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Impact of COVID-19 on the sexual function and self-esteem of young Brazilian undergraduate students

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ABSTRACT

Introduction: Satisfactory sexual function contributes considerably to women's physical and mental health and is affected by several factors, including chronic stress. Since the beginning of the COVID-19 pandemic, these stressors have been intensified by fear of contamination and morbidity and mortality, deaths, and long-term social isolation. **Objective:** To evaluate the effect of the COVID-19 pandemic on the sexual function and self-esteem of young women attending university in Brazil and also investigate the importance of social isolation in these conditions. **Methods:** This longitudinal study included 90 students with active sexual life who answered questionnaires before (in person) and during (virtually) the pandemic. The instruments used were the Female Sexual Function Index (FSFI) and the Rosenberg Self-Esteem Scale. **Results:** Only 67 women answered all questionnaires sent during the pandemic and had a mean age of 22.9 (±2.99) years; most of them were eutrophic, healthy students and, had a fixed partner. The total FSFI score allowed us to classify women without sexual dysfunction and was not modified during the pandemic. On the other hand, the self-esteem found was slightly lower than that considered healthy and did not change during the pandemic. Women who maintained social distancing showed a statistically significant reduction in sexual function when compared to those who did not (p=0.003). **Conclusion:** The COVID-19 pandemic did not influence young women's sexual function or self-esteem attending university in Brazil. However, the behavior of social isolation during the pandemic impaired the sexual function of these women.

Keywords: sexuality; women; universities; COVID-19.

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INTRODUCTION

Sexual function is a fundamental aspect of humans, is influenced by several factors, and is strictly related to the quality of life. According to World Health Organization (WHO), sexual health is "a state of complete physical, mental and social well-being concerning sexuality"[1]. While sexual satisfaction is considered the result of a healthy sexual life, regarding a sexual right and is one of the main reasons to engage in sexual activity[2].

Furthermore, the human sexual response cycle can be described in five phases: arousal, plateau, orgasm, and resolution[3]. Chronic stress, proven by high cortisol levels, affects a woman's sexual function, especially in the excitation phase[4]. This phase is characterized by a generalized organic reaction of myotonia, vasocongestion of both the local genital vessels and the skin, and vaginal lubrication[5].

According to Holgado et al.[6], the stress experienced in the academic environment is the sum of several factors and can trigger anxiety. Among these factors stand out the tests and evaluations, the pressure of the family to be a distinguished graduate, teacher's demands, school work deadlines, relationship problems, and the distance from the family environment.

Added to this context is the pandemic declared by the WHO in February 2020, originated by the SARS-CoV-2 virus (new coronavirus), which had its initial manifestation in Wuhan, Hubei Province – China – in December 2019. To cope with the new coronavirus, specific guidelines for the reduction of contagiousness were determined by the WHO but also favored academic stress[7]. Radical changes in the lifestyle of university students due to the restriction of social interactions, confinement, and fear of infection have had a significant impact, increasing vulnerability to mental health problems[8]. In addition, confinement may have negatively influenced self-esteem, a condition that refers to the individual's thinking and feeling towards himself and may affect several aspects of life experience, including love and sexual relationships[9].

During the current pandemic scenario, different studies have evaluated women's sexuality during social isolation in several countries, such as Italy[10], Poland[11], the United States[12,] and Turkey[13], investigating the most diverse aspects. The results pointed to changes in the sexual behaviors of women that have varied from the interruption in the use of contraceptives[14] to the decrease in frequency and sexual satisfaction[10,11].

Regarding female sexual function, one of the most commonly used questionnaires in scientific research is the Female Sexual Function Index (FSFI), which assesses multiple aspects of sexuality[15]. To assess self-esteem, the Rosenberg Self-Esteem Scale[16] is used worldwide and was adapted and validated in Brazil by Hutz[17]. The possibility of using these instruments from virtual platforms allowed and facilitated the collection of information on this theme.

Several studies in the literature have evaluated the impact of the pandemic caused by the new coronavirus on women's sexual function, but few have been done with this population group. In addition, no studies have been found in the literature that has evaluated the effect of the pandemic on women's self-esteem.

Thus, this study aimed to evaluate the effect of the pandemic on the sexual function and self-esteem of young Brazilian undergraduate students and to investigate the importance of social isolation in these conditions.

METHODS

This is a cross-sectional observational study. The data used for the period before the pandemic were collected in person in a regular research project funded by the São Paulo State Research Support Foundation (FAPESP) (number 2019/09328-5), conducted between January 2019 and the beginning of March 2020 at the Federal University of São Paulo. After the beginning of the pandemic, the same volunteers from the previous project were contacted again for this study, which was approved by the Research Ethics Committee of the Federal University of São Paulo under opinion number 4,537,539. Data during the pandemic were collected virtually through the platform Google between February and March 2021.

The response variable considered for the sample sizing was calculated according to the study of Yuksel and Ozgor[13], and an established difference of 2.5 points was considered in the mean FSFI before and during the pandemic and the standard deviation of 6.8 points. The dimension required to obtain power greater than 0.80 and a significance level of 0.05, the minimum sample size should be 60 individuals.

We included Brazilian university student women living in the state of São Paulo, from 19 to 30 years old, with a sexually active life in the last four weeks. Those who did not answer at least one question from one of the questionnaires applied, those diagnosed with COVID-19 at some point, or who presented neurological or mental conditions that made it impossible to understand the questionnaires, were excluded.

Between January 2019 and January 2020, after signing the written informed consent form, three questionnaires were administered in person: sociodemographic and general health data, the FSFI, and the Rosenberg Self-Esteem Scale. At that moment, the evaluator only instructed the volunteer and clarified doubts when necessary without influencing her response.

The socio-demographic and general health data questionnaire was developed by the authors exclusively for this study. All responses regarding the health of the studied population were self-reported, and no specific exams or diagnostic reports were requested. The volunteers answered questions about their data (age, weight, height, marital status, course they are studying, time of relationship with their current partner); and personal health history (gynecological and obstetric history, physical activity, condom use, existing pathologies/general health, medication use and surgery).

The FSFI consists of 19 questions about women's sexual activity in the last four weeks. The participant should select, in each question, only one of the five or six alternatives that best describes her situation. The results of this instrument were analyzed by grouping the answers into six different domains: desire (questions 1 and 2); excitation (questions 3, 4, 5, and 6); lubrication (questions 7, 8, 9, and 10); orgasm (questions 11, 12 and 13); satisfaction (questions 14, 15 and 16) and pain (questions 17, 18 and 19).

For the domain scores, the individual score of each question is added and multiplied by the corresponding factor. The total score of the scale is the sum of the scores of each domain, and it is possible to find a variation between the minimum score of 2 - low sexual response - and the maximum score of 36 - good sexual response[18].

Self-esteem was assessed using the Rosenberg Self-Esteem Scale, considered a one-dimensional measure that presents ten statements related to a set of feelings of self-esteem and self-acceptance. It grades global self-esteem through six statements referring to a positive view of oneself and four referring to a self-deprecating vision. All of them are answered through a Likert scale: disagree; disagree; I agree, and I totally agree. The items have a score from 1 to 4, and in items 1, 2, 4, 6, and 7 the option "totally disagree" has a value of 1, the option "disagree" value of 2; "agree" has a value 3 and "totally agree", value 4. For items 3, 5, 8, 9, and 10, the scores are inverted: "Totally disagree" has a value of 4; "disagree", has a value of 3; "agree" has, a value of 2; and "totally agree" value 1. The scale values vary between 10 and 40, with 40 being the highest possible result for high self-esteem and 10 being the lowest possible result. García et al.[19], defined that a score equal to or above 30 is considered satisfactory.

During the pandemic period, between February and March 2021, virtually the same questionnaires were made available to the 90 university students participating in the previous face-to-face study: sociodemographic questionnaire, FSFI, and Rosenberg self-esteem scale. In addition, issues involving social isolation were included. The questions and possible answers involving this topic were: 1) Are you maintaining social isolation? (a) Yes, I go out only for essential activities; (b) No, I must go out daily to work; (c) No, I'm already leaving for leisure. The second question is 2) How many times a week do you leave the house? With the following possible answers: (a) Less than once; (b) Between once and twice; (c) Between three and four times; (d) Between five and six times (e) Daily.

Statistical analysis

To verify the hypothesis of a difference between the evaluations before and during the pandemic in the variables of the FSFI questionnaire and Rosenberg's self-esteem scale, the distribution of the data with the Kolmogorov-Smirnov test was first observed. For the variables in which Student's t-test assumptions for paired samples were not met, the Wilcoxon test was performed. The McNemar test was used in the analyses on changes in the FSFI and Rosenberg self-esteem scale classifications.

The differences between the moments before and during the pandemic were calculated in the body mass index (BMI) variables and the total score of the total FSFI and Rosenberg. The correlation of the variables Change BMI with Change FSFI score and Rosenberg score change was made with Spearman's correlation. The comparison with the social isolation variable was made by the Mann-Whitney test. The significance level of 0.05 was considered. The software used was the R Core Team 2020.

RESULTS

Of the 90 women included in this study, 67 answered all questionnaires sent virtually. They had a mean age of 22.9 (±2.99) years, and most of them were undergraduates in the health area (91%). The most frequent courses were physiotherapy or physical education (59.7%), and the less frequent courses were in the areas of human and exact education (9%). The mean age at first sexual intercourse was 17.51 (±1.95 years). Data is not shown in the table.

Table 1 shows general aspects related to the health issues of women participating in the study, such as medication use, obstetric and personal antecedents, physical activity practice, condom use, routine gynecological examinations, and BMI. Classification of the body mass index (BMI) was made as recommended by the World Health Organization[20]: BMI <18.5kg/m2 (low weight); BMI >18.5 to 24.9kg/m2 (eutrophy); BMI ≥25 to 29.9kg/m2 (overweight); and BMI >30.0kg/m2 (obesity).

Among the associated diseases, the most frequent were those related to the respiratory system (asthma and rhinitis), with a prevalence of 27.78%, followed by 22.22% of psychological disorders (depression and generalized anxiety), 16.67% of musculoskeletal

Table 1: General health aspects of volunteers.

	Frequency	Percentage	
Associated diseases			
No	49	73.1	
Yes	18	26.9	
Use of Contraceptives			
No	37	55.2	
Yes	30	44.8	
Use of Antidepressant			
No	61	91.0	
Yes	6	9.0	
Physical Activity Practice			
No	22	32.8	
Yes	45	67.2	
Pregnancy			
No	63	94	
Yes	4	6	
Use of condom			
No	16	23.9	
Yes	32	47.8	
Sometimes	19	28.3	
Routine gynecological examination			
No	7	10.4	
Yes	60	89.6	
	Before the Pandemic average (SD)	During the Pandemic average (SD)	P value
BMI (kg/m²)	23.02 (3.64)	23.83 (4.0)	<0.001

disorders (chondromalacia 11.11% of metabolic diseases (diabetes), 11.11% of diseases of the gastrointestinal tract (gastritis), 5.56% of balance disorders (labyrinthitis) and 5.55% of diseases in the reproductive system (endometriosis).

Table 2 shows marital and loving relationship status before and during the pandemic as well as respect for social isolation.

Women were rated according to the risk of sexual dysfunction (<26.55) and satisfactory or nonself-esteem (<30) by the score in the respective questionnaires. It was found that 23.9% of the women were classified as at risk of sexual dysfunction before the pandemic and 34.3% during the pandemic (p=0.19). Regarding unsatisfactory self-esteem, 46.3% were found before the pandemic, and 52.2% were found during the pandemic (p=0.47).

As shown in Table 3, although there was no significant difference in the total FSFI and Rosenberg Scale scores, there was a significant reduction in the FSFI arousal and sexual satisfaction domains.

The increase in BMI was not related to the change in the total FSFI score because, in Spearman's correlation test, a value equal to 0.11 was obtained with a p-value equal to 0.36. The same occurred with self-esteem, which was not affected by the increase in BMI during the pandemic, and in Spearman's correlation test, the rho value was equal to -0.09 with a p-value equal to 0.48. Data is not shown in the table.

As presented in Table 2, most women (58.2%) did not consider that they are respecting social isolation during the pandemic. When asked about how often they left home, the majority (34%) answered one to two times a week, followed by 22.4% three to four times, 19.4% five or six times, 19.4% daily, and only 4.5% said they did not leave the house.

The mean reduction in the final FSFI score during the pandemic was -2.32 (±8.68). However, the fact that they respected social distancing significantly reduced the FSFI score but did not change self-esteem, as shown in Table 4 and Figure 1.

DISCUSSION

The results of this study allow us to affirm that the COVID-19 pandemic did not significantly affect the sexual function and self-esteem of the group of young Brazilian undergraduate students. This is the first study to evaluate this theme in young women attending university to the best of our knowledge.

When comparing sexual function before and during the pandemic in the present study, maintenance was observed in the

Table 2: Distribution of the frequency of women about marital status and relationship with the partner before and during the pandemic, as well as respect for social isolation.

		Before pandemic N (%)	During pandemic N (%)
Status Marital	Married	3 (4.5)	6 (9.0)
	Single	64 (95.5)	61 (91.0)
Fixed sexual partner	Yes	48 (71.6)	46 (68.7)
	No	19 (28.4)	21 (31.3)
Social isolation	Yes	-	28 (41.8)
	No	-	39 (58.2)

Table 3: Descriptive measurements and comparison of FSFI questionnaire and Rosenberg Scale scores before and during the COVID-19 pandemic.

Evaluation		Before	During	p-value
Desire Domain†	Average	4.10	3.83	0.066
	SD	0.95	1.06	
	Minimum	1.80	1.20	
	Maximum	6.00	6.00	
Excitation Domain†	Average	4.93	4.47	0.010
	SD	0.97	1.51	
	Minimum	0.00	0.00	
	Maximum	6.00	6.00	
Lubrication Domain†	Average	5.17	4.85	0.301
	SD	0.99	1.65	
	Minimum	0.00	0.00	
	Maximum	6.00	6.00	
Orgasm Domain†	Average	4.42	4.17	0.498
	SD	1.54	1.82	
	Minimum	0.00	0.00	
	Maximum	6.00	6.00	
Satisfaction Domain†	Average	4.81	4.21	0.018
	SD	1.44	1.90	
	Minimum	0.00	0.00	
	Maximum	6.00	6.00	
Pain Domain†	Average	4.93	4.50	0.370
	SD	1.69	2.25	
	Minimum	0.00	0.00	
	Maximum	6.00	6.00	
Total FSFI score†	Average	28.35	26.03	0.071
	SD	5.47	8.32	
	Minimum	1.80	1.80	
	Maximum	34.90	35.10	
Rating Rosenberg Scale	Average	29.85	28.75	0.054
	SD	5.75	6.09	
	Minimum	16.00	13.00	
	Maximum	39.00	40.00	

Table 4: Descriptive measurements and comparisons of the variables Change FSFI score and Change Rosenberg score according to social distancing.

	Social isolation		
	No	Yes	p-value
Change FSFI			
Average	0.78	-6.62	0.003
SD	5.48	10.44	
Minimum	-9.50	-30.40	
Maximum	25.70	5.30	
Change Rosenberg			
Average	-1.23	-0.93	0.764
SD	4.30	5.08	
Minimum	-10.00	-13.00	
Maximum	10.00	8.00	

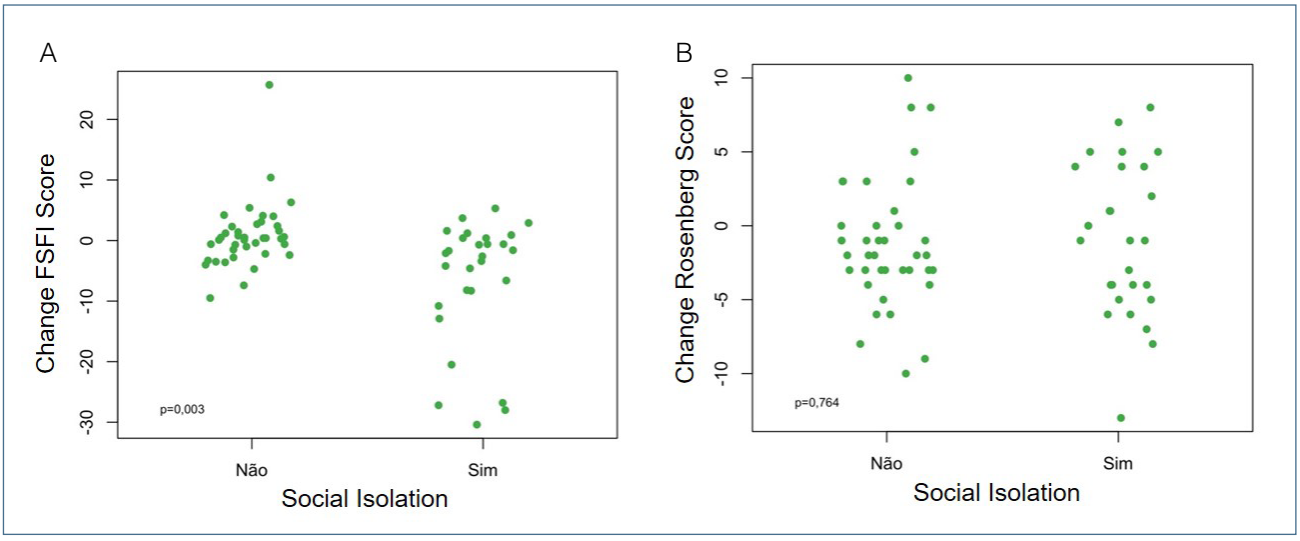

Figure 1: Distribution of variables. (A) Change in FSFI score and social isolation (B) Change in Rosenberg score and social isolation.

total FSFI score (p=0.07). In three studies that verified the sexual function of women during the COVID-19 pandemic, there was a significant reduction in the final FSFI score[11,13,21]. In the present study, on average, there was a reduction of -2.32, a value much lower than that found by Schiavi et al.[21] and Fuchs et al.[11] who observed indexes of -9.7 and -4.3, respectively, and slightly lower than that found by Yuksel & Ozgor[13], which was -2.96. In these three studies, the women involved were slightly older than the participants in this study, and most of them lived with their partners and were married. From our results, we can infer that living in different households can maintain the sexual satisfaction of the couple, perhaps by minimizing the damage to everyday life in the relationship.

It is interesting to note that a minority of women had a risk of sexual dysfunction before (23.9%) or during (34.3%) the pandemic. Satake et al.[22], evaluated 149 young university students with a mean age of 21 (±1.68) years and found that 28.8% of women had sexual dysfunction, a result higher than that found in the present study before the pandemic. These data are intriguing since the population evaluated in both studies was homogeneous in age and area of undergraduate courses. Perhaps the justification for this fact is due to the difference in generation between these studies, considering that over the years, there is a greater tendency for women to seek sexual pleasure, mainly due to cultural changes that stimulate this right.

When separately analyzing the impact of the pandemic in each FSFI domain, a significant reduction was observed only in the excitation (p=0.01) and satisfaction (p=0.01) domains. Fuchs et al.[11], found a significant reduction in all domains, while Schiavi et al.[21], and Yuksel & Ozgor[13] found a reduction in the desire, arousal, orgasm, and satisfaction domains. It is noteworthy, then, that the significant reduction found in the arousal and satisfaction domains of the present study is in agreement with the mentioned studies. It can be assumed that the level of stress caused by the pandemic has a greater influence on these domains. It would be interesting for further studies to be conducted to analyze the factors that could influence each of the domains separately.

Additionally, about the FSFI, women who were isolated compared with those who did not, presented a significant reduction (p=0.003) in the mean total score (-6.62). This result allows us to point out that the impact of the pandemic on the life of the population may be related to the level of social restriction that each government institute imposes.

Social isolation was not investigated in other studies on sexuality, although some authors found that women with work outside the home showed a higher reduction in FSFI than those with activity at home[11,21]. These results are in disagreement with the present study and may be justified by the fact that the women who worked outside were in the group that did not respect social isolation and those without prejudice to sexual function. Perhaps the cultural differences between the countries of the studies mentioned and the feeling of fear may have influenced this disagreement. In Europe, where the studies by Fuchs et al.[11], Schiavi et al.[21] and Yuksel & Ozgor[13] were conducted, the population seems to have better respected the recommendations of social isolation than in Brazil.

The strategy adopted in the state of São Paulo to reduce the spread of the virus was to implement social distancing, with closure or restriction of the operation of schools, universities, restaurants, and public leisure places. However, it was found that the majority (58.2%) of the young university students who did not respect social isolation used different justifications: the need to work or make weekly domestic purchases or maintain their social meetings.

Although it is known that financial issues affect most of the population during the pandemic, unfortunately, people with lower incomes have much less opportunity to stay at home than those with high incomes[23]. However, these data were not verified in the population studied. Another reason that may have influenced the behavior found in the present study was the fact that some Brazilian authorities and politicians were skeptical about the effectiveness of social distancing to contain the pandemic[24].

The total Rosenberg scale score showed that the women evaluated in the present study had slightly lower self-esteem than those considered healthy, according to García et al.[19]. Nevertheless, this result was higher before and during the pandemic (29.85 and 28.75, respectively) when compared to the self-esteem of university students from Pakistan (17.89) in a 2016 study[25]. Self-esteem is directly impacted by high levels of stress, and this condition occurs in the lives of university students due to factors such as the transition phase to adulthood[26]. It is vital to highlight the important difference between the number of women involved in the present study (n=67) and the 175 women involved in the study Haq[25], a fact that may justify the discrepancy between the results. There may also be differences between pedagogical issues related to teaching and evaluations among universities, which could influence the stress experienced by university students, with greater or lesser impairment of self-esteem.

Our findings indicated a significant increase in body weight, a result that agrees with other authors[27]. An important Brazilian study involving 45,161 individuals found an increase in the intake of unhealthy foods and a decrease in physical activity during the pandemic[27]. Although the information on diet and physical activity practice was not verified during the pandemic, in our population studied, these factors may justify the significant increase in BMI found.

This study is the first to investigate the self-esteem of young university women during a health and humanitarian crisis, and it can be affirmed that the COVID-19 pandemic did not affect it. Although an increase in BMI can hurt women's self-esteem[28], this fact was not observed in the present study. This result can be justified because most of the women included did not respect the recommendation of isolation, maintaining social interaction with consequent reduction of concerns with body aesthetics.

Other factors may be related to the non-alteration of sexual function and self-esteem, such as the late moment of application of the questionnaire (February and March 2021), considering the restrictions and worsening of the pandemic in Brazil. Social isolation was much higher at the beginning of the pandemic but significantly reduced over time[29]. In addition, it can be hypothesized that women with greater motivation to answer the questionnaires during the pandemic were those with the lowest impairment in questions related to sexual function and self-esteem.

The limitation of the study is the non-inclusion of questions about mental health, stress level, and continuity of physical activity during the pandemic. We know that before the pandemic, 22.2% of young women reported some mild psychological disorder because only 9% of them were medicated. However, because this is an extremely vulnerable population, it would be important to investigate whether this situation was altered during the pandemic. Brazilian studies have shown that the damage to mental health caused by a pandemic was directly related to the female gender, younger adults, and the duration of social isolation[30]. Thus, we suggest that other studies be conducted to verify the association of mental health, stress levels and physical activity, sexual function, and self-esteem during the pandemic.

Based on this presented study, we conclude that the behavior of social isolation, rather than just the COVID-19 pandemic, impaired the sexual function but not the self-esteem of Brazilian undergraduate students. This fact is interesting since low self-esteem is usually associated with increased body weight. We recommend further studies on sexual function and self-esteem specifically aimed at young university women, to define which aspects, among the physical, relational, health, or even environmental ones can most influence these questions.

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