

Attachment and Sexuality: Impact of Confinement by COVID-19

Dagmarie Torres-Cruz¹ · Berta Aznar-Martínez¹ · Carles Pérez-Testor¹

Abstract

This study examined attachment style and its relationship with sexual self-esteem during COVID-19 confinement. COVID-19 has caused changes in the way couples interact intimately and sexually around the world; some have found improvements and others an increase in difficulties. This article uses a retrospective pre post approach to evaluate 120 men and 89 women who were part of a couple at the time of confinement in Spain and completed an online survey. The sample was obtained during the de-escalation months, from May 9th until July 1st, 2020. Through an online survey we collected the data using the Spanish version of the Experiences in Close Relationships (ECR-S) to measure attachment and the Brief Sexuality Scale (SS) to measure aspects related to the participants sexuality (sexual self-esteem, sexual depression, and sexual preoccupation), as well as a scale designed post hoc on other aspects related to sexuality. Overall, the t-test results suggest that confinement had a negative effect on sexuality because sexual depression (SD) had a small increased in our sample. Multiple regression analysis showed that FSI, and ANXS attachment style were able to predict sexual depression during confinement. The results also showed a decrease in the strength of the relationship between sexual self-esteem (SSE) and attachment styles during confinement. However, sexual preoccupation (SP) and sexual self-esteem (SSE) remained relatively stable. Based on the results obtained, we conclude that there is an association between an increase in participants' sexual depression and being confined due to COVID-19.

Keywords Attachment · Sexual self-esteem · COVID-19 · Sexuality · Intimacy

Dagmarie Torres-Cruz dagmarietc@blanquerna.url.edu

¹ Facultat de Psicologia, Ciències de l'educació i de l'Esport Blanquerna, Universitat Ramon Llull, C/Císter 34, 08022 Barcelona, Spain

Introduction

COVID-19 resulted in global social isolation (Banerjee & Sathyanarayana, 2020), and created the need for confinement in many countries, including in Spain. This new status quo changed family dynamics both individually and collectively. An important aspect that may be affected by the COVID-19 confinement is sexuality (Karagöz et al., 2020). Sexuality is “a central aspect of being human throughout life and is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviors, practices, roles and relationships” and encompasses different components (Macleod & McCabe, 2019, p. 6). Sexual self-esteem is an important aspect of our sexuality (Rodríguez-Domínguez et al., 2021). For example, it has been found that sexual self-esteem can predict satisfying sexual behaviors which translates to sexual satisfaction (Zarbakhsh et al., 2013). Even more, researches have stated that marital life could lack real meaning without positive sexual self-esteem (Tavakolizadehj & Rastgoo Nejad, 2016). Therefore, it is important to study this construct in different environments and situations.

Various studies have found an association between being confined due to COVID-19 and a deterioration in people's sexuality (Jacob et al., 2020) and their sexual self-esteem (Rodríguez-Domínguez et al., 2021). However, other studies have found an increase in sexuality during the pandemic (Luetke et al., 2020) and suggest that certain individual strengths, for example, attachment styles, might have served as a protective factor against this deterioration in sexuality (Pietromonaco & Overall, 2020). Besides attachment styles, there are mediating variables that are convenient to analyze when talking about sexuality and sexual self-esteem. One of those variables is gender. In general, studies have shown that there is a difference between men and women when talking about sexual self-esteem (Peixoto et al., 2018). For example, Rodríguez-Domínguez et al., (2021) reported that gender, specifically being male, could serve as a mediating variable in the relationship between gender and having higher sexual self-esteem during the lockdown.

In sum, the present study aims to keep investigating the influence of COVID-19 on sexuality with a focus in sexual self-esteem, sexual depression, and sexual preoccupation. We aim to explore the relationship these variables have with attachment styles. A worldwide lockdown, like the one that happened due to COVID-19, had not happened before, so we lack studies regarding the effects that confinement and isolation can have on sexuality in a Spanish population. Furthermore, because little research has addressed the sexual self-esteem, sexual depression, and sexual preoccupation concepts in Spain during COVID-19, our goal is to contribute to the study of these concepts rather than study intimate and sexual behaviors and experiences (Luetke et al., 2020), or sexuality in general (Panzeri et al., 2020).

Attachment and Confinement

Attachment theory was initially developed to better understand the emotional bonds between children and their primary caregivers (Bowlby, 1988). If the infant feels safe, it can develop secure attachment, but if it feels threatened or in trouble, and the primary caregiver rejected them or failed to provide safety, it can develop insecure attachment (Bowlby, 1988). This is also true in adult relationships. Bonds are formed based on whether we feel we can rely on another person, or not. Brennan et al., (1998) conceptualize attachment as regions in a continuous two-dimensional space. The first dimension, anxiety, is concerned with fear of rejection and abandonment by romantic partners; the second dimension, avoidance is concerned with the degree to which a person feels uncomfortable depending on and being close (e.g.,

psychologically intimate with others) (Brennan et al., 1998). If a person has high anxiety and/ or high avoidance, they are experiencing insecure attachment; therefore, when anxiety and avoidance are low, there can be secure attachment. People with lower levels of anxiety and avoidance (characteristics of secure attachment) usually report better sexual self-esteem and sexuality since they feel more comfortable expressing affection and exploring sexuality freely (Mikulincer & Goodman, 2006). The study of adult attachment has evolved and led to many insights concerning adult romantic and sexual relationships and has contributed understanding of the underlying emotional processes of sexuality in different contexts (Alonso-Arbiol et al., 2007).

Confinement due to COVID-19 is a unique context. Some studies reported that

it had a negative impact on psychological well-being (Pietromonaco & Overall, 2020) and increased anxiety, depression, and stress in their sample (Rodríguez- Rey et al., 2020). Unfortunately, as we mentioned previously, these specific mood states can have a negative impact on sexuality, and more specifically, on sexual self-esteem (Potki et al., 2017). It has been found that confinement can affect intimacy and sexuality (Banerjee & Sathyanarayana, 2020), but this will depend on the attachment style (Moccia et al., 2020) and support provided by each member of the couple (Vowels & Carnelley, 2021).

In general, people with lower levels of insecure attachment have reported having protective effects in stressful situations (Islam et al., 2020) and even during the COVID-19 pandemic (Pietromonaco & Overall, 2020) therefore, this could help couples' sexuality and sexual self-esteem. An investigation carried out in Italy during confinement by COVID-19 suggests that lower levels of insecure attachment could have a protective effect against the risk of a more significant psychological burden (Moccia et al., 2020). Even more, anxiously attached people seek more physical and emotional closeness, and these are factors that some studies have found have been affected by COVID-19 confinement since people were encouraged to avoid kissing, hugging and being physically close to other people during the pandemic (Karagöz et al., 2020). This could cause a deterioration in sexuality and couples' relationship (Luetke et al., 2020). Therefore, COVID-19 may affect the way people behave sexually. Unfortunately, since studies on the topic are very scarce, it is indispensable for

the scientific community to understand the link between attachment styles and sexuality in the context of COVID-19 confinement in order to develop relevant and accurate intervention models.

Sexuality, Attachment, and Confinement

Sexuality is essential in the development and maintenance of the couple relationship (Bilal & Rasool, 2020) and it is influenced by different factors, such as attachment styles (Busby et al., 2020), among others. In this study, we focused on sexual self-esteem since it is a key aspect of sexuality and can be defined as what a person thinks and feels regarding their sexuality (Soler et al., 2016). Sexual self-esteem contributes to the development of a healthy sexual life in a couple relationship (Brassard et al., 2013) since it affects how a person relates to their partner, intimately and sexually (Antičević et al., 2018; Bogaert & Sadava, 2002).

Studies have found that people with insecure attachment styles, either anxious/ avoidant, report less sexual self-esteem (Brassard et al., 2013). This may be because the internal working models associated

with the development of attachment are transferred to romantic relationships (Pietromonaco & Barrett, 2000). Anxiously attached people fear that their partner will be inaccessible to support them when they need it, which causes high levels of stress, and deterioration in the couples' intimacy (Fuenfhausen & Cashwell, 2013) sexuality and sexual self-esteem (Antičević et al., 2018). And avoidantly attached people have a positive perception of self but a negative perception of others (Fuenfhausen & Cashwell, 2013), which also has an impact in their sexuality and sexual self-esteem (Shaver & Mikulincer, 2006).

Avoidantly attached people distrust partners' support and love and adopt deactivating strategies, while anxiously attached people adopt hyperactivating strategies, and compulsively seek proximity (Siegel et al., 2019). This can affect couple relationship, and therefore also affect a couple sexuality. For example, anxiously attached people use sexual intercourse to gain a partner's love and prevent abandonment which often result in low sexual self-esteem and less sexual satisfaction (Antičević et al., 2018). Avoidantly attached people often use masturbation, and casual sexual activities with strangers to maintain an emotional distance and control the intimacy in relationships (Schachner & Shaver, 2004). This contributes to low sexual self-esteem, reduced sexual desire, and less sexual satisfaction in couple relationships (Cassioli et al., 2020).

In contrast, people with lower levels of insecure attachment have better communication, higher levels of trust with their partners, and feel comfortable seeking emotional closeness which helps to develop a better sexual self-esteem and higher sexual satisfaction in long-term relationships (Hoseinabad et al., 2018). The scientific study of attachment styles has demonstrated that people with lower levels of insecure attachment (characteristic of secure attachment) have higher and better sexual self-esteem (Mikulincer & Goodman, 2006). Sexuality is influenced by internal and external factors (Bilal & Rasool, 2020), and the same is true for sexual self-esteem (Hepper et al., 2006). According to Meston et al. (2006), sexual self-esteem is negatively affected by daily life stressors; some examples may be childcare or financial problems, factors that have been affected by COVID-19 (Döring, 2020).

On the contrary, it has been found that feeling valued and loved helps to increase couples' attachment, their sexual self-esteem (Heinrichs, 2007), and their sexuality, therefore, it could serve as protective factors against the pandemic (Banerjee & Sathyanarayana, 2020). Another factor that influences sexual self-esteem and attachment is the frequency of sexual intercourse (Hepper et al., 2006). We will explore its relationship with sexual self-esteem during confinement in this study because studies have reported that the frequency of sexual intercourse could decrease due to COVID-19 confinement (Karagöz et al., 2020). Unfortunately, even though these results have been established in various investigations before the COVID pandemic, to our knowledge, little research has addressed the effect COVID-19 had on sexual self-esteem and the role attachment styles play during confinement in Spain.

Spain was one of the most affected countries in the world when COVID-19 started in terms of the absolute number of diagnosed cases (Domínguez-Gil et al., 2020), and it had the world's second-highest number of deaths in relation to the number of inhabitants, with 544 deaths per million inhabitants (Orgilés et al., 2020). On top of that, previous studies have shown that the pandemic in Spain increased anxiety, depression, and stress in the general population which, as previously stated, affect sexuality and sexual self-esteem (Rodríguez-Domínguez et al., 2021).

Even though we don't have knowledge of any study made exclusively in Spain about COVID-19 confinement and attachment styles, some studies have considered Spain and other populations and found that secure attachment style could serve as a protective factor against the confinement by COVID-19. A study carried out in Austria (n = 104), Poland (n = 87), Spain 134 (n = 65), Czech Republic (n = 33), and four

additional regions (Germany, Netherlands, Italy, 135 Pakistan; n = 24) stated that attachment security predicts relationship quality during COVID-19 lockdown restrictions (Eder et al., 2021) which is important when it comes to couples' sexuality. Another study with a sample from the United Kingdom 59.5%, USA 8.5%, Portugal 6.5%, Poland 4.6%, other 20.9% found that avoidant attachment was associated with less support, whereas attachment anxiety moderated the relationship between goal conflict and support (Vowels & Carnelley, 2021). Therefore, Eder et al., (2021) talk about the protective effect of secure attachment and Vowels and Carnelley (2021) stated that individuals scoring high in attachment anxiety actually perceived their partners as more supportive compared to more secure individuals when goal conflict was high. Because of this divergent result on the effects of confinement on sexuality and intimacy we think it is beneficial to develop more knowledge and evidence to the scientific community regarding the attachment styles and the link they have on sexuality during COVID-19 confinement.

In this study, we aimed to explore whether there are differences between our sample's sexuality, more specifically, our sample's sexual self-esteem, sexual depression, and sexual preoccupation, using a retrospective pre post approach. Trauma negatively correlates with sexual self-esteem (Habib, 2020), and an investigation carried out during COVID-19, which has been considered a traumatic event (Kira et al., 2020), showed a reduction of sexual self-esteem and a decrease in the number of interpersonal sexual relations (Rodríguez-Domínguez et al., 2021). Based on this literature, we hypothesize that sexual self-esteem will decrease during COVID-19 confinement, and sexual depression, and sexual preoccupation will increase during isolation.

We also aim to assess the link between sexual self-esteem, sexual depression and sexual preoccupation, and the different attachment styles (anxious and avoidant attachment styles). Brassard et al., (2013) stated that anxiously attached people reported lower sexual function and satisfaction and that this is fully explained by lower sexual self-esteem and higher sexual anxiety. With regard to avoidant attachment, higher sexual anxiety and lower sexual self-esteem partially mediated the associations between avoidance and sexual satisfaction (Brassard et al., 2013). Another study found that both anxious attachment and avoidant attachment had a negative relationship with sexual self-esteem (Hepper et al., 2006). Therefore, we hypothesize that low levels of insecure attachment (characteristic of secure attachment), will have a positive relationship with the participant's sexual esteem during confinement, and negative relationship with the participant's sexual depression, and sexual preoccupation during confinement.

The current study expects to find gender differences in the attachment variable, as most studies report that women tend to have anxious attachment and men report having avoidant attachment (Antičević et al., 2018). For this reason, we will investigate whether there are gender differences in the SS since gender is important with regard to sexuality and sexual self-esteem (Rodríguez- Domínguez et al., 2021). We hypothesize that women will have lower sexual self-esteem than men, as studies have reported that sexual self-esteem is lower in women than in men (Potki et al., 2017). Finally, we will explore the relationship between frequency of sexual intercourse and the SS subscales since the frequency of sexual intercourse is key when it comes to sexual satisfaction (Jacob et al., 2020; Karagöz et al., 2020), and sexual self-esteem (Hensel et al., 2011). We hypothesize that sexual self-esteem will have a positive correlation with frequency of sexual intercourse. In addition, we will investigate the link between frequency of sexual intercourse and attachment styles (avoidant and anxious). We hypothesize that both attachment styles will have a negative correlation with frequency of sexual intercourse since studies have stated that people with insecure attachment styles usually report having less sexual intercourse (Attaky et al., 2020).

Method

Sample

The study sample was composed of 209 subjects. Men composed most of the sample, 57.4%. Almost three-quarters of the sample (70.8%) had a high education. 92.3% were confined in the same house with their partner, 60.8% lived with children during confinement, and only 20.1% of the sample reported that a loved one had become ill. We obtained the sample between May 9th and July 1st, 2020, through the implementation of online questionnaires. The study's inclusion criteria are being over 18 years of age, residing in Spain, and currently having a partner. Therefore, our exclusion criteria were being single, younger than 18 years old and/or not living in Spain.

Study Measures

The Adult Attachment Questionnaire (ECR-S) (Alonso-Arbiol et al., 2007) was used to assess the adult attachment style since it has a discriminatory capacity between romantic attachment styles (avoidant and anxious). We divided both subscales based on the mean with a higher score which indicates greater feelings of comfort with closeness and intimacy while a lower score indicates lower feelings of comfort with closeness and intimacy. The scale obtained an alpha coefficient of 0.87 for the avoidance scale and 0.85 for the anxiety scale. In addition, the scale proved to have adequate test–retest reliability over six weeks and good construct validity. The scale is composed of 32-item, with 17 avoidance items and 15 anxiety items. Items in these subscales were rated on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

The sexual self-esteem was assessed through The Sexuality Scale (SS) (Soler et al., 2016) originally developed by Snell and Papini (1989). This scale is composed of 3 components: sexual self-esteem (SSE), sexual depression (SD), and sexual preoccupation (SP), all 3 with 5 items each. All subscales have a Cronbach α above 0.85 which indicates high levels of reliability and with no item correlation below 0.30. The SS assesses how people feel and think about their sexuality. Items in these subscales were rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

We also designed an ad hoc questionnaire on other aspects related to sexuality in the couple. It has 4 items in nominal scale such as “Are you satisfied with the amount of sexual intercourse you have had during confinement?” “Approximately how often have you had sex during confinement?”. Participants provided information on their background. All respondents indicated their sex, age, educational level, length of marriage, among others.

Procedure

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the ethics committee. Based on this, online questionnaires were created. A disclosure was fixed on the first sheet of the online survey, in which subjects were required to check a box to indicate consent before accessing the survey. Prospective participants were directed to an online study which contained a description of the study, an informed consent form, and a link to an anonymous online questionnaire. Furthermore, prior to completing any study measures subjects were informed about the inclusion criteria. Criteria for inclusion were male and female older than 18 years old, live in Spain during confinement, and have a partner. Therefore, our exclusion criteria were being single, younger than 18 years old and/or not living in Spain.

Data collection period was between May 9th and July 1st, 2020, which were the de-escalation months. Given the restrictions imposed, data were collected online, by an external company through a Google Forms questionnaire. This company carried out data collection, review, programming, implementation, and uploading of the questionnaire to the online survey platform. We used a retrospective pre post approach. The participants were asked to answer The Sexuality Scale (SS) thinking about their sexuality before the confinement began, and right after they completed it, they were asked to respond the scale again but this time thinking about how they were feeling during the confinement. Before performing the statistical analysis, data quality control was performed. Then, we analyzed whether the data were normally distributed in the sample for all variables studied. No participants were compensated for their participation.

Statistical Analysis

Software SPSS (version 26) was used. The statistical analyzes are descriptive and inferential. We presented the proportions (%) of the sociodemographic data. In addition, correlation coefficients between The Adult Attachment Questionnaire (ECR-S) and Sexuality Scale (SS) were computed using Pearson's correlation coefficients. We also analyzed the correlation coefficients between (SS) subscales, sexual self-esteem, sexual depression, and sexual preoccupation and the (ECR- S) subscales avoidant and anxious attachment. For controlling the possible confounding effects of the socio-demographic variables of type of relationship, whether the person was confined with their partner or not, and was living with children during confinement, partial correlations by gender were calculated between each of the SS subscales and Frequency of Sexual Intercourse. We performed paired T-test by gender to compare difference between means of the SS before and during confinement, as well as all SS subscales. A Chi-squared was conducted to assess whether there are statistically significant differences by gender regarding the attachment variable. Lastly, to assess the influence of anxious attachment, and the influence of FSI on sexual depression (SD), we calculated a linear regression model.

Table 1 Gender differences and scores in the ECR-S subscales

	Gender	N	M	SD
AA	Male	120	48.1417	15.08759
	Female	89	41.3708	12.12940
ANXS	Male	120	52.3000	14.80154
	Female	89	46.5506	12.62304

AA Avoidance Attachment, ANXS Anxious attachment, N Number of participants, M Mean, SD Standard deviation

Results

Gender differences in the ECR-S subscales are shown in Table 1. When evaluating the ECR-S subscales, we found that men scored higher on both insecure attachment subscales, Avoidant and Anxious. On applying paired sample t-test to evaluate the difference between SS before and during confinement split by gender, results revealed that there were statistically significant differences for men, between before (M = 41.33, SD = 6.94) and during (M = 42.10, SD = 6.20) confinement ($t(208) = -2.844$, $p < 0.01$, 95% CI [-1.300, -0.232]) and for women between before (M = 39.95, SD = 7.12) and during (M = 40.97, SD = 6.59) confinement ($t(208) = -3.352$, $p < 0.01$, 95% CI [-1.610, -0.4116]) suggesting a statistically significant increase in SS. It is important to note that even though these associations were significant, the effect size is small for both gender (M/0.259 and F/0.355). Since this statistically significant difference was found in the scale, we evaluated the subscales separately and split by gender. Table 2 illustrates the detailed information obtained by performing a paired samples t-test to assess the differences between before and during confinement regarding the scores of the SS subscales.

Pearson Product Moment correlation analysis were applied to explore the relationship between the SS and ECR-S subscales. The relationship between SSE and avoidant attachment was negative, moderately low, and statistically significant but the strength of the relationship between the variables increased during confinement. The relationship between SD and SP subscales with the avoidant attachment subscale, decreases during confinement. Findings concerning the relationship between the anxious attachment subscale with SSE subscale, showed a negative relationship before and during confinement. On the other hand, the relationship between SP and SD subscales with anxious attachment was positive in

Table 2 Comparison of SS subscales, Before and During confinement by gender

	Gender	Mean	Std. deviation	Mean comparison	Sig. (2-tailed)	Effect Size Cohen's D
Pair 1						
Sexuality Scale	Female	-1.011	2.846	-3.351	0.001	-0.355
Before-during	Male	-0.766	2.952	-2.844	0.005	-0.259
Pair 2						
Sexual self esteem	Female	0.146	2.753	0.500	0.618	
Before-during	Male	-0.016	2.053	-0.088	0.929	
Pair 3						
Sexual depression	Female	-1.011	3.174	-3.004	0.003	-0.318
Before-during	Male	-0.641	2.252	-3.121	0.002	-0.284
Pair 4						
Sexual preoccupation	Female	-0.146	1.715	-0.803	0.424	
Before-during	Male	-0.108	1.633	-0.726	0.469	

SS Sexuality Scale

Table 3 Correlation between analyzed variables and 95 % confidence intervals

Variable	1	2	3	4	5	6	7	8
	95% CI AA	95% CI ANXS						
1. AA	-							
2. ANXS	0.989** (0.985;0.992)	-						
3. SSE_B	-0.360* (-0.498;-0.242)	-0.368** (-0.477;-0.261)	-					
4. SSE_D	-0.436* (-0.558;-0.319)	-0.426** (-0.531;-0.308)	0.824**	-				
5. SD_B	0.902** (0.393;0.997)	0.482** (0.370;0.590)	-0.678**	-0.631**	-			
6. SD_D	0.460** (0.368;0.578)	0.450** (0.342;0.558)	-0.574**	-0.740**	0.829**	-		
7. SP_B	0.158* (0.023;0.287)	0.151* (0.015;0.281)	0.045	-0.074	0.262**	0.232**	-	
8. SP_D	0.141* (0.005;0.271)	0.141* (0.006;0.272)	0.019	-0.023	0.254**	0.185	0.943**	-

Patterns of correlation between the variable analyzed (* $p < 0.05$, ** $p < 0.01$).

CI Confidence Interval, ANXS Anxious Attachment, AA Avoidance Attachment, SD_B Sexual Depression before, SD_D Sexual Depression during, SP_B Sexual Preoccupation before, SP_D Sexual Preoccupation during, SSE_B Sexual Self-esteem before, SSE_D Sexual Self-esteem during

both cases, but the strength of the relationship decreased. The results of the Pearson correlation are presented with corresponding 95% confidence intervals (CI) at both times, before and during confinement (Table 3).

Results of the relationship between AA, ANXS and the FSI for men ($r = -0.062/r = -0.052$, $p = 0.095$) and women ($r = -0.098/r = -0.076$, $p = 0.095$), indicated that there is no statistically significant relationship. We found a statistically significant relationship between FSI and SD just for women and a statistically significant relationship between FSI, SSE and SD for men. In our sample this suggests that FSI does not have a relationship with women SSE. To explore the relationship between type of relationship, whether the person was confined with their partner or not, was living with children during confinement, and FSI, partial correlation coefficients were computed by gender. Results are displayed in Table 4.

Additionally, differences between gender and insecure attachment styles were examined using Chi-square analysis. The analysis showed that there was significant association between gender and avoidant $\chi^2(1) = 0.87.047$, $p = 0.008$ and gender and anxious attachment subscale $\chi^2(1) = 0.83.035$, $p = 0.011$. Finally, a linear regression was performed to analyze the main effects of the ANXS attachment subscale and the FSI on the SD. In order to use the FSI variable, we transformed it into dummy variables, and we used the z-scored for the ANXS variable (Table 5). The analysis was statistically significant ($F(1095.005$,

Table 4 Frequency of Sexual Intercourse and the subscales of the SS split by Gender

Control variables	Variables	Male (n=120)				Female (n=89)			
		1	2	3	4	1	2	3	4
None	1. FSI	-				-			
	2. SSE	0.317**	-			0.0121	-		
	3. SD	-0.226*	-0.794**	-		-0.253*	-0.634**	-	
	4. SP	-0.042	-0.090	0.246*	-	-0.076	0.088	0.079	-
Confined together or not	1.FSI	-				-			
	2. SSE	0.327**	-			0.122	-		
	3. SD	-0.244*	-0.795**	-		-0.246*	-0.636**	-	
	4. SP	-0.031	-0.092	0.253*	-	-0.056	0.090	0.064	-
Living with children	1. FSI	-				-			
	2. SSE	0.333**	-			0.150	-		
	3. SD	-0.231*	-0.775**	-		-0.284*	-0.619**	-	
	4. SP	-0.041	-0.070	0.253*	-	-0.078	0.093	0.078	-
Type of relationship	1. FSI	-				-			
	2.SSE	0.316**	-			0.123	-		
	3. SD	-0.224*	-0.789**	-		-0.251*	-0.637**	-	
	4. SP	-0.043	-0.095	0.256*	-	-0.069	0.084	0.069	-

* $p < 0.05$; ** $p < 0.01$. SSE Sexual Self-Esteem, SP Sexual Preoccupation, SD Sexual Depression, FSI Frequency of Sexual Intercourse

Table 5 Summary analysis of the multiple regression analysis of the predictors and criterion

Model	Independent variables	B	SE	β	t	p value
1	(Constant)	-0.125	1.307		-0.096	0.924
	Everyday	3.207	1.302	0.189	2.463	0.015**
	4-6 per week	3.272	1.067	0.277	3.067	0.002**
	2-3 per week	3.118	0.984	0.316	3.169	0.002**
	Once per week	2.990	1.048	0.228	2.471	0.014**
	Every two weeks	1.736	1.259	0.108	1.379	0.169
	Once per month	1.766	1.394	0.095	1.267	0.207
	ANXS	0.145	0.020	0.453	7.375	0.001**

Dependent Variable: Sexual Depression, *FSI* Frequency of Sexual Intercourse, *ANXS* Anxious Attachment, *SE* Standard Error, ** $p < .001$; * $p < .05$

Table 6 Gender difference regarding sexual experiences

Variables	Gender		%	Total
	M	F		
Comparison of sexual intercourse before and during confinement	<i>f</i>	<i>f</i>		
Didn't have any	8	13	10	21
Had more	38	26	30.6	64
Had less	24	15	18.7	39
Same as before	50	35	40.7	85
Satisfaction with sexual intercourse				
Yes	95	62	75.1	157
No	25	27	24.9	52
Frequency of sexual intercourse				
Everyday	6	10	7.7	16
4-6 per week	25	12	17.7	37
2-3 per week	39	23	29.7	62
One per week	19	22	19.6	41
Every two weeks	9	9	8.6	18
Once per month	10	3	6.2	13
None	12	10	10.5	22

f frequency, *M* male, *F* female

3155.235) = 9.965, $p < 0.01$, $R^2 = 0.258$). Taken together, these two variables explained approximately 25.8% of the variability in the SD sub-scale during confinement. Table 6 present gender difference regarding sexual experiences.

Discussion

The present study aimed to investigate the link between attachment styles and sexuality while being confined by COVID-19. The results indicate that avoidant attachment and anxious attachment had a higher association with sexual self-esteem during confinement and sexual depression and sexual preoccupation had a lower relationship during confinement than before. Based on the above, our results suggest that people with lower levels of insecure attachment would be associated with higher levels of sexual self-esteem, and anxious and avoidant attachment styles are associated with higher levels of depression and sexual preoccupation (Antičević et al., 2018). These results could be based on those reported by Moccia et al. (2020), who reported on the possible protective effect of secure attachment during the COVID-19 pandemic, as well as that reported by Pietromonaco and Overall (2020) when they pointed out the possible protective effect of secure attachment in situations of great stress.

Furthermore, we found that, during confinement, there was a small increase in sexual depression in our sample. These findings are consistent with previous reports on the negative effect of COVID-19 on sexuality (Döring, 2020), and not only on sexuality, since studies have suggested that COVID-19 has also caused an increase in stress and psychological depression (Rodríguez-Rey et al., 2020), which are factors that harm sexuality and sexual self-esteem (Offman & Matheson, 2004).

We found two factors that are accounted for the increase in sexual depression during confinement. One is the anxious attachment which explained 20.8% of the total variance in sexual depression and the other one is the frequency of sexual intercourse which we found that this accounted for approximately 5.7% of the total variance in sexual depression. The increase on sexual depression could be the reason why 18.7% of the sample reported having had less sexual intercourse, 10% reported not having sexual intercourse during quarantine and 24.9% of the participants reported not be satisfied with the amount of sexual intercourse.

In general, there has been found a negative relationship between decrease in the amount and frequency of sexual intercourse and sexual satisfaction (Karagöz et al., 2020) and sexual self-esteem (Hepper et al., 2006). Also, studies have shown that this decrease in sexual intercourse can cause deterioration in sexuality during confinement by COVID-19 (Panzeri et al., 2020). For example, a study conducted in the United Kingdom reported that 60% of its sample had had a decrease in sexual intercourse (Jacob et al., 2020) and another study conducted in China found a decrease of 37% (Li et al., 2020a, 2020b).

The importance of attachment styles when it comes to the number of sexual relations (Bogaert & Sadava, 2002), sexual self-esteem (Gentzler & Kerns, 2004), and sexuality has been confirmed in numerous studies (Busby et al., 2020). Furthermore, studies have found that sexual self-esteem explains how people relate sexually depending on their attachment style (Brassard et al., 2013). This is so because sexual intercourse in the relationship tends to increase intimacy (Antičević et al., 2018) which has been confirmed to correlate positively with secure and anxious attachment and negatively with avoidant attachment (Fuenfhausen & Cashwell, 2013). In our sample, none of the attachment subscales had a statistically significant relationship concerning the frequency of sexual intercourse during confinement, but we found a positive association between the sexual self-esteem subscale and the frequency of sexual intercourse and negative regarding sexual depression. Therefore, in our sample, the higher the sexual depression, the lower the frequency of sexual relations, and the higher the sexual self-esteem, the higher the frequency of sexual relations reported by the participants.

In addition, research suggests that women and men differ in attachment style. Some report that women tend to have anxious attachment and men avoidant attachment (Antičević et al., 2018). Our hypothesis

about the gender differences between insecure attachment styles is partially supported. Our study found that men reported high levels of avoidant attachment, consistent with previously reported studies, and reported high levels of anxious attachment. This is in accordance with Barry et al., (2015) who also identified higher anxious attachment in men than in women. Their interpretation of their study's results is that men find it more important than women to feel cared for by their partner and to feel that their partner won't abandon them.

Several studies have used the frequency of sexual relations as indicators of sexual satisfaction (Gillespie, 2016). Therefore, the highest levels of anxious attachment reported in our sample could explain why there was an increase in sexual depression during confinement and why 28.3% of men and 20.3% of women reported being dissatisfied with the amount of sexual intercourse during the lockdown.

Another interesting detail is that the women in our study scored better in sexual self-esteem than the men, before and during confinement. Such finding is consistent with Shepler and Perrone, (2016) when indicated that women reported significantly higher levels of sexual esteem than men. Likewise, in another study higher levels of sexual self-esteem were also associated with being female (Rostosky et al., 2008). Perhaps it is because, males have higher levels of socially prescribed sexual perfectionism (the standards people believe they must meet based on cultural norms) than women, and this has shown a negative relationship with sexual self-esteem (Shepler & Perrone, 2016). In general, men are socialized to be more sexual than women and give more importance to the frequency of sex (Træen & Kvalem, 2022).

Conclusion

The main findings of this study demonstrated how low levels of insecure attachment, characteristic of secure attachment, positively correlate with higher sexual self-esteem. Moreover, we provide understanding about the significance of attachment in sexual self-esteem and, therefore, in sexual satisfaction that should be considered in clinical practice and research. There are limitations in the present study that might be addressed in future work. Since sexuality is a dyadic phenomenon, it will be important in future studies to collect data from both members of the couples being studied. A second limitation is the correlational nature of the study, which limits our ability to draw conclusions about causality. Third, the current study examined only those in heterosexual relationship and, therefore, any interpretation of the findings is limited to that subset of the population. Additionally, our approach was to investigate the effect of confinement by COVID-19 in a Spanish population, so extrapolating the results to other cultures may be limited. Another aspect to consider is that most of the participants had higher or secondary education, which may suggest that the sample population consists of middle and upper-middle socioeconomic class. On top of that, our study relied on self-report measures that may be subject to social desirability biases. Furthermore, our data were collected cross-sectionally, and they represent participant's perception of changes rather than actual differences from before to during, so it is possible that individuals cannot accurately remember or report on how they felt before the confinement, as their current feelings might bias their recollections. And finally, because most of the sample was living with their partner, these results apply primarily to those who are cohabitating.

Future research should study attachment longitudinally to determine if confinement by COVID-19 caused a change in the attachment style of those who were confined, although it is really complicated now. As previously mentioned, attachment is susceptible to inter and intrapersonal experiences and environmental situations, so it would be important to know the effects of COVID-19 on attachment. Likewise, it would be convenient to carry out studies on married and single couples during confinement.

Several studies establish there is a difference in attachment and sexual self-esteem between single or married couples, where single people consistently report worse levels of sexual self-esteem and satisfaction (Antičević et al., 2018), therefore, studying it in situations of social distancing such as the one we are experiencing, could provide valuable information. Finally, future research should compare the effect of attachment on the sexual self-esteem of heterosexual and homosexual couples. In our study, the homosexual sample size was small, so it was not representative.

Author contributions All authors contributed to the study conception and design. Material preparation was made Dagmarie Torres-Cruz. Data collection and analysis were performed by external companies. The first draft of the manuscript was written by Dagmarie Torres-Cruz and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Data repository The data that support the findings of this study are available from the corresponding author, [Dagmarie Torres-Cruz], upon reasonable request.

Declarations

Conflict of interest We confirm that there are no relevant financial or non-financial competing interests to report nor conflict of interest.

References

- Alonso-Arbiol, I., Balluerka, N., & Shaver, P. R. (2007). A Spanish version of the Experiences in Close Relationships (ECR) adult attachment questionnaire. *Personal Relationships*, 14(1), 45–63. <https://doi.org/10.1111/j.1475-6811.2006.00141.x>
- Antičević, V., Britvić, D., & Jokić-Begić, N. (2018). Attachment styles and sexuality: The contribution of gender, age and relationship status. *Socijalna Psihijatrija*, 46(2), 123–226.
- Banerjee, D., & Sathyanarayana, R. (2020). Sexuality, sexual well being, and intimacy during COVID-19 pandemic: An advocacy perspective. *Indian Journal of Psychiatry*, 62(4), 418–416. <https://doi.org/10.4103/psychiatry.IndianJPsychiatry>
- Barry, J., Seager, M., & Brown, B. (2015). Gender differences in the association between attachment style and adulthood relationship satisfaction (brief report). *New Male Studies*, 4(3), 63–74.
- Bilal, A., & Rasool, S. (2020). Marital satisfaction and satisfaction with life: Mediating role of sexual satisfaction in married women. *Journal of Psychosexual Health*, 2(1), 77–86. <https://doi.org/10.1177/2631831820912873>
- Bogaert, A. F., & Sadava, S. (2002). Adult attachment and sexual behavior. *Personal Relationship*, 9, 191–204.

Bowlby, J. (1988). A secure base: Parent-child attachment and healthy human development. Basic Books.

Brassard, A., Dupuy, E., Bergeron, S., & Shaver, P. R. (2013). Attachment insecurities and women's sexual function and satisfaction: The mediating roles of sexual self-esteem, sexual anxiety, and sexual assertiveness. *Journal of Sex Research*, 52(1), 1–10. <https://doi.org/10.1080/00224499.2013.838744>

838744

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). Guilford.

Busby, D. M., Hanna-Walker, V., & Yorgason, J. B. (2020). A closer look at attachment, sexuality, and couple relationships. *Journal of Social and Personal Relationships*, 37(4), 1362–1385. <https://doi.org/10.1177/0265407519896022>

Cassioli, E., Rossi, E., Castellini, G., Sensi, C., Mancini, M., Lelli, L., Monteleone, A. M., Ricca, V., & Stanghellini, G. (2020). Sexuality, embodiment and attachment style in anorexia nervosa. *Eating and Weight Disorders*, 25(6), 1671–1680. <https://doi.org/10.1007/s40519-019-00805-6>

Domínguez-Gil, B., Coll, E., Fernández-Ruiz, M., Corral, E., del Río, F., Zaragoza, R., Rubio, J. J., & Hernández, D. (2020). COVID-19 in Spain: Transplantation in the midst of the pandemic. *American Journal of Transplantation*, 20(9), 2593–2598. <https://doi.org/10.1111/ajt.15983>

Döring, N. (2020). How Is the COVID-19 pandemic affecting our sexualities? An overview of the current media narratives and research hypotheses. *Archives of Sexual Behavior*. <https://doi.org/10.1007/s10508-020-01790-z>

Eder, S. J., Nicholson, A. A., Stefanczyk, M. M., Pieniak, M., Martínez-Molina, J., Pešout, O., Binter, J., Smela, P., Scharnowski, F., & Steyrl, D. (2021). Securing your relationship: quality of intimate relationships during the COVID-19 pandemic can be predicted by attachment style. *Frontiers in Psychology*, 12, 1–20. <https://doi.org/10.3389/fpsyg.2021.647956>

Fuenfhausen, K. K., & Cashwell, C. S. (2013). Attachment, stress, dyadic coping, and marital satisfaction of counseling graduate students. *The Family Journal*, 21(4), 364–370. <https://doi.org/10.1177/1066480713488523>

Gentzler, A. L., & Kerns, K. A. (2004). Associations between insecure attachment and sexual experiences. *Personal Relationships*, 11(2), 249–265. <https://doi.org/10.1111/j.1475-6811.2004.00081.x>

Gillespie, B. J. (2016). Correlates of sex frequency and sexual satisfaction among partnered older adults. *Journal of Sex and Marital Therapy*, 43(5), 403–423. <https://doi.org/10.1080/0092623X.2016.1176608>

Habib, A. (2020). Vicarious Trauma and The Therapist's Sexual Self-Esteem [Alliant International University]. <https://www.proquest.com/openview/dc77341ed00c6305a1ca71e8c102da02/1?pq-origsite=gscholar&cbl=18750&diss=y>

Heinrichs, K.D. (2007). An investigation of female sexual self-esteem in heterosexual, pre-menopausal women engaged in continuous long-term relationships. In ProQuest Dissertations and Theses.

Hensel, D. J., Fortenberry, J. D., O'Sullivan, L. F., & Orr, D. P. (2011). The developmental association of sexual selfconcept with sexual behavior among adolescent women. *Journal of Adolescence*, 34(4), 675–684. <https://doi.org/10.1016/j.adolescence.2010.09.005>

Hepper, E. G., Carnelley, K. B., & Hogarth, H. A. (2006). Does that make you feel good? Attachment orientation moderates the link between sexual behaviour and sexual self-views. In Poster presented at International Association for Relationship Research conference, Crete. https://www.researchgate.net/publication/237415117_Does_That_Make_You_Feel_Good_Attachment_Orientation_Moderates_the_Link_between_Sexual_Behaviour_and_Sexual_Self-Views

Hoseinabad, S. F. H., Banab, B. G., Mashayekh, M., Sodagar, S., & Farrokhi, N. (2018). An investigation of predictive marital adjustment base of attachment styles in Iranian married women. *Journal of Community Health Research*, 7(3), 147–154.

Islam, D.-U., Bodrud-Doza, M., Khan, R. M., Haque, M. A., & Mamun, M. A. (2020). Exploring COVID-19 stress and its factors in Bangladesh: A perception-based study. *Heliyon*, 6(7), 1–10. <https://doi.org/10.1016/j.heliyon.2020.e04399>

Jacob, L., Smith, L., Butler, L., Barnett, Y., Grabovac, I., McDermott, D., Armstrong, N., Yakkundi, A., & Tully, M. A. (2020). Challenges in the practice of sexual medicine in the time of COVID-19 in the United Kingdom. *Journal of Sexual Medicine*, 17(7), 1229–1236. <https://doi.org/10.1016/j.jsxm.2020.05.001>

Karagöz, M. A., Gül, A., Borg, C., Erihan, İB., Uslu, M., Ezer, M., Erbağcı, A., Çatak, B., & Bağcıoğlu, M. (2020). Influence of COVID-19 pandemic on sexuality: A cross-sectional study among couples in Turkey. *International Journal of Impotence Research*. <https://doi.org/10.1038/s41443-020-00378-4>

Kira, I. A., Shuwiekh, H. A. M., Rice, K. G., Ashby, J. S., Elwakeel, S. A., Sous, M. S. F., Alhuwailah, A., Baali, S. B. A., Azdaou, C., Oliemat, E. M., & Jamil, H. J. (2020). Measuring COVID-19 as traumatic stress: Initial psychometrics and validation. *Journal of Loss and Trauma*. <https://doi.org/10.1080/15325024.2020.1790160>

Li, W., Li, G., Xin, C., Wang, Y., & Yang, S. (2020a). Challenges in the practice of sexual medicine in the time of COVID-19 in China. *Journal of Sexual Medicine*, 17(7), 1225–1228. <https://doi.org/10.1016/j.jsxm.2020.04.380>

Li, Z., Ge, J., Yang, M., Feng, J., Qiao, M., Jiang, R., Bi, J., Zhan, G., Xu, X., Wang, L., Zhou, Q., Zhou, C., Pan, Y., Liu, S., Zhang, H., Yang, J., Zhu, B., Hu, Y., Hashimoto, K., & Yang, C. (2020b). Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain, Behavior, and Immunity*, 88, 916–919. <https://doi.org/10.1016/j.bbi.2020.03.007>

Luetke, M., Hensel, D., Herbenick, D., & Rosenberg, M. (2020). Romantic relationship conflict due to the COVID-19 pandemic and changes in intimate and sexual behaviors in a nationally representative sample of American adults. *Journal of Sex and Marital Therapy*. <https://doi.org/10.1080/0092623X.2020.1810185>

Macleod, A., & McCabe, M. P. (2019). Defining sexuality in later life: A systematic review. *Australasian Journal on Ageing*, 39(S1), 6–15. <https://doi.org/10.1111/ajag.12741>

Meston, C. M., Rellini, A. H., & Heiman, J. R. (2006). Women's history of sexual abuse, their sexuality, and sexual self-schemas. *Journal of Consulting and Clinical Psychology*, 74(2), 229–236. <https://doi.org/10.1037/0022-006X.74.2.229>

Mikulincer, M., & Goodman, G. S. (2006). *Dynamics of romantic love*. The Guilford Press. <https://doi.org/10.1002/per.405>

Moccia, L., Janiri, D., Pepe, M., Dattoli, L., Molinaro, M., & Di, M. (2020). Affective temperament, attachment style, and the psychological impact of the COVID-19 outbreak: An early report on the Italian general population. *Brain, Behavior, and Immunity Journal*, 87, 75–79.

Offman, A., & Matheson, K. (2004). The sexual self-perceptions of young women experiencing abuse in dating relationships. *Sex Roles*, 51(9–10), 551–560. <https://doi.org/10.1007/s11199-004-5465-5>

Orgilés, M., Morales, A., Delvecchio, E., Mazzeschi, C., & Espada, J. P. (2020). Immediate psychological effects of the COVID-19 quarantine in youth from Italy and Spain. *Frontiers in Psychology*, 11, 1–10. <https://doi.org/10.3389/fpsyg.2020.579038>

Panzeri, M., Ferrucci, R., Cozza, A., & Fontanesi, L. (2020). Changes in sexuality and quality of couple relationship during the COVID-19 lockdown. *Frontiers in Psychology*, 11, 1–8. <https://doi.org/10.3389/fpsyg.2020.565823>

Peixoto, M. M., Amarelo-Pires, I., Pimentel Biscaia, M. S., & Machado, P. P. P. (2018). Sexual self-esteem, sexual functioning and sexual satisfaction in Portuguese heterosexual university students. *Psychology and Sexuality*, 9(4), 305–316. <https://doi.org/10.1080/19419899.2018.1491413>

Pietromonaco, P. R., & Barrett, L. F. (2000). The internal working models concept: What do we really know about the self in relation to others? *Review of General Psychology*, 4, 155–175. <https://doi.org/10.1037/1089-2680.4.2.155>

Pietromonaco, P. R., & Overall, N. C. (2020). Applying relationship science to evaluate how the COVID-19 pandemic may impact couples' relationships. *American Psychologist*. <https://doi.org/10.1037/amp0000714>

Potki, R., Ziaei, T., Faramarzi, M., Moosazadeh, M., & Shahhosseini, Z. (2017). Bio-psycho-social factors affecting sexual self-concept: A systematic review. *Electronic Physician*, 9(9), 5172–5178. <https://doi.org/10.19082/5172>

Rodríguez-Domínguez, C., Lafuente-Bacedoni, C., & Mercedes, D. (2021). Effect of the lockdown Due to COVID-19 on sexuality: The mediating role of sexual practices and arousal in the relationship between gender and sexual self-esteem. *Psychological Reports*. <https://doi.org/10.1177/00332941211028999>

Rodríguez-Rey, R., Garrido-Hernansaiz, H., & Collado, S. (2020). Psychological impact and associated factors during the initial stage of the Coronavirus (COVID-19) pandemic among the general population in Spain. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2020.01540>

Rostosky, S. S., Dekhtyar, O., Cupp, P. K., & Anderman, E. M. (2008). Sexual self-concept and sexual self-efficacy in adolescents: A possible clue to promoting sexual health? *Journal of Sex Research*, 45(3), 277–286. <https://doi.org/10.1080/00224490802204480>

Schachner, D. A., & Shaver, P. R. (2004). Attachment dimensions and motives for sex. *Personal Relationships*, 11, 179–195.

Shaver, P. R., & Mikulincer, M. (2006). Chapter 14: Attachment theory, individual psychodynamics, and relationship functioning attachment theory: Basic concepts. In A. Vang (Ed.), *The Cambridge handbook of personal relationships*. Cambridge Handbook of Personal Relationships (pp. 251– 272). Cambridge University Press. <https://doi.org/10.1017/CBO9780511606632.015>

Shepler, D., & Perrone, K. M. (2016). Differences in psychological distress and esteem based on sexual identity development. *College Student Journal*, 50(4), 579–589. Gale Academic OneFile, link.gale.com/apps/doc/A474548666/AONE?u=anon~40ba4fce&sid=googleScholar&xid=4bda3377.

Siegel, A., Levin, Y., & Solomon, Z. (2019). The role of attachment of each partner on marital adjustment. *Journal of Family Issues*, 40(4), 415–434. <https://doi.org/10.1177/0192513X18812005>

Soler, F., Gómez, M., Espada, J., Morales, A., Sierra, J., Marchal, L., & Vallejo, P. (2016). Adaptation and validation of the brief sexuality scale in Colombian and Spanish populations. *International Journal of Psychology and Psychological Therapy*, 16(3), 343–356.

Tavakolizadehj, J., & Rastgoo Nejad, F. (2016). Sexual self-esteem as a predictor of marital satisfaction in mothers with normal or mentally retarded children. *International Journal of Life Sciences and Pharma Research*, 1(Special Issues 1), 1–8.

Træen, B., & Kvaem, I. L. (2022). Satisfaction with singlehood and sexual activity. *Sexuality and Culture*. <https://doi.org/10.1007/s12119-022-09961-x>

Vowels, L., & Carnelley, K. (2021). Attachment styles, negotiation of goal conflict, and perceived partner support during COVID-19. *Personality and Individual Differences*, 171, 1–21. <https://doi.org/10.1016/j.paid.2020.110505>

Zarbakhsh, M., Dinani, P. T., & Rahmani, M. (2013). The relationship between sexual self-esteem and all its components with marital satisfaction in athletic women of Tehran. *European Online Journal of Natural and Social Sciences*, 2(2), 200–206.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.