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Sexting in times of confinement. An analysis of sending online sexual content before and during COVID-19 pandemic amongst university students

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Abstract: Sexting is a common practice among young adults that consists of sending material with sexual content to other people. During the COVID-19 pandemic containment situation, the main means of exploring sexuality have been through digital devices. Therefore, the purpose of this paper is to analyze the practice of sexting before and during confinement due to COVID-19 amongst Spanish university students. A longitudinal design was adopted from the application of an online survey based on three standardized and internationally used instruments on a sample of university students (n = 499) before and during confinement. The results indicated that the practice of sexting was slightly higher during confinement. At the same time, the use of dating applications was a conditioning factor in sexting. Furthermore, it was noted that sexting had a significant influence on college students' levels of self-control, depression, anxiety, and stress during confinement. Finally, the main conclusions of this study are discussed where the situation of confinement has had an impact on the lives of students and their habits of digital consumption and expression of sexuality.

Keywords: sexting, sexually explicit images, sexual behavior, psychosocial factors, university students, COVID-19

Introduction

The channels for manifesting sexuality have been progressing over time. Currently, with the advance of technology, the frontiers of communication have expanded and phenomena such as sexting have emerged. Specifically, sexting refers to sending or receiving messages, photos or videos with sexual content through digital media (Samini & Alderson, 2014). This poses a risk if the recipient decides to misuse this content, which can cause various personal and social problems for the person who has sent it and even criminal consequences for the recipient who has disseminated the content without their permission (Kopecký & Szotkowski, 2018). Some of the problem points that are present in cases of sexting are blackmail, revenge, extortion or

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child pornography crimes (Agustina & Gómez-Duran, 2016; Santisteban & Gámez-Guadix, 2017).

This phenomenon affects various groups, but mainly the most affected population is the youth (Adorjan & Ricciardelli, 2019; Machimbarrena et al., 2018; Valiukas et al., 2019), being a modern way in which adolescents can experiment with sexual identity (Eleuteri, Saladino, & Verrastro, 2017). Thus, sending multimedia material with sexual content has become a common practice among young people (Ojeda, Del-Rey, Walrave, & Vandebosch, 2020), where not only do young people generate their own material but also forward content from other known and unknown people via instant messaging, as in the case with WhatsApp groups (Rodríguez-Castro et al., 2017). Furthermore, the consumption of dating applications by this group has grown as one of the main means of getting to know another person (Niehuis et al., 2020), which increases the possibilities of sexting as a previous step to meet in person (Schreurs, Sumter, & Vandenbosch, 2020).

This exchange, although risky, is a cultural dimension used by young people to avoid feelings of shame or the pressure of face-to-face sexual intimacy, which gives the person who engages in it a certain security because it is outside the presence of the other person (Wolak & Finkhelor, 2011). In contrast, the practice of sexting has begun to be linked to the presence of symptoms such as depression or anxiety (Gámez-Guadix & Santisteban, 2018; Mori, Temple, Browne, & Madigan, 2019; Ruiz et al., 2021) and with the aggravation of social problems such as sexual assaults on women (Dir, Riley, Cyders, & Smith, 2018; Morelli et al., 2016). Therefore, the analysis of sexting practices in the youth population is a matter of interest to alleviate some of the problems that exist in the society of the 21st century.

In this line we show some studies that have linked sexting with the development of depressive symptoms and anxiety in Spanish university students (Gassó, Agustina, Mueller-Johnson, & Montiel, 2019; Gassó, Mueller-Johnson, & Montiel, 2020); the association of sexting with depressive symptoms and suicidal ideas in Mexican university students (Jassó, López, & Gámez-Guadix, 2017); the prevalence of social pressure to perform sexting and its possible relation to self-control in South Korean students (Lee, Moak, & Walker, 2016); the relationship of sexting with sensation-seeking and depression in Belgian students (Van Ouytsel, Van Gool, Ponnet, & Walrave, 2014); the associations of sexting with self-control and self-esteem in students in Germany, the Netherlands and Thailand, where increased self-control and self-esteem decreased the likelihood of sending sexual content (Wachs, Wright, & Wolf, 2017); and the increase in sexting influenced by the period of confinement resulting from the COVID-19 pandemic (Eleuteri & Terzitta, 2021; Lehmiller, Garcia, Gesselman, & Mark, 2021).

On the other hand, the practice of sexting has been exacerbated by the exceptional situation of confinement caused by COVID-19 (Nelson et al., 2020; Thomas, Binder, & Matthes, 2021). During confinement the use of digital media has been the only way to interact with others outside the home. This has meant that one of the main ways in which sexuality has been explored has been through digital devices (Vendemia & Coduto, 2022). Some research conducted during the pandemic period has noted a higher prevalence of sexting among Belgian adolescents at times of increased social blockage, finding significant links with stress (Maes & Vandenbosch, 2022). Meanwhile, other studies report that there were no notable differences between young people in the practice of sexting before and during the pandemic in California (USA) (Yarger et al., 2021). And in the case of Spain, the study by Gassó et al. (2021) showed that participation in sexting decreased during confinement despite increased Internet use.

Based on the scientific literature, we addressed the issue of whether sexting has increased as a result of the COVID-19 confinement period, establishing the following hypothesis: Has the COVID-19 pandemic increased the practice of sexting in young adults? In turn, this research aimed to analyse the practice of sexting before and during the COVID-19 confinement in Spanish university students. The research questions posed and based on the previous background were:

RQ1: Were there significant differences in the practice of sexting among the university population before and during confinement?
RQ2: What sociodemographic factors influenced the practice of sexting before and during confinement?
RQ3: Did the practice of sexting influence the levels of depression, anxiety, stress and self-control before and during confinement?

Methodology

Participants and procedure

A longitudinal design was used in a sample of Spanish university students (n = 499). The initial selection of participants was based on a convenience sample, where an online survey was applied to the university student population through the official distribution channels of the University of Granada. All participants gave their informed consent.

The data collection period had two moments, a first data collection that lasted from October to December 2019 and a second data collection that took place from April to May 2020, coinciding with the confinement stage in Spain.

Initially the sample was composed of 732 students in the first data collection. However, only 499 students responded to the survey again. Therefore 233 incomplete cases were ruled out. Thus the sample consisted of 125 men and 374 women, aged between 18 and 35 (M = 21.57; SD = 5.68) (Table 1).

Table 1
Socio-demographic data

Variable	***n***	**%**
Gender		
Male	125	25.1
Female	374	74.9
Age		
≤ 20	200	40.1
21-35	299	59.9
Marital status		
Single	300	60.1
Couple	199	39.9
Lives with parents		
Yes	251	50.3
No	248	49.7
Sexual orientation		
Heterosexual	376	75.4
Homosexual or Bisexual	123	24.6
Dating apps		
Yes	54	10.8
No	445	89.2

Measures

- ***Sociodemographic measures.*** The sociodemographic variables analyzed were extracted from previous studies that related each one of them to sexting. Thus we included gender and age (Dir & Cyders, 2015), having a partner (Currin & Hubach, 2017), sexual orientation (Gámez-Guadix, Almendros, Borrajo, & Calvete, 2015) and two more variables that were of interest in the study linked to personal habits, such as living with parents and the use of dating applications.
- ***Sexting Behaviors Scale (SBS)***. Sexting behavior was evaluated through the Sexting Behaviors Scale (SBS) (Dir, 2012). This scale has been validated and adapted in the Spanish context (Chacón-López, Romero-Barriga, & Caurcel-Cara, 2018). For this study we applied the dimension of active disposition towards sexting composed of 9 items based on a 5-point Likert scale ranging from 1 (never) to 5 (frequently or daily). Responses to elements are summed, where scores range from 9 to 45. A higher score is associated with an active disposition towards sexting. SBS has demonstrated good psychometric properties (Morelli et al., 2016) and the internal consistency for this sample was adequate (Cronbach's $\alpha = .89$).
- ***Brief Self-Control Scale (BSCS-SV)***. The self-control was evaluated on the basis of the Brief Self-Control Scale (BSCS-SV) (Tangney et al., 2004). This scale has been validated and adapted to Spanish (Del-Valle et al., 2019). The scale includes 13 items where participants respond according to their degree of agreement on a 5-point Likert scale, from 1 (not at all) to 5 (completely). The scores are summed up and range from 13 to 65 points, with a higher score being associated with lower self-control. BSCS-SV has adequate psychometric properties (Hinojo et al., 2020) and for this sample it obtained excellent reliability (Cronbach's $\alpha = .87$).
- ***Depression, Anxiety and Stress Scale (DASS-21)***. Depression, anxiety, and stress were evaluated with the Depression, Anxiety, and Stress Scale (DASS-21) (Antony, Bieling, Cox, Enns, & Swinson, 1998). This scale has been validated and adapted in Spain (Ruiz, García-Martín, Suárez-Falcón, & Odriozola-González, 2017). The scale includes 21 items divided into three dimensions with 7 items each, which refer to depression, anxiety and stress. Participants respond to items based on their occurrence during the previous week using a 4-level Likert scale: from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). The scores are summed, where a higher score indicates the presence of each dimension, ranging from 0 to 21 points for each scale. DASS-21 has excellent psychometric properties (Liu et al., 2018) and reliability for this study was good (Cronbach's α's for the depression, anxiety, and stress dimensions were .91, .87, and .86, respectively).

Statistical analysis

The data were analyzed with the statistical program SPSS and AMOS, version 25. T-test was applied to examine differences between groups. A value of $p < 0.05$ was considered statistically significant. On the other hand, Multivariate Analysis of Covariance (MANCOVA) was used to check the significant differences between the sociodemographic factors based on the practice of sexting and by groups. Finally, a path analysis was performed where a Multi-Group Structural Equation Modeling (MG-SEM) was established to check the influence of sociodemographic factors with the sexting, and in turn the sexting with the variables self-control, depression, anxiety and stress, before and during confinement. To confirm the hypothesis of multivariate normality, the Mardia coefficient was used (Mardia, 1970).

Results

T-test showed that there were no significant differences in college students during the two applications of the instrument (before and during confinement) (Table 2). However, higher average scores were obtained during confinement in all dimensions except self-control.

Table 2
Test t in the different dimensions based on the stage of confinement

Dimension	Confinement	Mean	SD	t	df	*p*
Sexting	Before	16.20	6.753	.609	996	.542
	During	16.25	6.472			
Self-control	Before	37.10	5.578	.129	996	.897
	During	36.88	5.847			
Depression	Before	7.86	6.140	-.961	996	.337
	During	8.38	6.185			
Anxiety	Before	6.45	5.456	-1.602	996	.109
	During	7.02	5.762			
Stress	Before	9.63	5.311	-1.341	996	.180
	During	9.95	5.488			

Note: n = 499.

Differences between groups were analysed using the one-way MANCOVA, which revealed that no differences between groups were assumed (Table 3). This meant that no significant differences were found between students in the combined dependent variables after controlling for the sexting and confinement variables (F-statistic = 1.018; p = .424, Wilks 'Λ = .851). The highest average sexting scores were found in men before confinement (M = 17.90) and women during confinement (M = 16.35). In relation to age, the highest average was in the population of 21-35 years (M = 16.42 before; M = 16.75 during). Having a partner also meant a greater willingness to sext (M = 16.82 before; M = 16.37 during), along with not living with the parents (M = 16.42 before; M = 16.61 during). Homosexual or bisexual students also scored higher (M = 18 before; M = 17.05 during). Finally, students who used dating applications obtained the highest averages in sexting (M = 20.30 before; M = 18.19 during).

Table 3
Descriptive statistics of the independent variables on the sexting scale before and during confinement

Variables	Before		During		
	M	*SD*	*M*	*SD*	*p*
Gender					
Male	17.90	.612	15.74	.644	.51
Female	15.70	.323	16.35	.341	
Age					
≤ 20	16	.441	15.37	.435	.802
21-35	16.42	.383	16.75	.410	
Marital status					
Single	15.87	.367	16.08	.398	.886
Couple	16.82	.469	16.37	.465	
Lives with parents					
Yes	16.08	.428	15.78	.401	.336
No	16.42	.391	16.61	.452	
Sexual orientation					
Heterosexual	15.68	.311	15.92	.344	.499
Homosexual or Bisexual	18	.669	17.05	.628	

Dating apps					
Yes	20.30	1.009	18.19	1.185	.172
No	15.76	.293	15.96	.306	

Note: *p* calculated through MANCOVA test.

The hypothesis of multivariate normality was fulfilled in both models, as a precondition for the establishment of MG-SEM. For the pre- confinement model the Mardia coefficient obtained a value of 1.796 and for the confinement model the value was 2.448. Both values were lower than 1,935, as a result of the multiplication of the total variables by the total variables + 2 according to the formula established for this procedure (Bollen & Long, 1993). As for the goodness-of-fit indexes of the models, appropriate values were obtained in both (Byrne, 2013) (Table 4).

Table 4
Goodness of fit measure

Fit indices	**Obtained values**		**Criteria**
	Before	**During**	
χ^2	46.42	19.95	
df	21	21	
χ^2/df	2.21	.95	≤ 3
GFI	.98	.99	≥ .90
RMSEA	.04	.00	< .05
NFI	.96	.98	≥ .90
CFI	.97	1	≥ .90
AGFI	.94	.97	≥ .90
SRMR	.04	.02	< .08

Note: GFI = Goodness-of-Fit Index; RMSEA = Root Mean Squared Error of Approximation; NFI = Normalised Fit Index; CFI = Comparative Fit Index; AGFI = Adjusted Goodness-of-Fit Index; SRMR = Standardized Root Mean Square Residual.

Regarding MG-SEM estimates (Table 5), the significant influence of gender was established in the pre-confinement sexting model (p = .004), marital status (p = .012), sexual orientation (p = .005), and dating apps (p = < .001). While in the confinement sexting model only dating apps were significant (p = .039). In turn, in the pre-confinement model, the practice of sexting significantly influenced in self-control (p = < .001), depression (p = .017), and stress (p = .005). In contrast, in the model generated during the confinement, the practice was significantly influenced in all dimensions (p = < .001).

Table 5
Parameter estimates of final model

Model	Relation	Cov	SE	CR	*p*	SRW
1	Gender → Sexting	-1.863	.647	-2.879	.004	-.125
	Age → Sexting	.046	.583	.079	.937	.003
	Marital status → Sexting	1.446	.575	2.516	.012	.110
	Living with parents → Sexting	-.112	.571	-.197	.844	-.009
	Sexual orientation → Sexting	1.828	.656	2.788	.005	.122
	Dating apps → Sexting	-4.022	.923	-4.354	***	-.193
	Sexting → Self-control	.179	.038	4.743	***	.208
	Sexting → Depression	.099	.042	2.381	.017	.106
	Sexting → Anxiety	.053	.038	1.395	.163	.062
	Sexting → Stress	.102	.037	2.793	.005	.124

2	Gender → Sexting	.878	.697	1.261	.207	.056
	Age → Sexting	1.187	.628	1.891	.059	.086
	Marital status → Sexting	.292	.619	.471	.637	.021
	Living with parents → Sexting	.437	.614	.712	.476	.032
	Sexual orientation → Sexting	.855	.707	1.210	.226	.055
	Dating apps → Sexting	-2.058	.995	-2.068	.039	-.095
	Sexting → Self-control	.236	.037	6.310	***	.272
	Sexting → Depression	.190	.040	4.725	***	.208
	Sexting → Anxiety	.206	.037	5.542	***	.241
	Sexting → Stress	.171	.036	4.816	***	.211

Note: 1 = Pre-confinement; 2 = Confinement; Cov = covariance; SE = standard error; CR = critical radio; SRW = standardized regression weights; ***$p < 0.001$.

The structural equation model estimates for the pre- confinement sexting model reflected the significant influence of four independent variables on sexting practice and, in turn, sexting in three psychosocial dimensions of the study (Figure 1). The coefficient of determination for sexting was 8.6% (R^2 = .086), self-control was 4.8% (R^2 = .048), depression was 1.3% (R^2 = .013), anxiety was .4% (R^2 = .004), and stress was 1.5% (R^2 = .015).

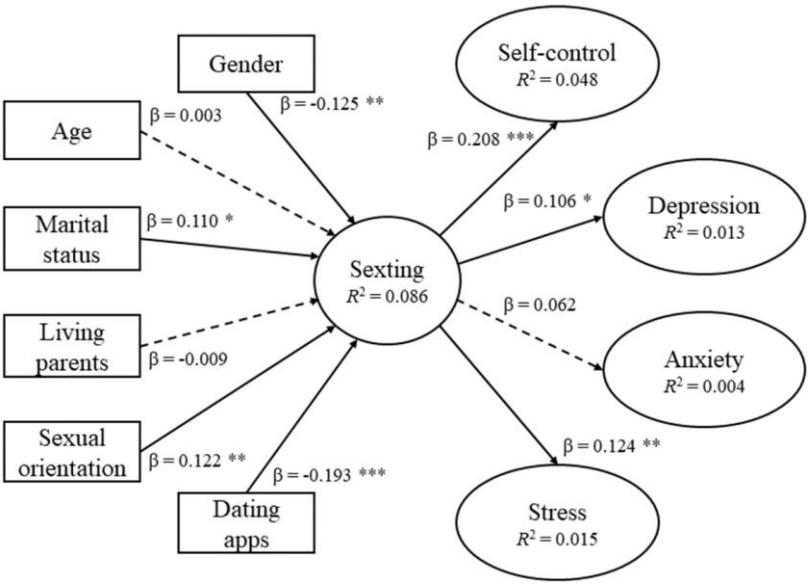

Figure 1. Pre-confinement's structural equation model estimates. Note: β = standardized direct effect; *$p < .05$; **$p < .01$; ***$p < .001$. Discontinuous arrow = not significant.

On the other hand, structural equation model estimates for the sexting model during confinement reflected the significant influence of an independent variable on sexting practice. While sexting significantly influenced the four psychosocial dimensions of the study (Figure 2). The coefficient of determination for sexting was 2.7% (R^2 = .027), self-control was 7.5% (R^2 = .075), depression was 4.1% (R^2 = .041), anxiety was 5.8% (R^2 = .058), and stress was 4.5% (R^2 = .045).

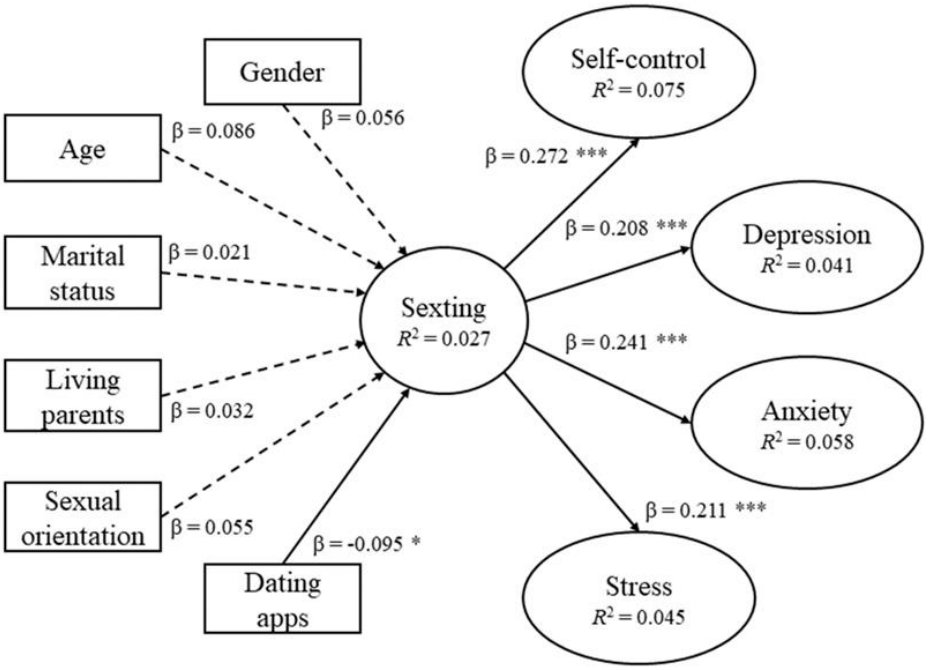

Figure 2. Confinement's structural equation model estimates. Note: β = standardized direct effect; *p < .05; ***p < .001. Discontinuous arrow = not significant.

Discussion

The results showed an active disposition towards sexting that was similar in both time periods. Therefore, sexting in the university student population was an established practice (Ojeda et al., 2020), regardless of the changes produced by the COVID-19 pandemic in line with data obtained by Yager et al. (2021) in young Americans. In this respect, there were no differences before and during the confinement in any variable (RQ1). However, the highest averages in the different dimensions of the study were during the period of confinement, except in self-monitoring. This implied that sexting was slightly higher during confinement (Eleuteri & Terzitta, 2021; Lehmiller et al., 2021; Nelson et al., 2020), in contrast to Gassó et al. (2021) who indicated that sexting decreased in the Spanish youth population. In turn, levels of depression, anxiety and stress were also higher.

The uncertainty generated by COVID-19 has had a significant influence on the social and personal life of university students, and some of these inferences can be contrasted with the data obtained. Nevertheless, it is curious that self-control was greater during confinement, such university students were able to self-control certain impulses in this exceptional situation.

It was noted that before confinement it was men who were more actively disposed towards sexting than women. This changed during confinement, where women outperformed men in average scores. An interesting debate is therefore established where the gender differences were found to be present (Dir & Cyders, 2015). Thus, the female population increased the performance of this practice in the confinement stage as a means of self-expression of sexuality, through digital devices as the main means of communication.

In relation to age, the highest average was in the 21-35 year-old population before and during confinement. Therefore sexting tends to be more common in young adults (Adorjan & Ricciardelli, 2019; Machimbarrena et al., 2018; Valiukas et al., 2019). In turn, having a partner also meant a greater active disposition towards sexting (Currin & Hubach, 2017). This was increased by the situation of confinement, where at the most restrictive time's couples could not have physical contact if they did not live together. Thus the practice of sexting has been increased.

On the other hand, the fact of not living with the parents has conditioned the sexting, where students living outside the family home obtained higher averages. This fact was compounded during the confinement. Thus, a space of privacy is generated by living without parental supervision, which provides a certain autonomy and freedom to students to express their sexuality through digital media.

As other studies have pointed out, students with a sexual condition other than heterosexuality are more likely to engage in practices such as sexting (Gámez-Guadix et al., 2015). This was confirmed in both periods, where homosexual or bisexual students had higher average scores. Therefore, the exploration of sexuality through digital media was higher among people of the same sex.

Another aspect of interest was the use of dating applications, which were one of the main channels for meeting another person during confinement (Niehuis et al., 2020). Its use was associated with a greater predisposition to sexting, which allowed students to disseminate and receive sexual content with another person (Schreurs, Sumter, & Vandenbosch, 2020), during the period of confinement (RQ2).

The biggest differences in the study were found in the path analysis. The pre-confinement sexting model reflected the influence of gender, marital status, sexual orientation, and dating apps as predictors of sexting. However, the model of sexting during confinement only confirmed the use of dating applications. The only conditioning factor of the sexting was the use of this type of applications, since it was a practice repeated in time at two totally different moments. At the same time, during confinement, sexting influenced the psychosocial status of college students along the same lines as previous studies regarding levels of self-control (Lee, Moak, & Walker, 2016; Wachs, Wright, & Wolf, 2017), depression (Gámez-Guadix & Santisteban, 2018; Jassó, López, & Gámez-Guadix, 2017; Mori et al, 2019; Van Ouytsel et al., 2014), anxiety (Gassó et al., 2019; Gassó, Mueller-Johnson, & Montiel, 2020). To which the stress variable is added. It should be noted that anxiety was not influenced before this period, such confinement was somewhat linked to its incidence (RQ3), as noted in previous studies (Maes & Vandenbosch, 2022).

In summary, despite the exceptional moment experienced by the COVID-19 pandemic, the practice of sexting has been one of the main channels for the expression of sexuality in the most restrictive moments of citizen mobility.

Limitations

Sample loss after the second application is highlighted as a limitation of the study. From the initial sample of 732, 499 cases were finally analysed. However, this sample size was representative of the population of university students. Another limitation was associated with the use of certain independent variables, which were specified according to the scientific literature and based on the researchers' criteria. In future studies it would be interesting to specify some more to see if they influence the practice of sexting.

Finally, data collection during confinement also encountered some difficulty, as this was an exceptional situation where all the procedures of the present investigation had to be adapted.

Conclusion

Sexting is a common practice among young adults that may carry certain risks for the individuals who engage in it and those who forward the material to others, as indicated by previous studies. It is becoming an everyday occurrence to receive material with sexual content through instant messaging groups, not knowing at times that sharing images or videos of others without their consent may be a crime.

During the COVID-19 situation, sexting has increased slightly, although student participation in this practice is still common. The aim of this study was to analyse the practice of sexting before and during COVID-19 confinement among Spanish university students, where interesting data on this issue were collected. At the same time, answers were given to the different research questions, highlighting the following factors as predictors of sexting before confinement: gender, marital status, sexual orientation and dating apps. And the influence of sexting on self-control, depression and stress. However, during confinement only the use of dating apps was influential as a predictor. While sexting had a significant influence on self-control, depression, anxiety and stress. However, the hypothesis posed as to whether the COVID-19 pandemic has increased sexting among young adults was refuted as there was no significant difference to empirically affirm this fact.

Finally, the impact of COVID-19 on the lives of students and on their habits of digital consumption and expression of sexuality is an interesting line of research to quantify the changes that have taken place during the period of confinement.

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