfied with the sexual life before the pandemic.

Regarding sleep, most individuals reported a change in sleep pattern (79.1%), with 68.8% reporting difficulty to fall asleep, 66.4% waking up in the night and not being able to fall back asleep, and 72% unable to wake up at the same time as before the pandemic (Table 5).

**Table 5 – Variables related to sleep of the studied sample.**

Variables	Affected		OR (95% CI)	p-value	
	Yes	No			
	N	N			
Change in sleep pattern	Yes	378	260	2.326 (1.643 – 3.294)	0.001
	No	65	104		
Difficulty to fall asleep during this period	Yes	331	224	1.847 (1.367 – 2.495)	0.001
	No	112	140		
Woke up at night and had difficulty in falling back asleep	Yes	321	215	1.823 (1.357 – 2.449)	0.001
	No	122	149		
Woke up at the same time as before	Yes	101	122	0.586 (0.429 – 0.799)	0.001
	No	342	242		

Legend: OR: Odds ratio; 95% CI: 95% confidence interval. Source: Research data (2020).

The change in sleep pattern, difficulty to fall asleep, and waking up in the night with difficult to fall back asleep were identified as risk factors (OR 2,326; 95% CI (1,643 – 3,294)) and negatively impacted on sexual life during the quarantine. On the other hand, being able to wake up at the same time as before the quarantine was a protective factor (OR 0,706; 95% CI 0,519 – 0,961) against changes in sexual life during this period (Table 5).

#### 4. Discussion

The present study aimed to observe the impacts of the pandemic and social distancing on the sexual health of the Brazilian population. Most participants (54.9%) reported a change in sexual

The individuals who changed their relationship status during the pandemic period were 2.45 times more likely to have their sex lives affected, since although the changes in relationship status also occur in other contexts independent of a public health crisis, the social isolation caused by the coronavirus made it impossible for individuals to seek other partners in the same proportion that they would have if the sanitary restrictions of social distancing recommended by the government did not exist, while the perception of a satisfactory sex life decreased more than 40% during the pandemic compared to before the quarantine. Importantly, sleep-related aspects also had a negative impact on sex life.

The above-mentioned findings corroborate with Li et al (2020a), who showed that sexual activities and sexual satisfaction decreased in young individuals during the COVID-19 pandemic peak. The authors also found a 25% decrease in sexual desire, which is in line with the findings of the present study regarding the perception of sexual life during the pandemic. According to Mark, Vowels and Leistner (2020), unsatisfactory relationships are significant factors affecting the couples' sexual activities.

With the alarming situation, several life aspects were inevitably affected. Social restriction and uncertainties about health and financial issues affect the overall quality of life of the individuals (Wang et al., 2020). As sexuality is one of the cornerstones of the quality of life, it is easily understandable that the sexual life of many individuals was negatively impacted by quarantine.

In this study, a positive association was observed between holding a graduate degree and the pandemic impact on sexual life, which corroborates with an Italian survey, who observed associations between higher educational levels and reduced sexual activity and quality of life during the quarantine (Schiavi et al., 2020). Working during the quarantine was also associated with sexual life impairments, probably due to the uncertainties regarding the period. Self-isolation and uncertainties may involve an obsessive fear of contamination, discouragement, worry, anxiety, and depression (Brook et al., 2020).

In this sense, the present study showed that the presence of a fixed partner, and for more than three years, were protective factors for the quarantine impact on sexual life, which corroborates with the studies of Jacob et al (2020) and Maretti et al (2020), who showed that engaging in sexual activities with fixed and symptom-free partners, without suspicious or confirmed COVID-19 contamination, and living together from the beginning of the quarantine were considered a valuable tool to stay connected and relieve anxiety during the forced social distancing.

Among the single populations, a drastic decrease in sexual relations was noticed, as well as in the search for new relationships (Pascoal et al., 2021). Thus, among single individuals, research shows that the groups most affected within this perspective were the LGBTQI+ populations, people with chronic problems and functional diversities (Alarcão et al., 2019; Gato et al., 2020; 2018; Pereira et al., 2018; Platt et al., 2020; Santos et al., 2019; Suen et al., 2020).

On the other hand, it was observed a considerable increase in masturbatory activities, virtual sex, among other aspects developed by digital media that can trigger the misuse of technology (Lehmiller et al., 2020; Wind et al., 2020). In this sense, in addition to masturbation, the use of pornography triggered problems such as premature ejaculation (Li et al., 2020b; Pascoal et al., 2020) which were also observed in Brazilian research, where the single groups had a higher number of complaints about

sexual dysfunction and use of medications than the groups in stable relationships, also pointing out that these patients were not routine, i.e., they appear exclusively after the beginning of social distancing (Alves, 2020)

As shown by the expressive number of single individuals with affected sexual life, new sexual encounters with unusual partners are challenging during the quarantine. Also, the risk factors found (i.e., changed relationships or widower) indicates that strict physical restrictions directly impacts the possibility of new sexual partners and risky sexual behaviors (Jacob et al., 2020; Maretti et al., 2020).

In this study, the presence of dyspareunia negatively affected sexual life during the quarantine. The Italian Society of Andrology (Maretti et al., 2020) points out that individuals experiencing the current social distancing are more likely to report discomfort and pain during intercourse, mainly due to fear, disappointment, and anxiety (Aversa & Jannini, 2020).

The presence of a very high degree of sexual desire during the pandemic and increased sexual arousal were protective factors for a good sexual life. It is known that sexual desire below expectations is a clinical condition that negatively affects well-being, quality of life, and relationships. Low sexual desire can involve a lack of motivation or interest in sexual activity and can be superimposed on the sexual arousal reduction (Zheng et al., 2020).

Our findings also demonstrated that changes in sleep patterns affected sexual life during the pandemic; however, similar to those who maintained the sleep pattern, they seemed to complain less about sexual problems. Scientific data have shown that insomnia, sleep loss, and poor sleep quality were common complaints during the quarantine. Furthermore, any stressful event in life, whether related to personal issues or major disasters threatening physical or psychological health, may lead to sleep disorders (Morin et al., 2020). The study performed by Palagini et al (2016) hypothesized that sleep disorders activate systems related to stress and inflammation, which may explain the high sleep disorders prevalence with pain and emotional and psychological problems. There is a direct relationship between low sleep quality and sexual dissatisfaction (Amasyali et al., 2016; Khoshbin et al., 2008; Jankowski et al., 2008), corroborating the results of this study.

Data regarding sexual life behaviors during the pandemic with large sample sizes are scarce in the literature. Although the sample size is the main study strength, some limitations must be acknowledged. Firstly, the cross-sectional design did not allow the determination of a causal relationship. Secondly, it was not possible to use a validated questionnaire restricted to men or women since no limitations regarding sex were imposed. Despite these limitations, a very relevant aspect of individuals' lives impacted by the SARS-Cov-2 pandemic was studied during the highest mortality and spread rate period in Brazil. Furthermore, given the extend of the country, we were able to reach individuals from all five Brazilian regions.

## 5. Conclusion

The sexual life perception of Brazilian individuals was affected by social distancing during the COVID-19 pandemic, a period marked by acute stress and uncertainties. Although sexual activity is not the main concern during this period, it is an aspect that influences the quality of life and, therefore, deserves attention.

The present study creates a paradigm for new studies on sexual satisfaction that seek to associate it with other variables of quality of life and sexual health, becoming a tool to be used and strengthened in the context of the pandemic of COVID-19 and, consequently, the integral care of the individual in facing the disease.

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