The Phenomenon of Sexting Among Mexican and Spanish University Students: A Multigroup Model

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Abstract

The practice of sexting is a phenomenon that has been growing in recent times due to the use of technology and the advance of mobile devices. This practice can have negative consequences for young people who practice it without knowing the risk involved. The main objectives of this paper were to analyze sexting behavior in Mexican and Spanish university students, and to determine the possible sociodemographic factors that influence sexting practice in order to generate explanatory models. A cross-sectional study design was adopted by applying an online survey to a sample of 781 university students. The students belonged to two different institutions, 394 from a Mexican university and 387 from a Spanish university. The results indicated that the practice of sexting was higher in Spanish university students and there were significant differences between the two populations. Furthermore, the model generated on sexting indicated that the country, gender, sexual orientation and use of dating applications were possible predictors of this phenomenon. At the same time, the practice of sexting had a possible influence on students' levels of depression and stress. Finally, the data and findings obtained showed relevant data on the practice of sexting in Mexican and Spanish students and on the sociodemographic factors that can be influential.

Keywords Sexting · Sexually explicit images · Sexual behaviors · Computer-mediated behavior · University students

Introduction

Interaction with technologies and the Internet in most young people is a positive experience, as is the use of electronic devices to consolidate and build new learning in different fields of higher education, among other beneficial practices

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(Rodríguez-Ríos et al. 2020; Smith et al. 2016). These experiences are related to unlimited access to information, knowledge and culture, new ways of relating, as well as the possibility of having an active participation in society. However, in the excessive interaction with technologies there are a series of risks among them, cyberbullying, low quality of sleep, low mental well-being, access to pornographic content, sexual harassment, sexting, which can lead to risky sexual practices (Alfaro-González et al. 2015; Bilgrami et al. 2017; Clark et al. 2018).

It is important to conceptualize this practice in order to know the scope it can reach. Mercado-Contreras et al. (2015) define it as "the exchange of messages in some private conversation (inbox) through some electronic means, with explicit or implicit sexual content, either with text and/or image created by the author, where it is considered to be shown naked or semi-nude" (p. 14). That is, the practice of sexting refers to the behaviors of sending, receiving or forwarding photos, semi-nude or nude videos, from the mobile device. Reasons can vary, from pressure from a partner or another user to distance between people (Ahern and Mechling 2013; Currin et al. 2020; Smith et al. 2016). Similarly, sexting is also considered to be the sending of text messages that incorporate erotic, suggestive and explicit language (Currin et al. 2020). Sexting can be problematic when it comes to pressure, rather than agreement between a couple.

Although sexting can be considered a normal form of interaction and communication in the new generations (Gámez-Guadix and de Santisteban, 2018), studies warn of the problems that this practice can bring (Dir et al. 2018), which may be related to mental health problems such as depression, anxiety, and stress (Dodaj et al. 2020; Gassó et al. 2020; Mori et al. 2019). Furthermore, the literature proposes to develop more research regarding sociodemographic data and its influence on sexting (Kosenko et al. 2017). It is important to investigate the reasons for this relationship between depression, anxiety, and stress.

Literature Review

The excessive use of the Internet can bring behavioural problems, where the practice of sexting stands out among the most significant problems carried out by the youth population (Alfaro-González et al. 2015; Valdez-Montero et al. 2019). Sexting in young people can be predictive of certain risk behaviors such as a high number of sexual partners, avoiding condom use (whether for vaginal, anal, or oral sex), and drug and/or alcohol use before sexual encounters (Konsti-Laakso 2017; Smith et al. 2016; Valdez-Montero et al. 2019). Ahern and Mechling (2013) indicate that, in the youth population, there can also be consequences of shame and guilt, early sexual behavior, bullying, incarceration, substance abuse, depression and suicide. The issue is alarming, considering that there is a risk of child sexual exploitation when performed on minors (Kopecký 2017). Much of this problem has to do with when sexual content goes beyond the control of the sender and receiver.

Another problematic situation within this practice is the pressure that some people receive for doing so, such as blackmail and virtual harassment for the dissemination of sexual content without consent, causing various emotional problems in the

victim. In this regard, it has been found that sexting in adolescents is transversally associated with a series of health risk behaviours, in the same way they experience pressure from their partners and emotional difficulties derived from sharing the content beyond the intended recipient, i.e. not consensual (Gassó et al. 2019; Rey et al. 2019). It is therefore suggested that these practices be made visible and that intervention plans be implemented to prevent situations of cyberbullying, due to the improper use of the images sent, at the same time that they should be a subject present in the reporting systems, in order to punish people who spread this type of image, video or text without the consent of the other person (Arias-Cerón et al. 2018; Madigan et al. 2018; Van Ouytsel et al. 2015).

Therefore, an effective way to reduce emotional damage from sexting is to talk about it and establish channels of complaint for sharing content without consent. Ahern and Mechling (2013) indicate that their criminalization is not a guide to the prevention of this behavior. Therefore, it is suggested that there should be evaluation, orientation and education of the youth population regarding the consequences of this practice. In other words, it is necessary to make known what sexting is, what it is, harassment, blackmail, why it is practiced, and the associated problems (Alonso-Ruido et al. 2018). More research on the factors and other related affects is needed to achieve this type of intervention.

Previous studies have investigated the factors that predict this practice. It has been found that it is more frequent in adults than in adolescents, and that women send more than men. The positive attitude of this practice may be influenced by the approval of others and possible pressure, especially on women (Alonso-Ruido et al. 2018; Courtice and Shaughnessy 2017; Klettke et al. 2014). It is also observed more often in carrying out with the sentimental partner than with casual people. It is important to note that sexually active adolescents report more frequently this practice (Handschuh et al. 2019). Evidence in the literature also shows that it is more often done through mobile phones, as mass access to smartphones has made it easier to share privacy than ever before (Madigan et al. 2018). On the other hand, Arias-Cerón et al. (2018) found that this practice is more frequent in men. Gámez-Guadix and de Santisteban (2018), showed that sex or sexual orientation is not a determining factor, but it is related to the level of impulsivity, negative urges and depression. Marengo et al. (2019) argue that women and homosexuals are often more exposed to this practice. Other research explains that this is due to the freedom to interact in social networks with less possibility of being discriminated against (Gámez-Guadix et al. 2017).

Other factors that have been reported in the literature that may influence the practice of sexting include marital status, living with parents, religion, and use of social media. No statistical significance has been found regarding marital status or age (Silva et al. 2016), unlike Sesar et al. (2019) who report greater practice of sexting in young adults and stable partners. Another factor has to do with parental control, as it has been shown that permissive parental style is associated with a higher probability of sexting, as well as excessive use of social networks (Dolev-Cohen and Ricon 2020; Molla-Esparza et al. 2020), and dating applications (Albury and Byron 2014). Other studies also show that young people living with parents were less likely to resort to sexting (Wong et al.

2019). Another factor is religious belief, for example, Atwood et al. (2017) report that more religious teens were less likely to engage in risky Internet practices.

As mentioned above, several studies show the relationship between the practice of sexting and the development of emotional problems such as depression, anxiety and stress. Sexting itself is not an indicator of poor psychological health, but it is related to the practice of high-risk behaviors (Temple et al. 2014), and the evidence of depression, anxiety, and trauma is due to the pressure an individual exerts to obtain sexual content from someone else (Drouin et al. 2015). Contrary to Van Ouytsel et al. (2014), who found a significant relationship with depression. Similarly, anxiety has been found to be indirectly associated with sexting because of the difficulty of controlling impulses when in a situation of emotional distress (Trub and Starks 2017). Just as it can be caused by situations of pressure or coercion (Hong et al. 2020). High levels of stress have been associated with people who send this type of content, especially in men (Klettke et al. 2018).

Particularly recent studies in Mexico have identified that those students who interact with online sexual content about fantasies, fetishes, and sexual violence are more likely to engage in sexual risk behavior (Smith et al. 2016). While in Spain, it was found that the practice of sexting in university students is part of their relationship as a couple, where sending sexually suggestive materials is part of the desire to show off, be visible to their partner, however there is a risk that these materials are misused and end up affecting the person, for example, through cyberbullying (Kopecký 2014).

In this context, this study was conducted within a Mexican university and a Spanish university in order to (i) analyze the frequency of sexting behavior in Mexican and Spanish university students; (ii) determine the possible sociodemographic factors that influence sexting in Mexican and Spanish students; (iii) establish the correlations between sexting, depression, anxiety and stress; and (iv) generate a possible explanatory model of sexting. Therefore, the research questions posed were the following:

- RQ1. How often do Mexican and Spanish university students practice sexting?
- RQ2. Are there significant differences in the practice of sexting between Mexican and Spanish university students?
- RQ3. Are there significant differences in the practice of sexting between the Mexican and Spanish university population depending on sociodemographic factors?
- RQ4. Do sociodemographic factors possible influence the practice of sexting?
- RQ5. Is there a statistically significant correlation between sexting, depression, anxiety and stress?

Methods

Participants and Procedure

Data for this study was collected between October and December 2019. The sample corresponded to university students from the Tecnológico de Monterrey (Nuevo

León, Mexico) and the University of Granada (Andalusia, Spain) (n = 781). These populations were comparable due to the socioeconomic similarity of the students and between the institutions, because both contemplate a similar academic offer (Aznar-Díaz et al. 2020).

The Mexican sample included 181 men and 213 women aged between 18 and 47 years (M = 19.98; SD = 4.07), while the Spanish sample was composed of 104 men and 283 women between the ages of 18 and 58 (M = 22.89; SD = 5.62). The research was conducted based on a convenience sampling design. A cross-sectional study design was adopted through a self-administered survey disseminated at both universities through Google forms. The participants answered the questionnaire voluntarily and anonymously, both to the questions asked to obtain socio-demographic data and to the response to the items on two standardized psychometric scales. Before answering the scale, participants gave their informed consent. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The research has been approved by the Research Ethics Committee of the University of Granada (No. 1718/CEIH/2020). Table 1 shows the participants' socio-demographic data.

Measures

Sociodemographic Measures

The socio-demographic variables analysed were gender, age, personal marital status, marital status of parents, having siblings, position between siblings, living in the parents' home, having children, religious beliefs, sexual orientation, using social networks, having dating applications and the type of electronic device used. For the categorization of the ranges of the age variable, we chose to use the division established by the World Health Organization (WHO 2017), which establishes the following ranges: < 20 teenagers, 21–35 young adult and, > 36 older adult.

Sexting Behaviour Scale (SBS)

The Sexting Behaviour Scale (SBC) was used to measure sexting behaviours (Dir 2012), adapted to Spanish by Chacón-López et al. (2018). The scale is made up of 29 items. However, for this study we applied the dimension of active disposition towards sexting, composed of nine items evaluated on a Likert scale from 1: neve to 5: frequently. Therefore, the minimum score obtained can be 9 and the maximum 45. The reliability results of this study present a high internal consistency (Lozano-Rodriguez et al. 2016). In this study, high reliability scores were also obtained for both the Mexican and Spanish populations. (Mexican sample; Cronbach's a = .90; Spanish sample; Cronbach's a = .89). (Total sample Cronbach's a = .89).

Table 1 Socio-demographic data

	Mexico		Spain	
	n	*%*	*n*	*%*
Gender				
Male	181	45.93	104	26.87
Female	213	54.07	283	73.13
Age				
< 20	327	82.99	153	39.53
21–35	60	15.22	218	56.33
> 36	7	1.77	16	4.13
Marital status				
Single	375	95.17	213	55.04
Couple	8	2.04	158	40.83
Married	7	1.77	11	2.84
Divorced	4	1.02	5	1.29
Parents marital status				
Couple	8	2.03	2	0.51
Married	299	75.88	283	73.1
Divorced	69	17.51	71	18.34
One parent deceased	17	4.31	26	6.71
Both parents deceased	1	0.25	5	1.29
Siblings				
Yes	364	92.39	353	91.21
No	30	7.61	34	8.79
Position between siblings				
First	190	48.22	181	46.78
Second	127	32.24	147	37.98
Third	56	14.21	44	11.37
Fourth	15	3.80	8	2.07
Fifth	6	1.53	7	1.80
Lives with parents				
Yes	283	71.83	196	50.65
No	111	28.17	191	49.35
Children				
Yes	17	4.32	14	3.61
No	377	95.68	373	96.39
Religious beliefs				
Yes	309	78.43	148	38.24
No	85	21.57	239	61.76
Sexual orientation				
Heterosexual	363	92.14	295	76.22
Homosexual	7	1.77	23	5.95
Bisexual	24	6.09	69	17.83
Social networks use				
Yes	394	100.00	381	98.44

Table 1 (continued)

	Mexico		Spain	
	n	*%*	*n*	*%*
No	0	0.00	6	1.56
Dating apps				
Yes	27	6.85	36	9.30
No	367	92.38	351	9.69
Electronic device				
Computer	19	4.82	17	4.39
Laptop computer	117	29.69	130	33.59
Smartphone	250	63.45	235	60.73
Tablet	8	2.04	5	1.29

Depression, Anxiety and Stress Scale (DASS-21)

The DASS-21 scale (Antony et al. 1998), adapted to Spanish by Ruiz et al. (2017) measures three dimensions: depression, anxiety and stress. Items are answered on a scale of 0 to 3, where 0 indicates no occurrence and 3 indicates much occurrence. To evaluate the results, the scores can be summed separately for each of the subscales, or by adding up the scores of all the items to obtain an overall indicator of emotional symptoms. This scale has good psychometric properties, due to its high use to measure these constructs (Liu et al. 2018; Gade et al. 2019). In relation to the grouping by item of each dimension and the reliability obtained, (i) depression groups items 3, 5, 10, 13, 16, 17 and 21 (Mexican depression Cronbach's a = .90; Spanish depression Cronbach's a = .91; total sample depression Cronbach's a = .91). (ii) Anxiety is conformed by items 2, 4, 7, 9, 15, 19, and 20 (Mexican anxiety Cronbach's a = .83; Spanish anxiety Cronbach's a = .87; total sample anxiety Cronbach's a = .85). And (iii) stress integrates the items: 1, 6, 8, 11, 12, 14, and 18 (Mexican stress Cronbach's a = .86; Spanish stress Cronbach's a = .85; total sample stress Cronbach's a = .86). The overall internal consistency in this study was high (Mexican sample Cronbach's a = .94; Spanish sample Cronbach's a = .94; total sample Cronbach's a = .94).

Data Analysis

To analyze the data obtained, descriptive and inferential statistical tests were used to answer the research questions. Central tendency and dispersion measures were calculated in order to know the general results by scale and the Mardia coefficient to check the multivariate normality of the data (Mardia 1970). The T test was applied to independent samples in order to know the possible existence of significant differences between the Mexican and Spanish populations for each scale. The MANCOVA test also verified possible significant differences in terms of sociodemographic data. Subsequently, the possible influence of sociodemographic factors on sexting was verified by establishing a linear regression model. Finally, the

relationships generated between the different constructs were calculated using Multi-Group Structural Equation Modeling (MG-SEM), taking into account the socio-demographic data of significance for sexting extracted from the linear regression model. Data was analyzed using IBM SPSS and IBM SPSS Amos Version 24 statistical programs.

Results

The t test was used to identify the existence of significant differences with respect to the practice of sexting in Mexican students and Spanish students. The results showed a p value < .001, so there are significant differences between the samples of Mexicans and Spaniards in the practice of sexting (Table 2). In this regard, the results indicated that this practice is more frequent in Spanish students (M = 16.17), than in Mexican students (M = 12.89). Regarding the DASS-21 scale, significant differences were observed in the depression dimension (p = .001), where the Spanish sample shows a higher rate (M = 7.42) than the Mexican sample (M = 6.03). In the case of the anxiety dimension, no significant differences were evident, since the p value was greater than .05 (p = .909). The same occurred with the stress dimension (p = .090).

The differences between groups were analyzed using the one-way MANCOVA, which was statistically significant. This meant that significant differences were found between countries in the combined dependent variables after controlling for the sexting variable (F-statistic = 34.162; p < .001, Wilks' Λ = .633). This value allowed us to examine comparisons between groups, where significant differences were shown in terms of gender (p < .001), age (p < .001), marital status (p < .001), lives with parents (p = .038), religious belief (p < .001), sexual orientation (p < .001), and number of social networks (p = .009) (Table 3). Thus, for each significant dependent variable the results indicated greater sexting practice in Spanish men (M = 18.28), under 20 years old in Spain (M = 16.30), Mexican married couples (M = 18.29), Spanish students with married parents (M = 22.50), Spanish students not living with parents (M = 16.30), without religious beliefs in Spain (M = 16.92), Spanish homosexual students (M = 20.83), and Spanish students with social networks (M = 16.20).

Table 2 Test t by country in the different dimension

Dimension	Country	n	Mean	SD	t	df	p
Sexting	Mexico	394	12.89	5.83	− 7.386	779	.000
	Spain	387	16.17	6.55			
Depression	Mexico	394	6.03	5.31	− 3.409	779	.001
	Spain	387	7.42	6.08			
Anxiety	Mexico	394	6.14	4.79	.114	779	.909
	Spain	387	6.10	5.29			
Stress	Mexico	394	8.70	5.20	− 1.697	779	.090
	Spain	387	9.33	5.26			

Table 3 Descriptive statistics of the independent variables in sexting scale

	Mexico		Spain		p
	M	SD	M	SD	
Gender					
Male	13.97	6.33	18.28	7.14	.000
Female	11.98	5.22	15.40	6.16	
Age					
< 20	12.76	5.62	16.30	6.48	.000
21–35	13.17	6.55	16.20	6.58	
> 36	16.71	8.57	14.56	7.09	
Marital status					
Single	12.75	5.69	15.89	6.55	.000
Couple	16.63	7.44	16.89	6.68	
Married	18.29	8.95	12.91	4.18	
Divorced	9.50	1.91	12.60	1.14	
Parents marital status					
Couple	14.56	5.50	22.50	16.26	.038
Married	12.84	5.96	16.00	6.48	
Divorced	12.88	5.80	17.01	6.58	
One parent deceased	12.82	4.05	15.69	6.78	
Both parents deceased	16.00	–	13.80	4.86	
Siblings					
Yes	12.82	5.87	16.10	6.54	.761
No	13.77	5.43	16.88	6.71	
Position between siblings					
First	13.03	5.75	16.56	6.85	.579
Second	12.48	5.80	15.59	5.83	
Third	13.45	6.45	15.82	6.14	
Fourth	13.67	5.86	17.13	11.34	
Fifth	10.0	2.22	19.43	8.82	
Lives with parents					
Yes	12.47	5.48	16.04	6.66	.000
No	13.97	6.55	16.30	6.45	
Children					
Yes	14.65	7.80	12.64	2.46	.738
No	12.81	5.73	16.30	6.62	
Religious beliefs					
Yes	12.69	5.82	14.95	6.11	.000
No	13.61	5.85	16.92	6.71	
Sexual orientation					
Heterosexual	12.69	5.62	15.48	6.00	.000
Homosexual	17.71	8.93	20.83	10.13	
Bisexual	14.54	7.24	17.58	6.59	
Social networks use					
Yes	12.89	5.83	16.20	6.57	.009

Table 3 (continued)

	Mexico		Spain		p
	M	SD	M	SD	
No	–	–	14.17	4.99	
Dating apps					
Yes	17.48	7.10	21.86	8.17	.557
No	12.55	5.59	15.59	6.08	
Electronic device					
Computer	11.16	3.71	18.76	9.08	.300
Laptop computer	12.80	6.01	15.89	6.40	
Smartphone	12.96	5.75	16.12	6.46	
Tablet	16.00	9.11	17.20	3.49	

– No event; *p* calculated through MANCOVA test

Table 4 presents the correlation results, as well as the measures of central tendency and dispersion obtained in the analysis of the variables. The correlation of sexting was significant with the results of depression ($p = .012$) and stress ($p = .038$); but it was not significant with the results of anxiety ($p = .474$).

On the other hand, the multiple linear sexting regression model presented an adequate adjustment and was significant for Mexico ($R^2 = .107$; F-statistic $= 3.025$; $p < .001$), Spain ($R^2 = .145$; F-statistic $= 3.936$; $p < .001$) and Total ($R^2 = .172$; F-statistic $= 9.320$; $p < .001$) (Table 5). The significant independent variables for the Mexican model were: gender ($p = .002$), and use of dating applications ($p < .001$). For the Spain model: gender ($p = .001$), and use of dating applications ($p < .001$). Moreover, for the Total model they were country ($p < .001$), gender ($p < .001$), sexual orientation ($p = .020$) and use of dating applications ($p < .001$).

For the establishment of MG-SEM, the hypothesis of multivariate normality was fulfilled in all three models. For the Mexico model the Mardia coefficient obtained a value of 13.289, in the Spain model the value was 8.471 and

Table 4 Correlation between the variables and descriptive statistics

Variables	1. Sexting	2. Depression	3. Anxiety	4. Stress
1. Sexting	1			
2. Depression	.099*	1		
3. Anxiety	.029	.787***	1	
4. Stress	.084*	.797***	.894***	1
Average	14.52	6.72	6.12	9.01
Standard deviation	6.41	5.74	5.04	5.23
Skewness	1.21	.790	.818	.239
Kurtosis	1.10	− .293	− .004	− .692

$n = 781$, *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table 5 Sexting multiple linear regression analysis

Model	Independent variable	B	SE	T	β	p
Mexico	Gender	− 1.931	.609	− 3.170	− .165**	.002
	Age	.016	.768	.020	.001	.984
	Marital status	.933	.777	1.202	.067	.230
	Parents marital status	− .129	.512	− .251	− .013	.802
	Siblings	.967	1.127	.858	.044	.391
	Position between siblings	− .211	.320	− .658	− .034	.511
	Lives with parents	1.063	.674	1.577	.082	116
	Children	− 1.318	1.571	− .839	− .046	.402
	Religious beliefs	.108	.732	.147	.008	.883
	Sexual orientation	1.007	.588	1.714	.085	.087
	Dating apps	− 4.258	1.177	− 3.618	− .184***	.000
	Electronic device	.698	.473	1.478	.073	.140
	Depression	.026	.083	.314	.024	.754
	Anxiety	− .018	.103	− .174	− .015	.862
	Stress	.099	.092	1.080	.088	.281
Spain	Gender	− 2.502	.760	− 3.290	− .169***	.001
	Age	− .679	.662	− 1.025	− .058	.306
	Marital status	.887	.587	1.511	.084	.132
	Parents marital status	.118	.495	.239	.012	.811
	Siblings	.348	1.170	.297	.015	.766
	Position between siblings	.253	.381	.665	.034	.506
	Lives with parents	.165	.675	.245	.013	.807
	Children	3.762	1.982	1.898	.107	.058
	Religious beliefs	.960	.691	1.389	.071	.166
	Sexual orientation	.584	.441	1.324	.069	.186
	Social networks use	− 1.888	2.606	− .725	− .036	.469
	Dating apps	− 5.217	1.150	− 4.535	− .231***	.000
	Electronic device	− .055	.555	− .099	− .005	.922
	Depression	.037	.082	.444	.034	.657
	Anxiety	− .071	.105	− .680	− .058	.497
	Stress	.145	.107	1.347	.116	.179

Table 5 (continued)

Model	Independent variable	*B*	SE	*T*	*β*	*p*
Total	Country	2.739	.543	5.042	.214***	.000
	Gender	− 2 − 117	.472	− 4.484	− .159***	.000
	Age	− .316	.489	− .645	− .027	.519
	Marital status	.749	.454	1.651	.066	.099
	Parents marital status	− .085	.344	− .247	− .008	.805
	Siblings	.669	.808	.828	.029	.408
	Position between siblings	− .002	.244	− .009	.000	.993
	Lives with parents	.588	.471	1.249	.045	.212
	Children	.621	1.228	.506	.019	.613
	Religious beliefs	.565	.492	1.148	.043	.251
	Sexual orientation	.796	.342	2.328	.082*	.020
	Social networks use	− 1.851	2.456	− .754	− .025	.451
	Dating apps	− 4.813	.809	− 5.952	− .204***	.000
	Electronic device	.469	.356	1.318	.044	.188
	Depression	.034	.058	.597	.031	.551
	Anxiety	− .055	.073	− .755	− .043	.450
	Stress	1.26	.070	1.802	.103	.072

B Coefficient, *SE* Standard error, *T* Coefficient based on the T of Student, *β* standardized coefficient

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

in the Total model the value was 13.276. So all these values were lower than $[p \times (p + 2)]$, where p = the number of total variables (30) (Bollen and Long 1993).

The goodness-of-fit indexes of MG-SEM were normal and confirmed the adequacy of data (Ruiz et al. 2010). The following scores were obtained for the Mexico model: Chi square ($\chi^2 = 11.070$); degrees of freedom ($df = 6$); the ratio χ^2/df was 1.845; goodness-of-fit index (GFI = .996); root mean squared error of approximation (RMSEA = .033); normalised fit index (NFI = .994); comparative fit index (CFI = .997); adjusted goodness-of-fit index (AGFI = .979); standardized root mean square residual (SRMR = .0182). The following scores were obtained for the Spain model: Chi square ($\chi^2 = 8.310$); degrees of freedom ($df = 3$); the ratio χ^2/df was 2.77; goodness-of-fit index (GFI = .992); root mean squared error of approximation (RMSEA = .073); normalised fit index (NFI = .988); comparative fit index (CFI = .991); adjusted goodness-of-fit index (AGFI = .945); standardized root mean square residual (SRMR = .0442). And the following scores were obtained for the Total model: Chi square ($\chi^2 = 5.334$); degrees of freedom ($df = 3$); the ratio χ^2/df was 1.778; goodness-of-fit index (GFI = .995); root

mean squared error of approximation (RMSEA = .045); normalised fit index (NFI = .993); comparative fit index (CFI = .997); adjusted goodness-of-fit index (AGFI = .968); standardized root mean square residual (SRMR = .0306).

With respect to the estimates, the significant associations previously described in the linear regression model between the independent variables and the sexting were established (Table 6). The possible influence of sexting on the variables depression, anxiety and stress was also calculated, where the relationship of sexting with stress in the Spain model ($p = .030$) and sexing with depression ($p = .020$) and stress ($p = .001$) in the Total model was significant. In addition, the correlations generated between depression, anxiety and stress were significant in all three models ($p < .001$).

Table 6 Parameter estimates of final model

Model	Relation	Cov	SE	CR	p	SRW
Mexico	Gender → sexting	− 1.730	.575	− 3.011	.003	− .148
	Dating Apss → sexting	− 4.543	1.132	− 4.012	***	− .197
	Sexting → depression	.048	.046	1.043	.297	.053
	Sexting → anxiety	.042	.041	1.043	.297	.052
	Sexting → stress	.066	.044	1.498	.134	.075
	Depression ↔ anxiety	.303	.039	7.853	***	.800
	Depression ↔ stress	.353	.041	8.693	***	.776
	Anxiety ↔ stress	.309	.040	7.659	***	.897
Spain	Gender → sexting	− 2.190	.727	− 3.014	.003	− .148
	Dating Apss → sexting	− 5.649	1.108	− 5.098	***	− .251
	Sexting → depression	.086	.048	1.806	.071	.093
	Sexting → anxiety	.035	.041	.861	.389	.044
	Sexting → stress	.088	.040	2.169	.030	.110
	Depression ↔ anxiety	.334	.043	7.846	***	.783
	Depression ↔ stress	.449	.051	8.787	***	.820
	Anxiety ↔ stress	.332	.043	7.685	***	.892
Total	Country → sexting	3.267	.440	7.420	***	.255
	Gender → sexting	− 1.986	.453	− 4.387	***	− .149
	Sexual orientation → sexting	.989	.330	2.998	.003	.102
	Dating Apss → sexting	− 4.829	.793	− 6.087	***	− .205
	Sexting → depression	.076	.033	2.329	.020	.085
	Sexting → anxiety	.043	.028	1.546	.122	.055
	Sexting → stress	.094	.029	3.260	.001	.116
	Depression ↔ anxiety	.316	.029	11.028	***	.787
	Depression ↔ stress	.401	.032	12.370	***	.797
	Anxiety ↔ stress	.317	.029	10.790	***	.894

Cov Covariance, *SE* Standard error, *CR* Critical radio, *SRW* Standardized regression weights

*** $p < .001$
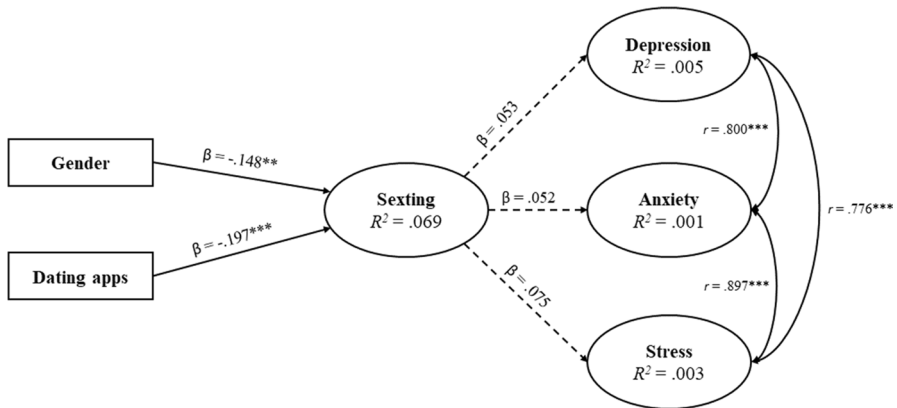
Fig. 1 Estimations of the structural equation model of Mexican sample. *Note* β=standardized direct effect; *r*=correlation coefficient; **p<.01; ***p<.001. Discontinuous arrow=not significant
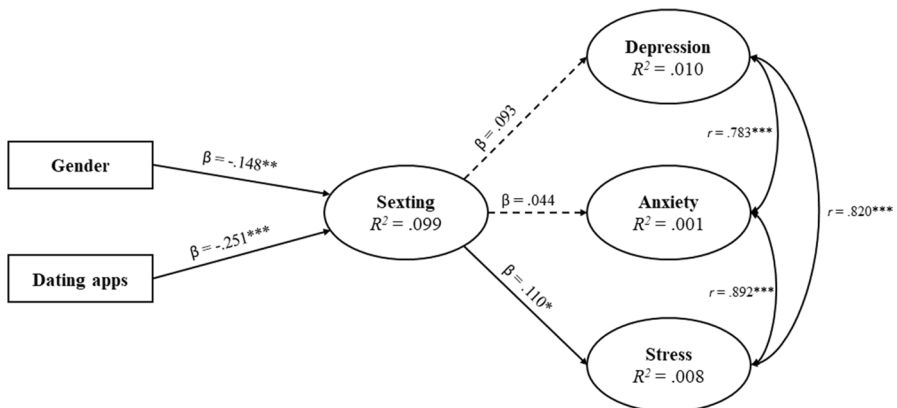
Fig. 2 Estimations of the structural equation model of Spanish sample. *Note* β=standardized direct effect; *r*=correlation coefficient; **p<.01; ***p<.001. Discontinuous arrow=not significant

The structural equation model estimates for the Mexico model reflected the significant value of the dependent variables gender and use of dating applications with the practice of sexting (Fig. 1). While sexting did not significantly value depression, anxiety and stress in Mexican college students. The coefficient of determination for sexting was 6.9% (R^2=.069), for depression it was .5% (R^2=.005), anxiety was .1% (R^2=.001) and stress was .3% (R^2=.003). In addition, significant positive correlations were established between the three variables.

The structural equation model estimates for the Spain model reflected the significant value of the dependent variables gender and use of dating applications with the practice of sexting (Fig. 2). While sexting only significantly value the stress of Spanish university students. The coefficient of determination for sexting was 9.9% (R^2=.099), for depression it was 1% (R^2=.010), anxiety was .1% (R^2=.001) and

stress was .8% ($R^2 = .008$). In addition, significant positive correlations were established between the three variables.

The structural equation model estimates for the Total model reflected the significant value of the dependent variables country, gender, sexual orientation and use of dating applications with the practice of sexting (Fig. 3). While sexting significantly value depression and stress in Spanish and Mexican university students as a whole. The coefficient of determination for sexting was 15% ($R^2 = .154$), for depression it was 2.5% ($R^2 = .025$), anxiety was 0% ($R^2 = .000$) and stress was .7% ($R^2 = .007$). In addition, significant and positive correlations were established between the three variables.

Discussion

The results on sexting indicated significant differences between the sample of Mexican and Spanish population, in the same way that more frequency of this practice was observed in Spanish students. Significant differences were also observed with respect to the depression scale. Regarding the socio-demographic data, similarities were found in both samples in the independent variables: having siblings, position between siblings, having children, using dating applications, electronic device. The highest frequency was obtained in homosexual people, with married parents and people who use mobile dating applications. In the remaining variables, significant differences were found between the two groups in relation to the practice of sexting.

The data also show a significant correlation between sexting and depression and sexting and stress. Multiple linear regression analysis showed that the possible variables predicting sexting in the total population were country, gender, sexual orientation and use of dating applications. In contrast, for the Mexican and Spanish populations separately, only the relation of gender and the use of dating applications were significant.
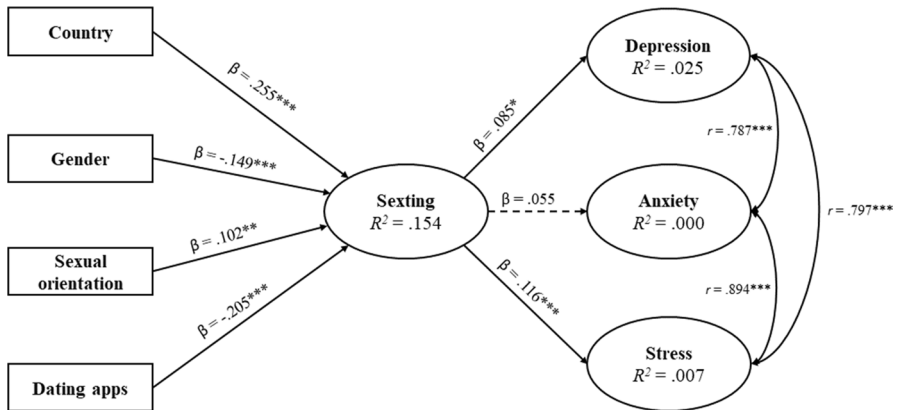
Fig. 3 Estimations of the structural equation model of Total sample. *Note* β = standardized direct effect; *r* = correlation coefficient; *p < .05; **p < .01; ***p < .001. Discontinuous arrow = not significant

Sociodemographic factors of sexual orientation show probability of affecting the practice of sexting in both samples as a whole. The results of this study proved significant differences in sexual orientation and increased frequency in people who identify as gay and use dating apps. These results contrast with the denial of sexual orientation as a determining factor (Gámez-Guadix and de Santisteban 2018), which could be explained by the freedom that non-heterosexual people find to relate through networks without fear of being judged (Gámez-Guadix et al. 2017), that is, homosexual people find in virtual interaction a space free of courtship; unlike heterosexual people, who are not judged. On the other hand, the greater frequency evidenced with people who use dating apps confirms the results found in the Albury and Byron study (2014), which is often influenced by whether or not they live with their parents.

Gender is a factor that can influence the practice of sexting in universities, which is related to contextual and cultural characteristics. The Mexican sample presents more frequency of the practice of sexting in the male gender than in the female gender. The results are the opposite of those reported in the studies by Madigan et al. (2018), Marengo et al. (2019) and Handschuh et al. (2019), who show that there are no gender differences behind the practice of sexting. They agree with what Arias-Cerón et al. (2018) report regarding the higher frequency in men. The differences found between both samples could explain the impact that socio-cultural issues have on students' behavior. This is because, culturally, men tend to have more freedom in terms of their sex lives.

Unlike other studies, we found large significant differences between the groups in the practice of sexting. So gender, age, marital status, parental status, living with parents, religious beliefs, sexual orientation and use of social networks showed significant differences between the two population samples. Furthermore, sexting practice was higher among young students, which contrasts with data obtained in previous works (Gámez-Guadix and de Santisteban 2018; Sesar et al. 2019). With respect to marital status, significant differences were found between them, with married status showing the highest degree of sexting. This was affirmed in studies that confirm the frequency of this activity in stable sentimental settings (Courtice and Shaughnessy 2017; Sesar et al. 2019). On the other hand, it is important to note that although sending sexually suggestive materials is a way to demonstrate desire between partners, there are risks due to the misuse of these materials (Kopecký 2014). These results indicate that the practice of sexting is not harmful in itself, but when sexting is with a person with whom there is no relationship based on respect and mutual trust.

The marital status of the parents represents a factor that could be related to the practice of sexting. In the Spanish sample, significant differences were evident in this respect, indicating that this practice is more frequent in people whose parents are married. No other studies addressing these factors have been found in the literature, however, Wong et al. (2019) state that living with both biological parents may predict less recurrence of sexting, which may also be explained by parental control and has been evidenced in the data obtained, where the highest averages are in students living outside the family home.

Regarding religious beliefs, differences were also found among the population, with Spaniards without religious beliefs obtaining the highest average. Thus, there was a certain relationship between being religious or not in the practice of sexting.

Depression and stress were directly related to the practice of sexting. In the global results, Mexican and Spanish sample, the depression and stress scale were significant with respect to the sexting scale. This result was consistent with the empirical evidence from several previous studies (Ahern and Mechling 2013; Dodaj et al. 2020; Gámez-Guadix and de Santisteban 2018; Gassó et al. 2020; Mori et al. 2019; Van Ouytsel et al. 2014). It is important to note that the presence of a psychological disorder is not usually represented as an indicator, but rather as a consequence of an individual's pressure to obtain sexual content, bringing feelings of guilt or shame (Ahern and Mechling 2013; Drouin et al. 2015; Temple et al. 2014). These data show the urgent responsibility of universities to promote orientation programs in this regard, in order to avoid situations that affect the psychological health, integral and sexual well-being of students. In contrast, anxiety was not affected as indicated by previous studies (Trub and Starks 2017). The data indicate that these mental disorders can be indicators of possible cases of blackmail, abuse, cyberbullying or pressure, therefore it is necessary to address it and talk openly about consequences for sharing intimate material without the consent of the person sending it; that is, to protect the victim rather than to punish him/her.

In sum, country, gender, sexual orientation, and use of dating applications can predict the practice of sexting in college students. Estimates from the structural equation model indicated the prediction of these independent variables in the practice of sexting. Other studies have indicated that gender may predict this practice, arguing that it is more frequent in women, and the relationship of such action in seeking approval from others (Alonso-Ruido et al. 2018; Courtice and Shaughnessy 2017; Klettke et al. 2014), contrary to this study where it was shown to be more frequent in men. On the side of sexual orientation, some studies suggest that there is no such prediction (Gámez-Guadix and de Santisteban 2018), however, in this research the opposite has been found. Regarding the use of citation application, similar results were obtained in other studies (Albury and Byron 2014). Again, these indicators may be useful for the design of programs to prevent psychological disorders derived from sexting malpractice, not in a criminalistic sense but in a preventive sense.

Conclusions

This study analyzed the frequency of sexting behavior in Mexican and Spanish university students, where it was found that there are significant differences between the samples and that it is more frequent in students from Spain. The sociodemographic factors that can influence this practice were also analysed, highlighting in both samples being gender and the use of citation applications. On the other hand, a positive correlation was found between sexting and depression and sexting and stress. In sum, the evidence found was a response to the objectives set out in the study about analyzing sexting behavior in Mexican and Spanish university students, and

determining the possible sociodemographic factors of influence in order to generate explanatory models.

For future research, it is suggested that the sample of participants be expanded and diversified with respect to the universities in the context of the study. Similarly, it is suggested that it be approached with other populations susceptible to this phenomenon, as well as to include other variables that allow for explaining and generating bases for the generation of orientation programs in order to avoid negative effects of this practice in educational contexts. Similarly, it is necessary to investigate the reasons why they decide to practice sexting, this in order to prove the effects of pressure or harassment that may exist. It is important that the results of this research be considered for studies that address the causes and effects of this practice in diverse populations, expanding the line of research. Furthermore, a limitation of the study was the measure obtained on some factors where small correlation coefficients were collected indicating a weak but significant association. These associations should therefore be taken with caution.

Finally, the phenomenon of sexting must be addressed as a current problem in young people who do it without knowing the consequences and risks involved, and in young people themselves who misuse the content received from another person, leading to cases that carry legal consequences and personal discomfort.

Compliance with Ethical Standards

Conflict of interest The authors declare that there is no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The research is in the process of being approved by the Research Ethics Committee of the University of Granada (Application Number 1718).

Informed Consent Informed consent was obtained from all individual participants included in the study.

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