

COVID-19, quarantine and sexual life: a cross-sectional online survey of Brazilian individuals

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ABSTRACT

Introduction: The COVID-19 outbreak was responsible for a high number of deaths worldwide. Not only the physical health was affected by COVID-19. Thus, to avoid the infection spreading, social distancing and quarantine have been adopted, bringing rupture to previous habits, economic losses, and isolation. **Objective:** To study the sexual life during the COVID-19 pandemic in Brazilian individuals. **Methods:** This cross-sectional study using an internet survey was conducted from June 10th to July 30th, 2020 with epidemiological questions, questions on fatigue and depression, and the sexual quotient scale (SQS). **Results:** The survey was answered by 2,131 individuals: 325 males, median age 25 years (IQR=22.0-33.5 years), range between 18 to 69 years and 1,806 females with median age 25 years (IQR=22-31 years), range between 18 to 67 years. In 49% of males and 29% of females (29%), there were no changes in sexual life. In 43.7% of females and 32.1% of males, some deterioration was observed while in 26.3% of females and 18.1% some improvement was noted. Despite this, 90.8% of males and 85% of females scored as having good sexual performance according to SQS. Sexual performance was negatively influenced by fatigue, state of mind in males and females; having a fixed partner and staying at home impaired male performance. **Conclusion:** Despite the pandemic, the studied sample showed good sexual performance in the studied period.

Keywords: sexuality; pandemic; COVID-19; depression; mental health.

INTRODUCTION

The COVID-19 outbreak was recognized by the World Health Organization (WHO) as a pandemic in March 2020¹. The coronavirus or SARS-CoV-2 is an RNA virus that affects primarily the respiratory system and causes a wide range of symptoms that go from a common cold to severe acute respiratory syndromes². It has been responsible for a high number of deaths worldwide².

Not only the physical health was affected by COVID-19. So far, no drug can be considered effective against it. Thus, to avoid the infection spreading, social distancing and quarantine have been adopted, bringing rupture to previous habits, economic losses, and isolation. Fear of contamination and of the loss of one's own

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life or that of loved ones bring additional stress and contribute to anxiety and depression.

In Brazil, contradictory orientations by government agencies contributed to poor control of the disease spreading, and Brazil became one of the countries severely affected by the pandemic. Until June 2021, more than 500,000 deaths were reported with a mortality rate of 241.3/100,000³ with huge financial, social, and psychological losses.

The literature observes that confinement may have serious psychological effects in cases of incarceration, long periods in submarines, and during some expeditions causing tedium, sleep deprivation, and stress. Depression, anxiety, suicidal behavior, post-traumatic stress disorder, and domestic violence have also been observed in such context⁴. Nevertheless, the real impact of isolation procedures implemented during the COVID-19 pandemic is not known. An analysis of 500 individuals from Hong Kong done during the pandemic showed that depression was present in 19% and anxiety in 14%, numbers considered much higher than those from previous studies (13.5% for depression and 4.6% for anxiety). In this same work, 25.4% stated that their mental status had declined with the pandemic⁵. Another, in a sample of 976 adults from Spain, observed that there was an increase in the levels of stress, anxiety, and depression in this population and that these findings were worse in the young people⁶.

The individual's sexual life may be affected throughout the pandemic as psychiatric disorders are some of the most important risk factors for sexual dysfunction. Depression has been linked to low sexual desire; anxiety was associated with the lack of subjective arousal and pleasure, to orgasmic difficulties, and sexual pain⁷. Also, preventing measures such as closing public spaces and reinforcing the need for social distancing bring difficulties in meeting a partner or dating and further impair the sexual life.

To recognize and treat sexual dysfunction is important not only to improve an individual's sexual life but also their overall satisfaction with life. It is also known that sexual dysfunction may also affect the wellbeing of the partners⁸.

Herein we aimed to evaluate the modification of sexual habits in a sample of Brazilian individuals during the COVID-19 pandemic period hypothesizing that this situation may have hurt sexual life. In this context, we also studied the influence of fatigue, perception of mental status alterations, and having or not a fixed partner.

METHODS

Participants and design

This cross-sectional study was approved by the local Committee of Ethics in Research under protocol number 4.049.802 from May 26th, 2020. An internet survey was conducted from June 10th to July 30th, 2020, through social media (Facebook, Instagram,

and WhatsApp groups) to individuals over 18 years of age of both genders. The sample included 2,131 individuals: 325 males and 1,806 females.

Ethics

All procedures performed in studies involving human participants were by the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

This study was approved by the Committee of Ethics in Research from Evangelic Mackenzie School of Medicine under protocol number 4.049.802 from May 26th, 2020.

Instrumentation

After consent, the participant answered epidemiological questions, queries on quarantine, behavior, and sexual habits. The questions included an analogic visual scale on fatigue (that goes from 0-10, where 0 means no fatigue and 10 the worst scenario), questions on the perception of "feeling depressed" (Yes/No question), perception of changes in sexual performance during pandemic (answered on a Likert scale from much worse, worse, unchanged, better and much better) and questions on sexual behavior that included several partners, presence of fixed sexual (Yes/No question) and practicing virtual sex (Yes/No question).

Males and females filled the validated Sexual Quotient Scale (SQS) in Portuguese. This questionnaire - male and female versions - were developed in the Sexuality Studies Program of the Institute of Psychiatry of Hospital das Clínicas, School of Medicine, University of Sao Paulo - Brazil^{9,10}. It has ten questions that approach emotional and functional elements related to the sexual performance/satisfaction of each gender. The female questionnaire contains ten questions on desire and sexual interest, preliminaries, woman's excitement and harmony with the partner, comfort during sexual intercourse, orgasm, and sexual satisfaction. Its internal intra-observer (Chronbach alpha) consistency of the several domains oscillated from moderate to strong (0,791 to 0,911) and the interobserver consistency varied from 0,791 to 0,914. The English translation for the questions of the SQS - female version are shown in Table 1.

The male questionnaire has ten questions on trust, preliminaries, satisfaction with the partnership; quality of the erection; ejaculatory control; ability to achieve orgasm, and satisfaction with sexual intercourse. The English translation for the questions of the SQS - male version are shown in Table 2.

Each item of both male and female SQS is answered on a scale graded from 0-5 based on frequency and level of satisfaction, with 0 indicating "never" and 5 indicating "always;" thus, higher scores indicate greater sexual satisfaction. For the composition of the scores, the sum of all points attributed to each question is calculated, multiplying the total result by 2, resulting in a final score based on a 100-point scale. In the female SQS, question number

Table 1: Sexual Quotient Scale - Female Version*

1. Do you normally think spontaneously about sex, remember sex or imagine yourself having sex?
2. Is your interest in sex sufficient for you to take part in sexual relations enthusiastically?
3. Does foreplay (caressing, kisses, hugs, fondling, etc) stimulate you to continue the sexual relationship?
4. Do you normally get lubricated (wet) during sexual relations?
5. During sexual relations, as your partner becomes more aroused, do you also feel more stimulated for sex?
6. During sexual relations, do you relax your vagina sufficiently to facilitate the penetration of the penis?
7. Do you normally feel pain during sexual relations when the penis penetrates your vagina?
8. Are you able to get involved without getting distracted (without losing concentration) during sexual relations?
9. Are you able to reach orgasm (maximum pleasure) in the sexual relations you have?
10. Does the level of satisfaction you get from sexual relations make you want to have sex again on other days?

*Questionnaire was applied in Portuguese. English translation has not been validated.

Table 2: Sexual Quotient Scale- Male version*

1. Is your desire high enough to encourage you to initiate sexual intercourse?
2. Do you feel confident in your ability to seduce?
3. Do you feel that foreplay is enjoyable and satisfying for both you and your partner?
4. Is your sexual performance affected by your partner's sexual satisfaction?
5. Can you maintain an erection sufficiently to complete the sexual activity satisfactorily?
6. After sexual stimulation, is your erection hard enough to ensure satisfying intercourse?
7. Are you able to consistently obtain and maintain an erection whenever you have sexual activity?
8. Are you able to control ejaculation so that sexual activity lasts as long as you want?
9. Are you able to reach orgasm during sex?
10. Does your sexual performance encourage you to enjoy sex more frequently?

*Questionnaire was applied in Portuguese. English translation has not been validated.

seven must be transformed before this calculation, as it goes in the reverse direction, according to the following form: $Q7 \text{ reverse} = 5 - Q7$, as indicated by Abdo^{9,10} in her study. Incomplete questionnaires were excluded.

Values from 82-100 points are considered as excellent sexual performance, from 62–80 points a very good performance, 42 -60 points – good performance, from 22-40 points fair performance, and from 0-20 points poor performance.

Data analysis

Data was collected in frequency and contingency tables. Data distribution was studied by the Shapiro Wilk test and the central tendency of numerical variables (SQS of males and females) was expressed in median and interquartile range (IQR). Comparison of

nominal data (having a fixed sexual partner, feeling tired or depressed during a pandemic, perception about changes in sexual behavior during a pandemic) and categorical data (monetary income, level of education, degree of isolation) was done by chi-squared tests. The comparison of QS of males and females according to perceptions of feeling tired, depressed, and having a fixed sexual partner were done by the Mann-Whitney test. Comparison of QS of males and females according to categories of education, monetary income, and educational level were done by the Kruskal Wallis test with Dunn's multiple comparison tests when needed. Bonferroni correction was used to calculate p significance. The software Graph Pad Prism, version 6.00 for Windows (GraphPad Software, La Jolla, California, USA) was used for statistical analysis.

RESULTS

The survey was answered by 2,131 individuals: 325 males, median age 25 years (IQR=22.0-33.5 years, range between 18 to 69) and 1,806 females with median age 25 years (IQR=22-31 years, range between 18–67 years). The description and comparison of epidemiological data of these two groups are in Table 3. There it is possible to note that most of the responders were females, students, that homosexuality was more common in males, and that the studied sample had a good educational level.

Table 4 shows individuals' behavior and mental health perception during the pandemic in the studied sample as well as a comparison between males and females. This table shows that females more than males were affected by fatigue and notice that mental health and sexual behavior have changed. Women stayed more at home. The number of males who have virtual sex was significantly higher than females; however, there was no significant increase during the pandemic in both genders. Most males and females stated having no fear of having an intimate relationship after the pandemic.

Figure 1A demonstrates the results of the visual analogic scale from 0 to 10 of the perceived state of mind during a pandemic. The median value was higher in males () than in females (6.0 IQR=4.0-7.0 vs 5.0 IQR=4.0-7.0; $p < 0.0001$). Figure 1B shows the perception of changes in several domains of daily life during the pandemic. It displays that the most affected domain was emotional for both males and females and that there were differences between males and females in all studied aspects but financial.

Figure 2A illustrates how individuals with a fixed sexual partner perceived changes in their sexual life during the pandemic. It displays that almost half of the male sample and almost 1/3 of the female sample did not perceive any changes. In 32.1% of males and 43.7% of females, this variation was for worse and in 18.1% of males and 26.3% of females, it was for better. Figure 2B displays the results of SQS in males and females during the pandemic, showing that most of the sample (90.8% of males and 85% of females) had a moderate to good and good to excellent performance according to SQS.

Table 3: Clinical and sociodemographic data of studied sample (n=2,131) comparing males and females.

Parameter	Males n (%)	Females n (%)	p-value*
	n=325	n=1,806	<0.0001
Gender identity			
Male	324	6	
Female	1	1,800	
Sexual orientation			
Heterosexual	251 (77.2)	1,581 (87.5)	<0.0001
Homosexual	52 (16)	43 (2.4)	
Bisexual	22 (6.8)	161 (8.9)	
Pansexual	0	14 (0.7)	
Occupation			
Student	146 (44.9)	681 (37.7)	0.005
Autonomous	41 (12.6)	205 (11.4)	
Health worker	26 (8)	290 (16)	
Public servant	32 (9.8)	145 (8)	
Commerce	17 (5.3)	77 (4.3)	
Industry worker	16 (4.9)	85 (4.7)	
Unemployed	7 (2.1)	64 (3.5)	
Others	40 (12.4)	259 (14.4)	
Tobacco			
No	280 (86.1)	1,713 (94.8)	<0.0001
Yes	45 (13.9)	93 (5.2)	
Alcohol use			
No	178 (54.8)	1,169 (64.7)	0.0006
Yes	147 (45.2)	637 (35.8)	
Monthly income in minimum wages			
None	46 (14.2)	274 (15.2)	0.34
Until one	20 (6.1)	162 (8.9)	
Until 3	77 (23.7)	404 (22.4)	
3 or more	182 (56)	966 (53.5)	
Schooling			
High school	18 (5.5)	163 (9)	0.005
College (Incomplete)	150 (46.3)	660 (36.6)	
College (Complete)	71 (21.9)	439 (24.5)	
Post-graduation	85 (26.3)	538 (29.9)	
Menopause		68 (3.8)	
Contraception method			
Pill		637 (35.3)	
Male condom		333 (18.4)	
Hormonal IUD		206 (11.4)	
Copper IUD		103 (5.7)	
None		368 (20.4)	
Other		149 (8.8)	

Bonferroni p correction=0.01;

(*) Qui-Square test; n= number; IUD= intrauterine device.

Table 3 shows the median values of the SQS in males and females according to the studied variables (having a fixed sexual partner, the influence of perception of altered mood and mental status, tiredness). It demonstrates the importance of mental status and the presence of fatigue in sexual performance in the whole sample; having a fixed sexual partner was important for males but not females.

The influence of monetary income and educational levels on sexual performance during the pandemic is in Table 5; no influence of these variables on sexual performance could be detected. The degree of isolation influenced male but not female sexual life.

Table 4: Behavior during the isolation due to pandemic comparing male and female.

Parameter	Males n (%)	Females n (%)	p-value*
	n=325	n=1,806	
Sexual partner			
Fixed	202 (62.1)	1,308 (72.4)	0.031
Non-Fixed	123 (37.8)	498 (27.6)	
Non-regular partners in the last week			
0	89 (27.4)	402 (81.2)	<0.0001
1	17 (13.8)	75 (15.1)	
2	11 (8.9)	16 (3.2)	
3	6 (4.9)	2 (0.5)	
Fixed sexual partner living together			
Yes	117 (57.9)	651 (49.8)	0.0002
No	85 (42.1)	657 (50.2)	
In comparison to pre-pandemic are you depressed and/or with affected mental health?			
Yes	151 (46.5)	1,253 (69.4)	<0.0001
No	174 (53.5)	553 (30.6)	
Are you feeling very tired?			
Yes	190 (58.5)	1259 (69.7)	<0.0001
No	135 (41.5)	547 (30.3)	
Has your way of relating sexually changed?			
Yes	206 (63.4)	1,303 (72.1)	0.0014
No	119 (36.6)	503 (27.9)	
Do you practice virtual sex/send nudes?			
Yes	128 (39.4)	526 (29.1)	0.0002
No	197 (60.6)	1280 (70.9)	
Did you practice sex/send nudes before the pandemic?			
Yes	136 (41.8)	542 (30)	0.030
No	189 (58.2)	1,264 (70)	
Will you be afraid to have an intimate relationship after the pandemic?			
Yes	41 (12.6)	286 (15.8)	0.13
No	284 (87.4)	1,520 (84.2)	
Degree of isolation			
Not leaving the house for the last month	60 (18.5)	375 (20.8)	<0.0001
I go out minimally but I don't work	158 (48.6)	1,004 (55.6)	
I leave frequent and work in the health service	17 (5.2)	148 (8.2)	
I leave home frequently and work with COVID patients	24 (7.4)	92 (5.1)	
I leave home frequently and work with the general public	66 (20.3)	187 (10.3)	

Bonferroni correction p=0.005

*Qui-Square test, n=number;

DISCUSSION

Our results have shown that most of our responders adopted isolation during the pandemic, not leaving home or doing it minimally. They also showed that this population did perceive changes in sexual life during this period: in 32.1% of males and 43.7% of females the sexual life deteriorated and in 18.1% of males and 26.3% of females it improved according to their perception. Despite this, the results of males and females in the SQS showed that 90.8% of males and 85% of females had a moderate to good and good to excellent performance according to the SQS scores. Unluckily we do

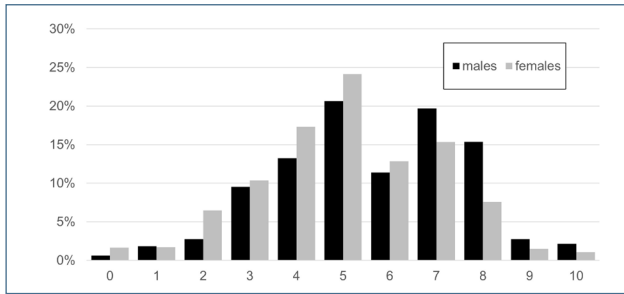


Figure 1A: “On a scale from 0 (very discouraged) to 10 (very excited) how do you rate your state of mind during the pandemic compared to the pre-pandemic period?”

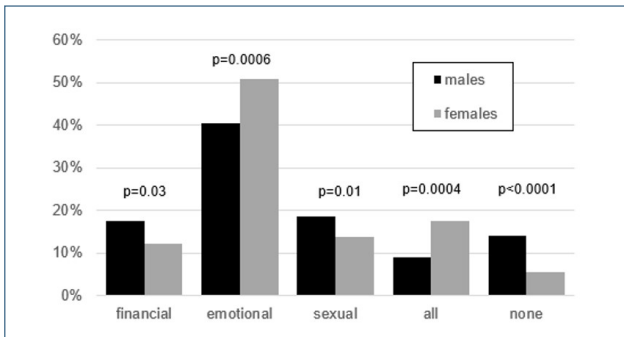


Figure 1B: “What aspect is the most affected by pandemic?” (Bonferroni correction $p=0.01$)

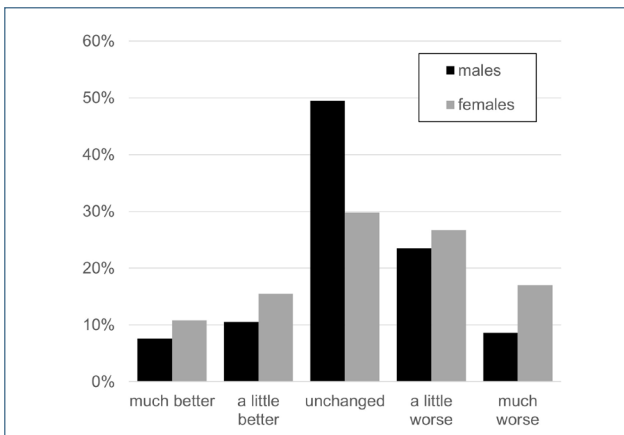


Figure 2A: “In the case of a fixed partner, how is your sex life during a pandemic?” (male vs females $p < 0.0001$).

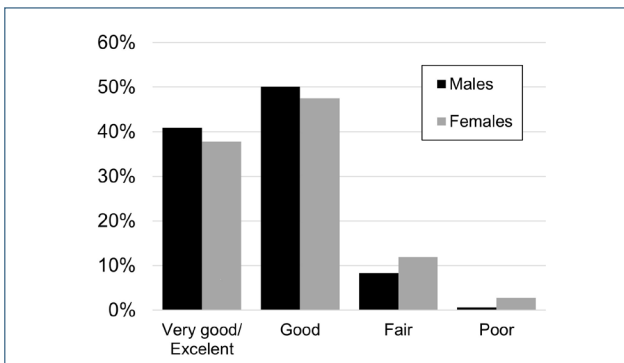


Figure 2B: Comparison of SQS (Sexual quotient scale) results in males and females according to categories, showing that males had higher scores than females ($p=0.04$).

not have data before the pandemic for comparison. Likewise, we could not find results from other studies to establish a comparison as most of them, using the present scale (SQS), were not done in the general population but limited to a special situation or a specific disease. It is important to use the same instrument to evaluate sexual performance to establish a correct comparison as it is known that they may affect the results¹¹.

In this sample, a variable that affected sexual life in both sexes was “feeling depressed”, showing that this is one of the points to be addressed to improve ones’ sexual life. Salary and educational level did not have any impact. Risk factors for depression comprise a mixture of genetic and environmental components, such as family history and stressful environment¹². Females seem to be more vulnerable than males in this context. Depression and tiredness were more common in females than males; females more than males perceived changes in their sexual life. In addition, antidepressant drugs used as treatment could play a role in diminishing the libido for some people¹².

Association between sexual performance and mental health has been stressed by others¹². Chronic stress is associated with rising levels of endogenous cortisol, which can promote a decrease in gonadal steroids and adrenal androgens that have facilitating effects on sexual desire and genital arousal^{13,14}. Kissinger et al.¹⁵ studying females after the hurricane Katrina disaster observed that the frequency of intercourse decreased. Hamilton et al.¹⁶ studying females with chronic stress showed that stress was associated with lower levels of genital sexual arousal response due to both psychological and hormonal factors. A study done during the COVID-19 pandemic, in 89 Italian females, showed that quarantine negatively influenced the sexual function in women who live with their sexual partners¹⁷. On the other hand, another study in 58 females from Turkey found that sexual desire and frequency of intercourse increased during the COVID-19 pandemic, but that the quality of sexual life decreased¹⁸. Staying at home could improve desire but worrying about the pandemic and related aspects may imply alterations of the mood that may lead to a decrease in the quality of sexual life. In our findings, the degree of isolation was important only in males: those not leaving home performed worse than those going out regularly. We could not find any explanation for the differences, but we can hypothesize that in a patriarchal society like ours, staying at home could interfere with males’ sense of independence, harming the self-image and self-confidence and impairing sexual performance. It is also interesting to note that males without a fixed sexual partner performed better than those with a fixed partner.

In the present study, it was also found that fatigue impaired sexual function in both men and women and this complaint was more common in women (69.7%) than men (58.5%). In the general population, fatigue has been considered the most common reason for the loss of sexual desire¹⁹. Physical and psychological fatigue appearance during pandemic has been considered to be related to preventive limitations of movement and exercise as well

as fear and anxiety²⁰. We can also believe that this symptom was more common in women due to workload that increased during this period because of the need for children's education at home and housework that increased with pandemic restrictions.

The studied sample did not represent the Brazilian population in general as we have a highly educated sample with good economic resources. This may have had a role in the decision to adopt isolation and in not having economic concerns. Nevertheless, for this population range, this survey shows that sexual life has deteriorated during the pandemic and that depression was the main associated variable. In Brazil, the internet is not available for the lower-income classes, so this may explain the present selection bias. In addition, people with low schooling may have had difficulties answering the questions, and the failure to complete the internet presented form did

not allow such individuals to submit the answers to the program. Another limitation of this study is its transversal design that does not allow to compare the present results with those before the pandemic.

Concluding, in this study during the COVID-19 pandemic, the studied sample showed moderate to good sexual performance according to the sexual quotient scale. In 43.7% of females and 32.1% of males, some deterioration in sexual life was observed while in 26.3% of females and 18.1% some improvement was noted. Sexual performance was influenced by fatigue, state of mind in both: males and females; having a fixed partner and staying at home impaired the male performance. Feeling depressed was associated with the worst performance in sexual life displaying that this is one of the facts to be addressed to improve ones' sexual life. Salary and educational level did not have any influence.

REFERENCES

- Maretti C, Privitera S, Arcaniolo D, Cirigliano L, Fabrizi A, Rizzo M, et al. COVID-19 pandemic and its implications on sexual life: recommendations from the Italian Society of Andrology. *Arch Ital Urol Androl.* 2020;92(2). <https://doi.org/10.4081/aiua.2020.2.73>
- Hartenian E, Nandakumar D, Lari A, Ly M, Tucker JM, Glaunsinger BA. The molecular virology of Coronaviruses. *J Biol Chem.* 2020;295(37):12910-34. <https://doi.org/10.1074/jbc.REV120.013930>
- Brasil. Ministério da Saúde. Sistema Único de Saúde (SUS). Corona vírus. Available from: <https://covid.saude.gov.br/>
- Mengin A, Allé MC, Rollind J, Ligier F, Schroderf C, Lalanhe L, et al. Psychopathological consequences of confinement. *Encephale.* 2020;46(3S):S43-52. <https://doi.org/10.1016/j.encep.2020.04.007>
- Choi EPH, Hui BPH, Wan EYF. Depression and anxiety in Hong Kong during COVID-19. *Int J Environ Res Public Health.* 2020;17(10):3740. <https://doi.org/10.3390/ijerph17103740>
- Ozamiz-Etxebarria N, Dosal-Santamaria M, Picaza-Gorrochategui M, Idoiaga-Mondragon N. Stress, anxiety, and depression levels in the initial stage of the COVID-19 outbreak in a population sample in northern Spain. *Cad Saude Publica.* 2020;36(4):e00054020. <https://doi.org/10.1590/0102-311X00054020>
- Basson R, Gilks T. Women's sexual dysfunction associated with psychiatric disorders and their treatment. *Women's Health.* 2018;14:1745506518762664. <https://doi.org/10.1177/1745506518762664>
- Abdo CH. The male sexual quotient: a brief, self-administered questionnaire to assess male sexual satisfaction. *J Sex Med.* 2007;4(2):382-9. <https://doi.org/10.1111/j.1743-6109.2006.00414.x>
- Abdo CHN. Elaboração e validação do quociente sexual - versão feminina: uma escala para avaliar a função sexual da mulher. *Rev Bras Med.* 2006;63(9):477-82.
- Abdo CHN. Elaboração e validação do quociente sexual - versão masculina, uma escala para avaliar a função sexual do homem. *Rev Bras Med.* 2006;63(1-2):42-46.
- Hayes RD, Dennerstein L, Bennett CM, Fairley CK. What is the "true" prevalence of female sexual dysfunctions and does the way we assess these conditions have an impact? *J Sex Med.* 2008;5(4):777-787. <https://doi.org/10.1111/j.1743-6109.2007.00768>
- Mollaioli D, Ciocca G, Limoncin E, Di Sante S, Gravina GL, Carosa E, et al. Lifestyles and sexuality in men and women: the gender perspective in sexual medicine. *Reprod Biol Endocrinol.* 2020;18:10. <https://doi.org/10.1186/s12958-019-0557-9>
- Gore AC, Attardi B, Franco DB. Glucocorticoid repression of the reproductive axis: effects on GnRH and gonadotropin subunit mRNA levels. *Mol Cell Endocrinol.* 2006;256(1-2):40-8. <https://doi.org/10.1016/j.mce.2006.06.002>
- Izawa S, Saito K, Shiotsuki K, Sugaya N, Nomura S. Effects of prolonged stress on salivary cortisol and dehydroepiandrosterone: a study of a two week teaching practice. *Psychoneuroendocrinology.* 2012;37(6):852-8. <https://doi.org/10.1016/j.psyneuen.2011.10.001>
- Kissinger P, Schmidt S, Sanders NS, Liddon N. The effect of the hurricane Katrina disaster on sexual behavior and access to reproductive care for young women in New Orleans. *Sex Transm Dis.* 2007;34(11):883-6. <https://doi.org/10.1097/OLQ.0b013e318074c5f8>
- Hamilton LD, Meston CM. Chronic stress and sexual function in women. *J Sex Med.* 2013;10(10):2443-54. <https://doi.org/10.1111/jsm.12249>
- Schiavi MC, Spina V, Zullo MA, Colagiovanni V, Luffarelli P, Rago R, et al. Love in the time of COVID-19: Sexual function and quality of life analysis during the social distancing measures in a group of Italian reproductive-age women. *J Sex Med.* 2020;17(8):1407-13. <https://doi.org/10.1016/j.jsxm.2020.06.006>
- Yuksel B, Ozgor F. Effect of the COVID-19 pandemic on female sexual behavior. *Int J Gynaecol Obstet.* 2020;150(1):98-102. <https://doi.org/10.1002/ijgo.13193>
- Holloway V, Wylie K. Sex drive and sexual desire. *Curr Opin Psychiatry.* 2015;28(6):424-9. <https://doi.org/10.1097/YCO.0000000000000199>
- Morgul E, Bener A, Atak M, Akyel S, Aktaş S, Bhugra D, et al. COVID-19 pandemic and psychological fatigue in Turkey. *Int J Soc Psychiatry.* 2021;67(2):128-35. <https://doi.org/10.1177/0020764020941889>