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Sexting in adolescence: The use of technology and parental supervision

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Abstract Sexting is a risky behaviour that is becoming increasingly common among adolescents. There has been little research in Latin American countries. This study analyses sexting in relation to technology use, peer and family connectedness, and parental supervision in Ecuadorian adolescents, examining gender and age differences. A sample of 613 adolescents (12-18 years old) from Quito (Ecuador) completed a questionnaire about sexting, technology use, and parental supervision. The results show that the typical profile of a sexting practitioner is an adolescent who spends a lot of time using a mobile phone, mainly for peer engagement, and who also makes greater use of the internet and social networks. Parental control does not appear to be a key factor in relation to sexting. The typical profile did not differ across gender or stage of adolescence, although boys and older adolescents were more involved in sexting. Girls used Instagram and Snapchat more, and they also used their mobile phone more often for peer engagement. The use of ICTs was greater among late and middle adolescents, and parental supervision decreased as adolescents got older. Sexting is associated with a greater use of technology, mainly for peer engagement. Strict parental supervision does not mitigate adolescent sexting. Educational implications are discussed.

Sexting en la adolescencia: uso de la tecnología y supervisión parental

PALABRAS CLAVE
Redes sociales,
internet,
control parental,
teléfono móvil,
relaciones con
los iguales,
adolescentes

Resumen El *sexting* es una conducta de riesgo que se está incrementando en la adolescencia. La investigación en países latinoamericanos es escasa. Este estudio analiza el sexting relacionado con el uso de la tecnología, comunicación con iguales y familia, y supervisión parental, incluyendo el género y la edad en adolescentes ecuatorianos. Una muestra de 613 adolescentes (12-18 años) de Quito (Ecuador) cumplimentaron cuestionarios sobre *sexting*, uso de la tecnología y supervisión parental. El perfil del practicante de *sexting* es el adolescente que usa más el teléfono móvil, principalmente, para comunicarse con los iguales, y también internet y redes sociales. El control parental no se asocia a menor práctica del *sexting*. Este perfil no varía según el género o etapa de la adolescencia, aunque los chicos y adolescentes mayores muestran mayor implicación en *sexting*.

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Las chicas usan más Instagram y Snapchat y el teléfono móvil para relacionarse con los iguales. El uso de la tecnología es mayor en la adolescencia media y tardía y la supervisión parental disminuye a medida que incrementa la edad. El *sexting* está relacionado con mayor uso de la tecnología, principalmente, para relacionarse con los iguales, y la supervisión parental restrictiva no mitiga esta práctica. Se discuten las implicaciones educativas.

Today's adolescents have grown up with access to digital tools and regularly use information and communication technologies (ICTs) (Michaud & Free, 2017) to share information with family and friends (McLeod, 2014). Indeed, adolescents now connect to social media many times throughout the day, such that their identity and contexts of sociability are constructed through the use of technology (Ahn, 2011; Menjívar, 2010; Ringrose, Gill, Livingstone, & Harvey, 2012).

Data from various studies highlight the importance of ICTs for relationships in the present generation of adolescents (Malo-Cerrato, Martín-Perpiñá, & Viñas-Poch, 2018; Michaud & Free, 2017; Subrahmanyam & Greenfield, 2008). In the USA, 95% of adolescents between 13 and 17 years old access the internet using their own smartphone (Anderson & Jian, 2018). A survey conducted across 25 European countries found that 59% of children and adolescents aged from 9 to 16 use the internet and 77% of 13-16 year olds have a profile in at least one social network (Livingstone, Ólafsson, & Staksrud, 2013). In Ecuador, the National Institute of Statistics and Census (INEC) found that 85.2% of adolescents and young adults aged between 16 and 24 used the internet in 2017, and 69.3% of this group had a smartphone that enabled them access to the internet and social media (INEC, 2017). Across the population as a whole, internet use was the highest in this age group.

The most popular applications for communication through ICTs include instant messaging platforms such as WhatsApp, and social networks like Facebook, Instagram, Snapchat or Twitter. These applications allow adolescents to stay connected with friends and family and to share images and exchange ideas (Moreno & Kolb, 2012; Okeefee, Clarke-Pearson & Council on Communications and Media, 2011; Subrahmayam & Greenfield, 2008). In this regard, Campbell and Park (2014) highlighted the relevant role that ICTs play in the emancipation process by providing adolescents with autonomy and flexibility in their social interaction with peers. However, technology can also have important risks if misused or overused. Indeed, as social networks have become a new space for relationships, new problems have also emerged (Cerniglia et al., 2017; Gámez-Guadix, Orue, & Calvete, 2013; Reid & Weigle, 2014; Tur-Porcar, Doménech & Jiménez, 2019), with negative consequences for social behaviour. Recent studies have reported that adolescents are suffering various types of online abuse, control, or harassment in interpersonal relationships involving technology, notably cyberbullying, cyberstalking, grooming, and cyber dating abuse, all of which may have both health and legal implications (Dreßing, Bailer, Anders, Wagner, & Gallas, 2014; Gámez-Guadix, Borrajo, & Almendros, 2016; Gómez, Harris, Barreiro, Isorna, & Rial, 2017; Morelli, Bianchi, Chirumbolo, & Baiocco, 2018; Sadhir, Stockburge, & Omar 2016). Some of these types of abuse are also linked to offline violence and have been shown to have negative consequences for victims' mental health (Borrajo, Gámez-Guadix, & Calvete, 2015; Pereira & Matos, 2016; Zweig, Dank, Yahner, & Lachman, 2013).

Another phenomenon that has emerged with the use of technology for interpersonal relationships is sexting. Sexting refers to the exchange of sexually explicit messages, images or videos with others via the internet, smartphones or social networking sites (Bianchi, Morelli, Baiocco, & Chirumbolo, 2019; Klettke, Hallford, & Mellor, 2014), and it may be defined as passive or active. Active sexting refers to the creating, showing, sending, posting or forwarding of sexual content, whereas passive sexting involves receiving, asking for or being asked for sexually explicit material (Barrense-Dias, Berchotold, Surís, & Akre, 2017; Temple & Choi, 2014). Sexting may serve as a way of exploring sexuality and it is related to romantic interaction and flirting (Ringrose et al., 2012; Temple & Choi, 2014). Wolak and Finkelhor (2011) refer to this kind of sexting as 'experimental'. However, although sexting may be part of the natural and consensual dynamic of adolescent relationships, it may also involve abusive, violent or deviant intentions, in which case it becomes what Wolak and Finkelhor (2011) call an aggravated incident. Consequently, sexting is considered risky behaviour (Drouin, Ros, & Tobin, 2015; Kopecký, 2012), and importantly, it is becoming increasingly common among adolescents the world over (Bianchi, Morelli, Nappa, Baiocco, & Chirumbolo, 2018; Drouin, Coupe, & Temple, 2017).

Research has identified three distinct motivations among adolescents who engage in sexting (Bianchi et al., 2019): a sexual purpose (searching for a new sexual experience or maintaining a sexual relationship), body image reinforcement (looking for feedback about one's appearance in order to improve self-esteem), and instrumental/aggravated reasons (using sexting as an instrumental behaviour to perpetrate interpersonal violence). In this context, sexting has been linked to a high risk of dating violence, online harassment, cyberbullying, and grooming, (Bianchi et al., 2018; Bianchi et al., 2019; Choi, Van Ouytsel, & Temple, 2016; Drouin et al., 2017; Drouin et al., 2015; Rodríguez-Castro, Alonso-Ruido, Lameiras-Fernández & Faílde-Garrido, 2018), as well as to substance abuse and risky sexual behaviours (Cruz & Soriano, 2014; Livingstone & Görzig, 2014; Ybarra & Mitchell, 2014). Importantly, these sexting-related risks can lead to health and emotional problems such as anxiety and suicide risk (Dake, Price, Maziarz, & Ward, 2012; Reid & Weigle, 2014; Ringrose et al., 2012).

Studies in Europe and the USA report a prevalence of active sexting among adolescents ranging between 2.5% and 27.6% (Barrense-Dias et al., 2017), with a mean across studies of 10.2% for sending 'sexts' (Klettke et al., 2014). Research has also found that boys are more involved in active

sexting than girls (Baumgartner, Sumter, Peter, Valkenburg, & Livingstone, 2014; Chacón-López, Caurcel-Cara & Romero-Barriga, 2019; Morelli, Bianchi, Baiocco, Pezzuti, & Chirumbolo, 2016a, 2016b; Strassberg, Cann, & Velarde, 2017). Likewise, the prevalence of active sexting is higher for older adolescents (Gámez-Guadix, De Santisteban, & Resett, 2017; Lippman & Campbell, 2014; Ybarra & Mitchell, 2014) and for those who are in a relationship (Barrense-Dias et al., 2017; Klettke et al., 2014; Kopecký, 2015; Van Ouytsel, Van Gool, Walrave, Ponnet, & Peeters, 2016). In the Latin American context, West et al. (2014) found that 20% of Peruvian adolescents were involved in sexting, both passive and active. In Ecuador, Yépez-Tito, Ferragut, and Blanca (2018) found a prevalence of active sexting among adolescents of between 3.5% and 18.5%, depending on the specific action considered (respond, send or post) and the type of material (text, images). Consistent with the results obtained in Europe and the USA, both these studies reported a higher prevalence of sexting among boys (West et al., 2014; Yépez-Tito et al., 2018), teenagers in late adolescence, and adolescents in a romantic relationship (Yépez-Tito et al., 2018).

Research also supports a relationship between the use of social networking sites and sexting. A study of Hispanic adolescents in the USA by Romo et al. (2017) found that frequent social media use increased the odds of sexting, as well as of sexual activity. Other studies with young adults have found that Snapchat is the most common application for sexting (Utz, Muscanell, & Khalid, 2015; Vaterlaus, Barnett, Roche, & Young, 2016). The way in which adolescents communicate through ICTs is also relevant in the sexting context. For example, sexting has been linked to excessive texting (Campbell & Park, 2014; Rice et al., 2017) and has shown a positive association with peer connectedness and a negative association (although with marginal statistical significance) with family connectedness (Campbell & Park, 2014). Campbell and Park (2014) interpreted the latter results in terms of social emancipation in adolescence, that is to say, they considered sexting as an expression of emancipation which contributes to the development of social identity and sexuality. From this perspective, the role of family becomes attenuated as peer relationships become increasingly important, resulting in more frequent communication with peers than with family through ICTs.

Due to concerns about what adolescents share online, adults often seek to monitor and supervise their use of technology. A report by the Pew Research Centre in the USA on parental digital monitoring found that 61% of parents supervised the use of technology by checking visited websites, and 60% checked their children's social media profile (Anderson, 2016). However, the empirical evidence is inconclusive as regards to the impact that parental supervision has on the extent to which adolescents engage in sexting, so more research in this area is warranted. Some studies have found that parental supervision which includes control of mobile phone use is not effective for mitigating adolescent sexting, and that family support is not associated with the sending of sexts to strangers (Burén & Lunde, 2018; Campbell & Park, 2014). Other authors, however, have found that parental monitoring of social media, such as parental possession of passwords, decreases the risk of sexting (Romo et al., 2017), and it has also been suggested that other forms of supervision, like having clear rules about sending or receiving sexual messages, could decrease the probability of sexting (West et al., 2014). Recently, Bianchi et al. (2019) investigated the association between family functioning and sexting in girls and found that, in general, engaging in sexting was negatively associated with family communication.

Potential risks associated with the use of technology by adolescents, such as sexting, should be a public health priority given the possible negative consequences of this behaviour (Milton et al., 2019). However, most research on the use of technologies and social networks has been carried out with young adults (Rauzzino & Correa, 2017; Utz et al., 2015; Vaterlaus et al., 2016) rather than with adolescents, and few studies have analysed the role that parental supervision may have in relation to sexting behaviour (Campbell & Park, 2014, West et al., 2014). In addition, the majority of studies about sexting have been conducted in the USA and Europe (Baumgartner et al., 2014; Campbell & Park, 2014; Gámez-Guadix et al., 2017; Lippman & Campbell, 2014; Morelli et al., 2016a, 2016b; Strassberg et al., 2017; Ybarra & Mitchell, 2014), with scarce research to date in Latin American countries (West et al., 2014, Yépez-Tito et al., 2018). Results in the latter population might, however, be different to those from Europe and the USA, due to economic and sociocultural differences. For example, a UNICEF report (2016) into digital technology use worldwide found that adolescents from Latin America and Caribbean countries expressed the most concern about the danger of the internet: two-thirds believed that young people are in danger of being sexually abused or taken advantage of online, and 67% thought that friends participated in risky behaviour online, compared with a figure of 36% in the USA and UK.

In the specific case of Ecuador, very little is known about sexting in adolescence, the use of technology, and parental supervision. Research with Ecuadorian adolescents is therefore warranted in order to make comparisons with other countries and to establish a knowledge base for this population. Accordingly, the aim of the present study was to analyse sexting in this population in relation to ICT use, the use of social networking sites for peer and family communication, and parental supervision of mobile phone use, taking into account both gender and the stage of adolescence. Therefore, we sought, first, to determine the typical profile of adolescents who engage in sexting based on their ICT use. This involved examining whether the level of engagement in active sexting was associated with differences in access to technological resources, frequency of internet and mobile use, and the use of social networks such as Facebook, WhatsApp, Instagram, Snapchat, and Twitter, especially for messaging and for sharing photographs and video. In accordance with previous research (Campbell & Park, 2014; Rice et al., 2017; Romo et al., 2017), we expected to find that adolescents who engage more in sexting are also more frequent users of the internet, smartphones, and social networking sites. Second, we examined whether the level of engagement in active sexting was associated with differences in the use of a mobile phone for peer and family connectedness. Based on previous research (Campbell & Park, 2014), we expected to find that adolescents who are more involved in sexting also use their mobile phone more for peer engagement, but not for family engagement. Finally, and given the inconclusive results published to date,

we sought to add to knowledge about the role of parental supervision, exploring whether the degree of supervision is associated with differences in the level of engagement in active sexting. A strength of the present study is that this variable was assessed by considering both adolescent and parental reports of parental supervision. In addition, we explored the possible moderator effects of gender and stage of adolescence (early, middle, and late) on the observed relationships.

Method

Participants

Five schools in the metropolitan area of Quito (Ecuador) were invited to take part in the study and they all accepted. Although the schools were selected by convenience, participant classes within them were selected randomly. Participants included 613 students (270 females and 343 males) aged between 12 and 18 (M = 14.62, SD = 1.71) and enrolled in either compulsory secondary education or baccalaureate studies. The parents or legal guardians of these students also participated in the study. They were aged between 22 and 66 (M = 42.29; SD = 6.93). The inclusion criteria for adolescents were: (1) aged between 12 and 18, (2) native Spanish speakers, (3) not having a psychological problem recognized by the school, and (4) consent of their parents or legal guardians for participation. More information regarding participants is shown in Table 1.

Instruments

Active sexting. Sexting was assessed with six items referring to active sexting from the Sexting Behaviour Scale (SBS), developed by Chacón-López, Romero, Aragón, and Caurcel (2016) and validated in the Ecuadorian context by Yépez-Tito et al. (2018). Active sexting involves sending, responding to or posting messages with a sexual content, and participants were asked how often they did these things at present. Example items are: *How often have you sent images with a sexual content using your mobile phone*? *How often have you posted images with a sexual content on Facebook, Tuenti or other social networking sites*? Items are rated on a 5-point Likert scale from 0 to 4 (never; rarely; sometimes/several times a month; often/several times a week; frequently/daily), and a total score is obtained by summing the scores across all items. Higher scores indicate a higher level of involvement in active sexting. Cronbach's alpha for the present sample was .86.

Technological resources. The extent to which participants had access to technological resources was assessed through the following five questions, each of which had two response options (Yes/No, scored 1/0): *Do you have a mobile phone*? *Do you have a computer at home*? *Do you have a tablet*? *Do you have an internet connection at home*? *Can you access the internet with your mobile phone*? The number of available technological resources was then computed. Higher scores indicate that the respondent has more technological resources.

Frequency of internet and mobile phone use. The frequency of internet and mobile phone use was assessed through two items: *How often do you use the internet each day*? *How often do you use your mobile phone each day*? Each question had seven response options scored from 0 to 6 (never; 1-5 minutes; 6-15 minutes; 16-30 minutes; 36-59 minutes; 1-2 hours; more than 2 hours).

Mobile phone use for peer engagement. This was explored through six items related to the frequency of using a mobile phone for talking, sending/receiving text messages and sending/receiving photos or videos with friends and/or boy/girlfriends. Example items are: *How often do you message your friends or receive messages from them on your mobile phone*? *With your friends, how often do you send or receive photos or videos on your mobile phone*? The response options ranged from never (0) to several times a day (6). High scores indicate high use of a mobile phone for peer engagement. A total score ranging from 0 to 6 was obtained by calculating the mean score across all items. Cronbach's alpha for the present sample was .82.

Mobile phone use for family engagement. The same six items were used to explore use of a mobile phone for family engagement, but this time asking about parents or other relatives instead of friends and/or boy/girlfriends. Example items are: *How often do you message your parents or receive messages from them on your mobile phone*? *With your parents, how often do you send or receive photos or videos on your mobile phone*? The response options ranged from never (0) to several times a day (6), and as before, a total score ranging from 0 to 6 was obtained by calculating the mean score across all items. High scores indicate high use of a mobile phone for family engagement. Cronbach's alpha for the present sample was .89.

Frequency of social network use in general. The frequency of use of Facebook, WhatsApp, Instagram, Snapchat, and Twitter was assessed by asking participants how often they used each of these social networks. For example: *How often do you use Facebook*? There were seven response options ranging from never (0) to several times a day (6). High scores indicate high use of the respective social networks.

Frequency of social network use for specific purposes. This was explored through three items: *How often do you use the aforementioned applications for sending or receiving messages*? *How often do you use the aforementioned applications for sending or receiving photographs*? *How often do you use the aforementioned applications for sending or receiving videos*? The response options were the same as for the previous variable, ranging from never (0) to several times a day (6). A separate score was calculated for the frequency of social network use for messaging, for sharing photographs, and for sharing videos. High scores indicate high use of the respective networks for each specific purpose.

Parental supervision according to the adolescent. We used the battery of six items developed by Campbell and Park (2014) to assess the extent to which adolescents believed their mobile phone use was supervised, with two response options: No (0) and Yes (1). Adolescents were asked to consider the following list of different kinds of supervision: Limiting the times of day for using a mobile phone, using the mobile to monitor location, limiting the number of minutes for talking, limiting the number of messages sent, taking away the phone as punishment, and looking at the contents on the mobile phone. An example item is: *My parents limit the time of day when I can use the*

Table 1 Sociodemographic characteristics of adolescents and parents/legal guardians.

Participants	*N*	Percentage
Adolescents		
Gender		
Male	343	55.9
Female	270	44.1
Stage of adolescence		
Early (12-13 years old)	186	30.3
Middle (14-16 years old)	317	51.7
Late (17-18 years old)	110	17.9
Family structure		
Two-parent	477	77.8
Single-parent	129	21.1
Other	7	1.1
Having siblings		
No	53	8.6
Yes	560	91.4
Living with other family members		
No	434	70.8
Yes	179	29.2
Having a mobile phone		
No	80	13.1
Yes	533	86.9
Parent/legal guardian		
Gender		
Male	185	69.8
Female	428	30.2
Relationship with participant		
Mother	418	29.7
Father	182	68.2
Other relative	13	2.1
Marital status		
Married	464	75.7
Divorced or separated	128	20.9
Widowed	13	2.1
Single	8	1.3
Socioeconomic status[a]		
Low	83	13.5
Medium	249	40.6
High	281	45.8
Ethnicity		
Mestizo	555	90.5
White	24	3.9
Other	34	5.6

Note. [a] Parents/legal guardians completed the Survey of Socioeconomic Stratification (SSES) designed by Ecuador's National Institute of Statistics and Census.

mobile phone. Responses were summed to obtain a total score. High scores indicate that the adolescent perceives a high degree of control over his or her mobile phone use. Cronbach's alpha for the present sample was .66.

Parental supervision according to parents. Parents were asked to consider the same six kinds of supervision and to indicate whether or not they resorted to each one. Responses were summed to obtain a total score. High scores indicate that they believe they exert a high degree of control over their child's mobile phone use. Cronbach's alpha for the present sample was .66.

Procedure

All procedures were carried out in accordance with the Declaration of Helsinki. The Ministry of Education in Ecuador and the principal of each school supervised and approved the procedures and ethical aspects of this research. The Experimentation Ethics Committee of the University of Malaga also approved the study. Prior to any data collection, parents/legal guardians signed informed consent forms, which included a statement of the study's purpose and confidentiality procedures.

Parents completed a paper copy of the parental supervision questionnaire at home. Adolescents completed a paper copy of a questionnaire comprising all the above-mentioned measures during a single one-hour session held during normal class time at school, and in the presence of their teacher and a psychologist. Participation was voluntary and participants did not receive incentives.

Data analysis

As a preliminary analysis we computed descriptive statistics for each variable, as well as correlations between them, for the total sample.

In order to examine differences in the degree of involvement in sexting in relation to ICT use, the use of social networks for peer and family communication, and parental supervision of mobile phone use, we divided the sample into three groups based on the quartiles derived from scores on active sexting (mean and standard deviation in parentheses): no engagement in sexting (below first quartile, $N = 277$, $M = 0$, $SD = 0$), moderate engagement (between second and third quartile, $N = 218$, $M = 1.98$, $SD = 1.05$), and high engagement in sexting (above third quartile, $N = 118$,

M = 8.17, *SD* = 3.25). We also divided the sample into three age groups based on standard World Health Organization (2014) categories: early (12–13 years old), middle (14–16 years old), and late (17–18 years old) adolescence.

A chi-squared test was used to determine whether there were differences regarding gender and stage of adolescence in the sexting groups. We then performed a multivariate 3 x 2 x 3 analysis of variance (MANOVA) with sexting group (no, moderate, and high engagement), gender, and stage of adolescence (early, middle, and late) as grouping factors, and the following dependent variables, based on the aforementioned study objectives: (a) technological resources, frequency of internet and mobile phone use, frequency of social network use in general (Facebook, WhatsApp, Instagram, Snapchat, and Twitter), and frequency of social network use for sending/receiving messages, photographs, and videos; (b) frequency of mobile phone use for peer engagement and family engagement; and (c) parental supervision as reported by the adolescent and by parents. Scores on all variables were on the same scale with minimum and maximum values equal to 0 and 6, respectively.

In order to interpret the significant effects from the MANOVA, a series of univariate analyses of variance (ANOVAs) were performed for each dependent variable. Differences by gender were examined using *t* tests for independent samples. In these analyses we followed the guidelines proposed by Blanca, Alarcón, Arnau, Bono, and Bendayan (2018) regarding heterogeneity of variance and control of Type I error, taking into account the variance ratio, the pairing of variance with group size, and the coefficient of sample size variation. Eta squared and Cohen's *d* was used as an indicator of association and effect size. Finally, when the analysis involved more than two groups, and in order to determine which group(s) differed significantly from the other(s), we performed multiple comparisons with Bonferroni adjustment. All analyses were performed using IBM SPSS 23.

Results

Descriptive statistics and correlations among variables are shown in Table 2 and Table 3, respectively. Percentages of adolescents by sexting group (no, moderate, and high engagement), gender, and stage of adolescence are reported in Table 4. The chi-squared test was statistically significant for both gender, $x^2(2) = 35.68$, $p < 0.001$, and stage of adolescence, x^2 (4) = 37.63, $p < 0.001$. Only 9.6% of girls were classified as showing high engagement in sexting, compared with 26.8% of boys. The percentage of adolescents in the high-engagement group also increased as adolescents got older.

The results from the MANOVA for Sexting group x Gender x Stage of adolescence are shown in Table 5. Residuals from the models indicated that the underlying assumptions were fulfilled. The analysis showed statistical significance for the three main effects, as well as for the interaction Gender x Stage of adolescence. In order to interpret these significant effects, we performed ANOVAs according to sexting group and stage of adolescence, and *t* tests for independent samples according to gender. Regarding the Gender x Stage of

Table 2 Mean (*M*) and standard deviation (*SD*) for access to technological resources, frequency of internet, mobile phone, and social network use, and parental supervision of mobile phone use according to adolescents and parents.

Variables	*M*	*SD*
ICT use		
Technological resources	4.69	1.25
Frequency of internet use	4.95	1.33
Frequency of mobile use	4.60	1.69
Facebook	4.99	1.73
WhatsApp	3.67	2.50
Instagram	2.81	2.64
Snapchat	2.24	2.48
Twitter	0.75	1.56
SNW use for messaging	4.70	2.01
SNW use for photographs	3.54	2.28
SNW use for videos	2.79	2.26
Family and peer connectedness		
Mobile phone use for peer engagement	3.06	1.75
Mobile phone use for family engagement	2.63	1.76
Parental supervision of mobile phone use		
According to adolescents	3.10	1.67
According to parents	1.88	1.53

Note. For all variables, minimum and maximum values were 0 and 6, respectively. SNW: social network

Table 3 Pearson correlations among variables related to technological resources, frequency of internet, mobile phone, and social network use, and parental supervision of mobile phone use according to adolescents and parents.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Technological resources (1)														
Frequency of internet use (2)	0.28**													
Frequency of mobile phone use (3)	0.46**	0.50**												
Mobile phone use for peer engagement (4)	0.33**	0.31**	0.54**											
Mobile phone use for family engagement (5)	0.30**	0.04	0.28**	0.41**										
Facebook frequency (6)	0.17**	0.29**	0.35**	0.39**	0.14**									
WhatsApp frequency (7)	0.37**	0.24**	0.53**	0.49**	0.40**	0.27**								
Instagram frequency (8)	0.26**	0.23**	0.32**	0.43*	0.27**	0.32**	0.35**							
Snapchat frequency (9)	0.26**	0.20**	0.33**	0.46*	0.31**	0.27**	0.41**	0.57**						
Twitter frequency (10)	0.09*	0.09*	0.05	0.11**	0.15**	0.10**	0.07	0.23**	0.20**					
Social network use for messaging (11)	0.32*	0.35*	0.45**	0.48**	0.21**	0.35**	0.41**	0.34**	0.28**	0.10**				
Social network use for photos (12)	0.30**	0.30**	0.40	0.45*	0.24**	0.34**	0.40**	0.32**	0.31**	0.10**	0.47**			
Social network use for videos (13)	0.26**	0.25**	0.31**	0.37**	0.29**	0.26**	0.35**	0.25**	0.24**	0.14**	0.37**	0.74**		
Parental supervision of mobile phone use (adolescents) (14)	0.13**	-0.10**	0.05	0.12**	0.21**	0.03	0.03	0.07*	0.08*	0.05	0.01	-0.04	-00.2	
Parental supervision of mobile phone use (parents) (15)	0.06	0.06	0.05	0.05	0.05	0.01	0.04	0.02	0.02	-0.02	0.01	0.05	0.04	0.15**

Note. ** $p < 0.01$, * $p < 0.05$, $N = 613$.

Table 4 Percentage of adolescents by sexting group, gender, and stage of adolescence.

	No engagement	Moderate engagement	High engagement
Gender			
Female	55.9	34.4	9.6
Male	36.7	36.4	26.8
Stage of adolescence			
Early (11-13)	57.5	36.0	6.5
Middle (14-16)	42.6	35.0	22.4
Late (17-19)	31.8	36.4	31.8
Total	45.2	35.6	19.2

adolescence interaction, we compared the mean scores of girls and boys at each stage of adolescence for all significant variables, using the Bonferroni adjustment. According to Blanca et al. (2018), in an unbalanced design, ANOVA controls Type I error when the variance ratio is less than 2 and there is positive pairing between variance and group size. Only two variables, corresponding to sexting groups, had variance ratios higher than 2 (specifically, values of 2.26 and 2.78). Importantly, however, Blanca et al. (2018) also found that for a variance ratio of 3, ANOVA was robust with positive pairing and a coefficient of sample size variation less than 0.50. In our data for the sexting group, this

Table 5 Results from the multivariate analysis of variance: Sexting group (no, moderate, and high engagement) x Gender x Stage of adolescence (early, middle, and late): *F* statistics, degrees of freedom, p-value, and eta squared.

Effects	*F*	*d.f.*	*p*	η^2
Sexting group (SG)	2.16	30, 1164	< 0.001	0.05
Gender (G)	3.83	15, 581	< 0.001	0.09
Stage of adolescence stage (SA)	3.01	30, 1164	< 0.001	0.07
SG * G	0.77	30, 1164	0.81	0.02
SG * SA	1.05	60, 2236	0.37	0.03
G * SA	1.57	30, 1164	0.03	0.04
SG * G * SA	0.98	60, 2336	0.52	0.03

coefficient was equal to 0.39. Based on these results, we considered it appropriate to proceed with the interpretation of the results of the statistical analysis. Tables 6, 7 and 8 show, respectively, the results related to sexting groups, gender, and stage of adolescence, while Table 9 shows the statistically significant variables for the Gender x Stage of adolescence interaction. The absence of interaction between sexting group, age, and gender indicated that these variables did not moderate the differences observed between sexting groups. All values of eta-squared and Cohen's *d* for significant variables corresponded to low or moderate association or effect sizes.

Use of information and communication technologies

Statistically significant differences were observed for all variables, except frequency of Twitter use. Compared with non-practitioners of sexting, moderate and high practitioners reported more frequent use of the internet and their mobile phones in general, of Facebook and Instagram, and of social networks for messaging. High practitioners of sexting, compared with moderate and non-practitioners, reported more technological resources and a greater use of WhatsApp, and they also used Snapchat significantly more often than non-practitioners did. Finally, the use of social networks for sharing photos and videos increased in line with the level of engagement in sexting.

Regarding gender, there were statistically significant differences in the frequency of use of Instagram and Snapchat, with girls scoring higher than boys. In relation to the stage of adolescence, there were statistically significant differences for nine variables. Middle and late adolescents, compared with early adolescents, reported more frequent use of the internet, their mobile phone, Facebook, WhatsApp, and Instagram. Late adolescents, compared with early adolescents, were more frequent users of social networks for messaging and sharing videos. The frequency of social network use for sharing photographs increased in line with the stage of adolescence. However, the Gender x Stage of adolescence interaction and multiple comparisons via the Bonferroni adjustment showed that in late adolescence, boys were more frequent users of social networks for sharing photographs and videos.

Family and peer connectedness

The use of a mobile phone for peer engagement differed significantly according to the sexting group, with mobile use increasing in line with the level of engagement in sexting. There was no significant association between the sexting group and the use of mobile phones for family engagement.

Regarding gender and age, statistically significant differences were observed in relation to the use of a mobile phone for peer engagement. Girls, compared with boys, and middle and late adolescents, compared with early adolescents, reported using their mobile more frequently for peer engagement. The frequency of mobile phone use for family engagement did not differ according to gender or age.

Parental supervision of mobile phone use

There were no significant differences across the three sexting groups or regarding gender in relation to parental supervision of mobile phone use, whether it be according to adolescents or parents. However, late adolescents, compared with their middle and early peers, perceived less parental supervision, and parents reported decreasing supervision as the stage of adolescence increased.

Discussion

The aim of this study was to analyse the frequency of active sexting by Ecuadorian adolescents in relation to ICT use, the use of social networking sites for peer and family communication, and the role of parental supervision, while exploring differences by gender and the stage of adolescence (early, middle, and late). To this end we first examined whether the level of engagement in active sexting was associated with differences in access to technological resources, frequency of internet and mobile phone use, and the use of social networks such as Facebook, WhatsApp, Instagram, Snapchat, and Twitter, especially for messaging and for sharing photographs and videos. We then looked at whether the level of engagement in active sexting was associated with differences in the use of a mobile phone for peer and family connectedness. Finally, we sought to add to current knowledge regarding the role of parental supervision by exploring whether the degree of supervision

Table 6 Mean (*M*) and standard deviation (*SD*) for the dependent variables according to the three sexting groups, *F*-statistics from the ANOVA, and eta squared.

Variables	No engagement		Moderate engagement		High engagement			
	M (SD)		*M (SD)*		*M (SD)*		*F*	η^2
ICT use								
Technological resources [a]	4.56	(1.34)	4.66	(1.24)	5.05	(0.95)	6.52*	0.02
Frequency of internet use [b]	4.69	(1.51)	5.08	(1.12)	5.31	(1.06)	10.98**	0.04
Frequency of mobile phone use [b]	4.30	(1.85)	4.71	(1.60)	5.14	(1.23)	11.19**	0.04
Facebook [b]	4.52	(2.04)	5.29	(1.32)	5.53	(1.22)	20.46**	0.06
WhatsApp [a]	3.37	(2.55)	3.59	(2.49)	4.54	(2.20)	9.58**	0.03
Instagram [b]	2.33	(2.56)	3.14	(2.66)	3.30	(2.62)	8.48**	0.03
Snapchat [d]	1.91	(2.35)	2.34	(2.48)	2.82	(2.68)	5.98*	0.02
Twitter [e]	0.72	(1.57)	0.78	(1.52)	0.75	(1.60)	0.07	<0.01
SNW use for messaging [b]	4.39	(2.15)	4.83	(1.90)	5.18	(1.77)	7.18*	0.02
SNW use for photographs [c]	3.03	(2.24)	3.68	(2.27)	4.48	(2.05)	18.58**	0.06
SNW use for videos [c]	2.30	(2.14)	2.89	(2.27)	3.78	(2.20)	18.98**	0.06
Family and peer connectedness								
Mobile phone use for peer engagement [c]	2.60	(1.69)	3.24	(1.70)	3.80	(1.69)	22.77**	0.07
Mobile phone use for family engagement [e]	2.51	(1.75)	2.72	(1.83)	2.76	(1.66)	1.31	<0.01
Parental supervision of mobile phone use								
According to adolescents [e]	3.09	(1.66)	3.27	(1.69)	2.81	(1.63)	2.89	<0.01
According to parents [e]	1.84	(1.50)	2.02	(1.62)	1.73	(1.39)	1.64	<0.01

Note. ** $p < 0.01$, * $p < 0.05$, $N = 613$, n no engagement = 277, n moderate engagement = 218, n high engagement = 118. SNW: social network

[a] No engagement = moderate < high (1 vs. 3, 2 vs 3)

[b] No engagement < moderate = high (1 vs. 2, 1 vs. 3)

[c] No engagement < moderate < late (1 vs. 2, 1 vs. 3, and 2 vs. 3)

[d] No engagement < high (1 vs. 3)

[e] No engagement = moderate = high (no differences)

(as reported by both adolescents and their parents) was associated with differences in the level of engagement in active sexting.

Preliminary analyses showed that 35.6% and 19.2% of adolescents had engaged moderately or highly in sexting, respectively. In line with previous studies showing that boys are more involved in active sexting (Baumgartner et al., 2014; Morelli et al., 2016a, 2016b; Strassberg et al., 2017; West et al., 2014; Yépez-Tito et al., 2018), only 9.6% of girls reported high engagement in sexting, compared with 26.8% of boys. This may be related to differences in the way boys and girls express sexuality and to cultural stereotypes of masculinity and femininity (West et al., 2014; Yépez-Tito et al., 2018). Our analysis also showed that the percentage of adolescents in the high sexting group increased with age (from 6.5% in early adolescence to 31.8% in the late stage). This result is also consistent with previous research and it may reflect the greater involvement in romantic relationships and greater interest in sex in late adolescence (Barrense-Dias et al., 2017; Döring, 2014; Gámez-Guadix et al., 2017; Kopecký, 2015; Lippman & Campbell, 2014; Livingstone & Görzig, 2014; Yépez-Tito et al., 2018).

Use of information and communication technologies

Regarding differences in the frequency of active sexting with respect to ICT use, our results indicated that adolescents in the high engagement group also have more technological resources and use WhatsApp more frequently than do their peers in both the moderate and no-engagement groups; they are also more frequent users of Snapchat compared with adolescents who do not engage in sexting. We also found that, in comparison with adolescents in the no-engagement group, those who do report active sexting (both moderate and high) are more frequent users of the internet, their mobile phone, Facebook, Instagram, and social networking sites for messaging. The frequency of use of social networking sites for sharing photographs and videos also increased in line with the level of involvement in

Table 7 Mean (*M*) and standard deviation (*SD*) for the dependent variables according to gender, *t*-statistics, and Cohen's *d*.

Variables	Female		Male			
	M (SD)		*M (SD)*		*t*	*d*
ICT use						
Technological resources	4.67	(1.25)	4.71	(1.25)	-0.44	0.03
Frequency of internet use	4.91	(1.40)	4.98	(1.26)	-0.57	0.05
Frequency of mobile phone use	4.59	(1.81)	4.62	(1.59)	-0.24	0.02
Facebook	4.86	(1.90)	5.08	(1.57)	-1.58	0.12
WhatsApp	3.81	(2.53)	3.56	(2.47)	1.25	0.10
Instagram	3.48	(2.64)	2.28	(2.51)	5.73**	0.46
Snapchat	2.91	(2.56)	1.71	(2.28)	6.11**	0.47
Twitter	0.66	(1.53)	0.82	(1.58)	-1.27	0.10
SNW use for messaging	4.82	(1.99)	4.60	(2.03)	1.37	0.11
SNW use for photographs	3.40	(2.32)	3.65	(2.25)	-1.38	0.11
SNW use for videos	2.51	(2.19)	3.01	(2.29)	-2.73*	0.22
Family and peer connectedness						
Mobile phone use for peer engagement	3.28	(1.78)	2.89	(1.71)	2.75**	0.22
Mobile phone use for family engagement	2.71	(1.77)	2.57	(1.76)	0.97	0.08
Parental supervision of mobile phone use						
According to adolescents	3.25	(1.73)	2.98	(1.61)	1.93	0.16
According to parents	1.97	(1.55)	1.81	(1.51)	1.31	0.10

Note. ** $p < .01$, * $p < .05$, $N = 613$, n females = 270, n males = 343. SNW: social network.

sexting. Overall, heavy practitioners of sexting tend to have more technological resources, which one would expect given that this also implies more opportunities for communication and interaction. Moreover, and also as expected, the typical profile of a sexting practitioner was an adolescent who makes more frequent use of the internet, a mobile phone, and social networking sites, and who specifically uses them more often for messaging and for sharing photographs and videos. These results expand on knowledge about the relationship between the use of ICT and sexting among ecuadorian adolescents and they are consistent with previous research showing that frequent social media use increases the likelihood of involvement in sexting (Romo et al., 2017), a behaviour that is also associated with excessive texting (Campbell & Park, 2014; Rice et al., 2017).

The differences in ICT use across the three sexting groups were not moderated by gender or the stage of adolescence. However, the main effects of these variables and the interaction between the two were significant. Our analysis indicated that girls used Instagram and Snapchat more often than boys did, which is consistent with previous studies showing that girls spent more time than boys on social media (Twenge & Martin, 2020). Regarding age, late and middle adolescents made greater use of the internet, mobile phones, Facebook, WhatsApp, and Instagram, and they used these social networks more for sharing photographs, in comparison with their peers in the early adolescence group. Compared with the latter group, late adolescents also used social networks more for messaging and for sharing videos, and boys at this stage were more frequent users than girls of social networks for sharing photographs and videos. The fact that it is older adolescents who spend more time on the internet and using social networks is consistent with the fact that the internet plays an important role in adolescent development, contributing to identity formation and promoting personal autonomy (Borca, Bina, Keller, Gilbert, & Begotti, 2015).

Family and peer connectedness

Regarding differences in the frequency of active sexting in relation to the use of a mobile phone for peer and family connectedness, our results showed, as expected, that the more adolescents are involved in sexting, the more they use their mobile phone for peer engagement. However, there were no differences across the three sexting groups in relation to the use of a mobile phone for family engagement. These results are consistent with the findings of Campbell and Park (2014) in a sample of US adolescents aged 12-17 years old, and as proposed by these authors, they may be interpreted in terms of social emancipation. From this perspective, sexting is considered to be an expression of emancipation which contributes to the development of social

Table 8 Mean (*M*) and standard deviation (*SD*) for the dependent variables according to stage of adolescence, *F*-statistics from the ANOVA, and eta squared.

Variables	Early (11-13)		Middle (14-16)		Late (17-19)			
	M (SD)		*M (SD)*		*M (SD)*		*F*	η^2
ICT use								
Technological resources [a]	4.53	(1.39)	4.82	(1.20)	4.60	(1.11)	3.43*	0.01
Frequency of internet use [c]	4.61	(1.45)	5.07	(1.28)	5.19	(1.12)	9.48**	0.03
Frequency of mobile phone use [c]	4.00	(1.84)	4.80	(1.56)	5.05	(1.50)	18.99**	0.06
Facebook [c]	4.67	(1.92)	5.07	(1.70)	5.29	(1.33)	5.21**	0.02
WhatsApp [c]	2.73	(2.51)	3.97	(2.43)	4.42	(2.24)	21.84**	0.07
Instagram [c]	2.33	(2.63)	2.94	(2.63)	3.22	(2.58)	4.79**	0.02
Snapchat [g]	1.94	(2.34)	2.35	(2.53)	2.45	(2.55)	2.08	<0.01
Twitter [g]	0.75	(1.60)	0.75	(1.55)	0.73	(1.54)	0.01	<0.01
SNW use for messaging [b]	4.34	(2.09)	4.77	(2.04)	5.10	(1.70)	5.41**	0.02
SNW use for photographs [e]	2.97	(2.33)	3.62	(2.26)	4.28	(2.01)	12.16**	0.04
SNW use for videos [b]	2.49	(2.32)	2.83	(2.24)	3.20	(2.17)	3.54*	0.01
Family and peer connectedness								
Mobile phone use for peer engagement [c]	2.38	(1.62)	3.29	(1.71)	3.54	(1.76)	22.21**	0.07
Mobile phone use for family engagement [g]	2.51	(1.91)	2.66	(1.67)	2.76	(1.77)	0.74	<0.01
Parental supervision of mobile phone use								
According to adolescents [d]	3.36	(1.72)	3.12	(1.60)	2.62	(1.70)	6.97**	0.02
According to parents [f]	2.21	(1.69)	1.86	(1.49)	1.38	(1.20)	10.50**	0.03

Note. ** $p < 0.01$, * $p < 0.05$, $N = 613$, *n* early = 186, *n* middle = 317, *n* late = 110. SNW: social network.
[a] Early < middle (1 vs. 2)
[b] Early < late (1 vs. 3)
[c] Early < middle = late (1 vs. 2, 1 vs. 3)
[d] Early = middle < late (1 vs. 3, 2 vs 3)
[e] Early < middle < late (1 vs. 2, 1 vs. 3, and 2 vs. 3)
[f] Early > middle > late (1 vs. 2, 1 vs. 3, and 2 vs. 3)
[g] Early = middle = late (no differences)

identity and sexuality, increasing the importance of peer relationships and attenuating the role of family.

Differences in connectedness to peers and family across sexting groups were not moderated by gender or the stage of adolescence. However, we found that girls used their mobile phones more for peer engagement than boys did, which is in line with previous studies showing that girls use ICTs mainly for interpersonal communication (Lenhart et al., 2015; Volman, Van-Eck, Heemskerk, & Kuiper, 2005). Social relationships with peers is of greater importance for girls (Flook, 2011; LaFontana & Cillessen, 2010), and ICTs allow them to interact with larger numbers of people and to remain in frequent contact with friends (Livingstone, 2008; Reich, Subrahmanyam, & Espinoza, 2012). Research has also found that girls tend to engage in more social conversation and self-disclosure, are more sensitive to the status of their peer relationships and friendships, and are more likely to seek support, express their emotions, and receive higher levels of many emotional provisions in their friendships (Rose & Rudolph, 2006).

The frequency of mobile phone use for peer engagement was also greater in late and middle adolescence than in the early stage. However, no gender or age differences were found regarding mobile phone use for family engagement. These results support the view that peer groups become increasingly important as children reach adolescence, and they are likewise consistent with the aforementioned emancipation hypothesis (Campbell & Park, 2014). The need for independence and autonomy increases in line with the stage of adolescence, leading adolescents to be more connected to peers and to make more frequent use of ICTs for the purposes of communication and for forming close relationships with one another (Borca et al., 2015). It should also be noted that the use of ICTs can be a source of conflict with parents, and hence adolescents may decrease their online relationship with parents as they get older (Borca et al., 2015).

Table 9 Mean (*M*) and standard deviation (*SD*) for the significant dependent variables regarding the Gender x Stage of adolescence interaction, *F*-statistics from the ANOVA, and eta squared.

		Female		Male			
Frequency of social network (SNW) use	**Stage of adolescence**	***M (SD)***		***M (SD)***		***F***	***η2***
SNW for photographs	Early (11-13) [b]	3.12	(2.36)	2.85	(2,30)	5.37**	0.02
	Middle (14-16) [b]	3.49	(2.31)	3.72	(2.22)		
	Late (17-19) [a]	3.65	(2.24)	4.64	(1.79)		
SNW for videos	Early (11-13) [b]	2.55	(2.28)	2.44	(2.37)	8.52**	0.03
	Middle (14-16) [b]	2.53	(2.21)	3.09	(2.22)		
	Late (17-19) [a]	2.40	(1.91)	3.66	(2.19)		

Note. ** $p < 0.01$, $N = 613$.
[a] Differences by gender, female < male.
[b] No differences by gender.

Parental supervision of mobile phone use

With respect to the relationship between sexting and parental supervision of mobile phone use, we found that parental supervision, both that perceived by adolescents and that reported by the parents themselves, was not associated with differences in the level of engagement in sexting. This suggests that parental supervision, as assessed here, may not have a major influence on sexting behaviour in this population. The supervision rules considered in this study were related to restrictions and limitations of mobile phone use (time for using it, talking, number of messages), monitoring of location and content, and withdrawal of the mobile phone as punishment. These results are consistent with some previous research which found that explicit restriction, including control of mobile phones, is not an effective strategy for mitigating adolescent sexting (Campbell & Park, 2014), indicating that adolescents exercise their autonomy in peer communication regardless of parental control. Accordingly, our results suggest that when it comes to educating adolescents about the safe use of the internet and social networks, the imposition of sanctions or rigid rules is unlikely to be effective. Rather, and as argued by other authors, flexible rules, good relationships between adolescents and parents, and adequate family communication focused on sexuality and family competence may be better at discouraging adolescents from sexting and the misuse or overuse of technology, thus reducing their exposure to online risk behaviours (Baumgartner, Sumter, Peter & Valkenburg, 2012; Bianchi et al., 2019; Padilla-Walker & Coyne, 2011; Tomić, Burić & Štulhofer, 2017; Trumello, Babore, Candelori, Morelli & Bianchi, 2018; Tur-Porcar, Doménech & Jiménez, 2019), Xiuqin et al., 2010; West et al., 2014).

Our analysis also showed that the relationship between sexting and parental supervision was not moderated by either gender or the stage of adolescence. However, we did find that late adolescents, compared with their early peers, perceived less parental supervision, and parents reported decreasing supervision as the stage of adolescence increased. These results suggest that parents use more control strategies during the 11-13-year age range, probably because they feel that their children are not yet able to regulate their own behaviour and to make their own decisions regarding social media use (Padilla-Walker, 2006).

Conclusions and Implications

The results of this study indicate that the typical profile of an adolescent who engages in sexting is one who makes greater use of their mobile phone, mainly for peer engagement, as well as of the internet and social networks such as Facebook or Instagram, which are used more frequently for messaging and for sharing photos and videos. Parental control, at least in the form assessed here, does not appear to be a key factor in relation to the practice of sexting. The typical profile did not differ across gender or stage of adolescence, although boys and older adolescents were more involved in sexting. Girls, however, were more likely than boys to use their mobile phone for peer engagement, and they were also more frequent users of some social networks such as Instagram and Snapchat. Regarding age, late and middle adolescents made greater use of the internet and their mobile phone, mainly for peer engagement, and they were also more frequent users of Facebook, WhatsApp, and Instagram, especially for sharing photographs. A greater use of social networks for messaging and for sharing videos was also observed among late adolescents, particularly boys. Late adolescents perceived less parental control over their mobile phone use, which was consistent with parental reports of decreasing supervision as the stage of adolescence increased.

These results extend knowledge about the profile of sexting practitioners in relation to ICT use, peer and family connectedness, and parental supervision. The fact that the study was conducted in Ecuador is also important, as research into sexting by adolescents is scarce in the Latin American context. Overall, the results for this population are consistent with those obtained in Europe and the USA, suggesting that sexting among adolescents follows a similar pattern across different cultures, although this would need to be confirmed with intercultural studies.

The results have certain educational implications. Importantly, around half the adolescents had experienced the exchange of sexually explicit material through electronic means, an experience that increases with age and which is related to a greater use of technology for peer engagement. However, direct parental control, such as monitoring or taking away a mobile device, does not appear to be a useful strategy for preventing sexting. The amount of time that adolescents spend using ICTs, during which they are exposed to all social media inputs, is also an aspect that needs to be considered. It is also important to recognize that sexual experimentation in adolescence now takes place online, and the associated risks need to be addressed both at school and within the family (Kopecký, 2016; Rice et al., 2017; Ringrose et al., 2012). During the early stage of adolescence, parents should focus more on helping their children to make a healthy and safe use of the internet and social networks, rather than impose restrictive rules. This means that parents themselves must have sufficient awareness of the digital world in order to offer appropriate guidance to their children (Boyd, 2014; Kopecký, 2016; Okeeffe et al., 2011; Ringrose et al., 2012; Romo et al., 2017). Schools and educators, for their part, should implement school-based programs about the appropriate use of social networks, including strategies for preventing the risks associated with ICTs, and these initiatives should be targeted at both adolescents and parents. Sabbah-Mani (2015) suggests that such programs could be incorporated into an established sex education curriculum in order to educate and inform adolescents about the legal and non-legal consequences of sexting, as well as about ways of practicing safe-sexting. However, as Döring (2014) recommends, these programs need to be designed in realistic terms and reflect what is normative as opposed to risky and deviant in adolescent sexualities.

Finally, this study has certain limitations that need to be acknowledged. First, the adolescents were all from the city of Quito and it would therefore be interesting in future studies to recruit samples from other geographical areas of Ecuador. Secondly, the cross-sectional nature of the study means that we cannot infer causal relationships between sexting and the use of technology. It should also be noted that sexting was examined here as a normative behaviour among adolescents, as part of the natural dynamic of their social relationships, and hence the risk and consequences of this behaviour were not addressed. Further studies are therefore necessary to better understand the potential benefits of sexting for romantic relationships, as well as its associated risks. In this respect, it would be interesting to investigate the displacement versus the stimulation hypothesis regarding the effect of online communication (Valkenburg & Peter, 2007). On the one hand, it is possible that adolescents who engage in sexting are, due to the fact that they are more connected and make greater use of social media, more at risk of developing other problems related to the misuse of technology; for example, problematic mobile phone use or internet addiction. They are also more likely to be exposed to negative social behaviours and different forms of technology-mediated violence. Alternatively, the greater connectivity and opportunities for communication afforded by social media may have a positive effect in terms of the time spent with friends, potentially enhancing the quality of adolescent relationships. Further research is needed to determine how this greater connectivity affects relationships between adolescents and their parents, and also, as Bianchi et al. (2019) point out, to examine the role of family functioning and communication in relation to sexting by both girls and boys.

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Declaration of interest statement

The authors declare no potential conflict of interest.

References

Anderson, M. (2016). Parents, teens and digital monitoring. *Pew Research Centre, online*. Retrieved from https://pewrsr.ch/1OAZ9zT

Anderson, M., & Jiang, J. (2018). Teens, social media & technology 2018. *Pew Research Centre, online*. Retrieved from https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/

Ahn, J. (2011). The effect of social network sites on adolescents' social and academic development: Current theories and controversies. *Journal of the Association for Information Science and Technology, 62,* 1435-1445. https://doi.org/10.1002/asi.21540

Barrense-Dias, Y., Berchotold, A., Surís, J., & Akre, C. (2017). Sexting and the definition issue. *Journal of Adolescent Health, 61,* 544-554. https://doi.org/10.1016/j.jadohealth.2017.05.009

Baumgartner, S., Sumter, S., Peter, J., & Valkenburg, P. (2012). Identifying teens at risk: Developmental pathways of online and offline sexual risk behaviour. *Pediatrics, 130,* 1489-1496. https://doi.org/10.1542/peds.2012-0842

Baumgartner, S., Sumter, S., Peter, J., Valkenburg, P., & Livingstone, S. (2014). Does country context matter? Investigating the predictors of teen sexting across Europe. *Computers in Human Behaviour, 34,* 157-164. https://doi.org/10.1016/j.chb.2014.01.041

Bianchi, D., Morelli, M., Baiocco, R., Cattelino, E., Laghi, F., & Chirumbolo, A. (2019). Family functioning patterns predict teenage girls' sexting. *International Journal of Behavioural Development, 43,* 507-514. https://doi.org/10.1177/0165025419873037

Bianchi, D., Morelli, M., Baiocco, R., & Chirumbolo, A. (2019). Individual differences and developmental trends in sexting motivations. *Current Psychology*. https://doi.org/10.1007/s12144-019-00398-4

Bianchi, D., Morelli, M., Nappa, M.R., Baiocco, R., & Chirumbolo, A. (2018). A bad romance: Sexting motivations and teen dating violence. *Journal of Interpersonal Violence, 33,* 1-21. https://doi.org/10.1177/0886260518817037

Blanca, M., Alarcón, R., Arnau, J., Bono, R., & Bendayan, R. (2018). Effect of variance ratio on ANOVA robustness: Might 1.5 be the limit? *Behaviour Research Methods, 50,* 937-962. https://doi.org/10.3758/s13428-017-0918-2

Borca, G., Bina, M., Keller, P.S., Gilbert, L.R., & Begotti, T. (2015). Internet use and developmental tasks: Adolescents' point of view. *Computers in Human Behaviour, 52*, 49-58. https://doi.org/10.1016/j.chb.2015.05.029

Borrajo, E., Gámez-Guadix, M., & Calvete, E. (2015). Cyber dating abuse: Prevalence, context, and relationship with offline dating aggression. *Psychological Reports, 116*, 565-585. https://doi.org/10.2466/21.16.PR0.116k22w4

Boyd, D. (2014). *It's Complicated: The Social Lives of Networked Teens*. New Haven, CT: Yale University Press.

Burén, J., & Lunde, C. (2018). Sexting among adolescents: A nuanced and gendered online challenge for young people. *Computers in Human Behaviour*. https://doi.org/10.1016/j.chb.2018.02.003

Campbell, S., & Park, Y. (2014). Predictors of mobile sexting among teens: Toward a new explanatory framework. *Mobile Media & Communication,* 2, 20-39. https://doi.org/10.1177/2050157913502645

Cerniglia, L., Zoratto, F., Cimino, S., Laviola, G., Ammaniti, M., & Adriani, W. (2017). Internet addiction in adolescence: Neurobiological, psychosocial and clinical issues. *Neuroscience and Biobehavioral Reviews, 76*, 174-184. https://doi.org/10.1016/j.neubiorev.2016.12.024

Chacón-López, H., Romero, J., Aragón, Y., & Caurcel, M. (2016). Construcción y validación de la escala de conductas sobre sexting (ECS). *Revista Española de Orientación y Psicopedagogía, 27,* 99-115. https://doi.org/10.5944/reop.vol.27.num.2.2016.17116

Chacón-López, H., Caurcel-Cara, M. J., & Romero-Barriga, J. F. (2019). Sexting en universitarios: relación con edad, sexo y autoestima. *Suma Psicológica*, *26*(1), 1-8. https://doi.org/10.14349/sumapsi.2019.v26.n1.1

Choi, H., Van Ouytsel, J., & Temple, J.R. (2016). Association between, sexting and -sexual coercion among female adolescents. *Journal of Adolescence, 53,* 164-168. https://doi.org/10.1016/j.adolescence.2016.10.005

Cruz, L., & Soriano, E. (2014). Psychological aspects, attitudes and behaviour related to the practice of sexting: A systematic review of the existent literature. *Procedia - Social and Behavioural Sciences*, *132*, 114-120. https://doi.org/10.1016/j.sbspro.2014.04.286

Dake, J., Price, J., Maziarz, L., & Ward, B. (2012). Prevalence and correlates of sexting behaviour in adolescents. *American Journal of Sexuality Education, 7,* 1–15. https://doi.org/10.1080/15546128.2012.650959

Dreßing, H., Bailer, J., Anders, A., Wagner, H., & Gallas, C. (2014). Cyberstalking in a large sample of social network users: Prevalence, characteristics, and impact upon victims. *Cyberpsychology, Behaviour, and Social Networking, 17*, 61-67. https://doi.org/10.1089/cyber.2012.0231

Drouin, M., Coupe, M., & Temple, J.R. (2017). Is sexting good for your relationship? It depends…. *Computers in Human Behaviour, 75*, 749-756. https://doi.org/10.1016/j.chb.2017.06.018

Drouin, M., Ross, J., & Tobin, E. (2015). Sexting: A new, digital vehicle for intimate partner aggression? *Computers in Human Behaviour, 50,* 197-204. https://doi.org/10.1016/j.chb.2015.04.001

Döring, N. (2014). Consensual sexting among adolescents: Risk prevention through abstinence education or safer sexting? *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 8*, Article 9. https://doi.org/10.5817/CP2014-1-9

Flook, L. (2011). Gender differences in adolescents' daily interpersonal events and well-being. *Child Development, 82,* 454–461. https://doi.org/10.1111/j.1467-8624.2010.01521.x

Gámez-Guadix, M., Borrajo, E., & Almendros, C. (2016). Risky online behaviours among adolescents: Longitudinal relations among problematic Internet use, cyberbullying perpetration, and meeting strangers online. *Journal of Behavioural Addictions, 5,* 100–107. https://doi.org/10.1556/2006.5.2016.013

Gámez-Guadix, M., De Santisteban, P., & Resett, S. (2017). Sexting among Spanish adolescents: Prevalence and personality profiles. *Psicothema, 29,* 29-34. https://doi.org/10.7334/psicothema2016.222

Gámez-Guadix, M., Orue, I., & Calvete, E. (2013). Evaluation of the cognitive-behavioural model of generalized and problematic Internet use in Spanish adolescents. *Psicothema, 25*, 299-306. https://doi.org/10.7334/psicothema2012.274

Gómez, P., Harris, S., Barreiro, C., Isorna, M., & Rial, A. (2017). Profiles of Internet use and parental involvement, and rates of online risks and problematic Internet use among Spanish adolescents. *Computers in Human Behaviour, 75*, 826-833. https://doi.org/10.1016/j.chb.2017.06.027

Instituto Nacional de Estadísticas y Censos (INEC) (2017). *Encuesta de tecnologías de la información y comunicaciones (TIC´s).* Retrieved from https://www.ecuadorencifras.gob.ec/tecnologias-de-la-informacion-y-comunicacion-tic-2017/

Klettke, B., Hallford, D., & Mellor, D. (2014). Sexting prevalence and correlates: A systematic literature review. *Clinical Psychology Review, 34*, 44-53. https://doi.org/10.1016/j.cpr.2013.10.007

Kopecký, K. (2012). Sexting among Czech preadolescents and adolescents. *The New Educational Review, 28,* 39-48. Retrieved from https://bit.ly/2AgiQOW

Kopecký, K. (2015). Sexting among Slovak pubescents and adolescent Children. *Procedia-Social and Behavioural Sciences*, *203*, 244-250. https://doi.org/10.1016/j.sbspro.2015.08.289

Kopecký, K. (2016). Czech children and Facebook – A quantitative survey. *Telematics and Informatics, 33*, 950–958. https://doi.org/10.1016/j.tele.2016.02.008

LaFontana, K. M., & Cillessen, A. H. N. (2010). Developmental changes in the priority of perceived status in childhood and adolescence. *Social Development, 19,* 130–147. https://doi.org/10.1111/j.1467-9507.2008.00522.x

Lenhart, A., Duggan, M., Perrin, A., Stepler, R., Rainie, L., & Parker, K. (2015). Teens, social media and technology overview, 2015. Smartphones facilitate shift in communication landscape for teens. *Pew Research Centre*. Retrieved from https://pewrsr.ch/1aoDmdM

Lippman, J. R., & Campbell, S. W. (2014). Damned if you do, damned if you don´t…if you are a girl: Relational and normative contexts of adolescent sexting in the United States. *Journal of Children and Media, 8*, 71-386. https://doi.org/10.1080/17482798.2014.923009

Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society, 10,* 393–411. https://doi.org/10.1177/1461444808089415

Livingstone, S., & Görzig, A. (2014). When adolescents receive sexual messages on the internet: Explaining experiences of risk and harm. *Computers in Human Behaviour, 33,* 8-15. https://doi.org/10.1016/j.chb.2013.12.021

Livingstone, S., Ólafsson, K., & Staksrud, E. (2013). Risky social networking practices among ''underage'' users: Lessons for evidence-based policy. *Journal of Computer-Mediated Communication, 18,* 303-320. https://doi.org/10.1111/jcc4.12012

Malo-Cerrato, S., Martín-Perpiñá, M., & Viñas-Poch, F. (2018). Excessive use of social networks: Psychosocial profile of Spanish adolescents. *Comunicar, 26*. https://doi.org/10.3916/C56-2018-10

McLeod, R. (2014). SSAT presidential address 2014: Here comes generation Y! *Journal of Gastrointestinal Surgery, 19*, 1-5. https://doi.org/10.1007/s11605-014-2703-1

Menjívar, M. (2010). El sexting y l@s nativ@s neo-tecnológic@s: Apuntes para una contextualización al inicio del Siglo XXI. *Actualidades Investigativas en Educación, 10,* 1-23. https://doi.org/10.15517/aie.v10i2.10117

Michaud, P., & Free, C. (2017). Alice in wonderland: Adolescents and digital technologies. In A. Cherry, V. Baltag & M. Dillon (Eds.), *International Handbook on Adolescent Health and Development* (pp. 397-409). Cham: Springer.

Milton, A.C., Gill, B.A., Davenport, T.A., Dowling, M., Burns, J.M., & Hickie, I.B. (2019). Sexting, web-based risks, and safety in two representative national samples of young Australians: Prevalence, perspectives, and predictors. *JMIR Mental Health 6*, e13338. https://doi.org/10.2196/13338

Morelli, M., Bianchi, D., Baiocco, R., Pezzuti, L., & Chirumbolo, A. (2016a). Sexting behaviours and cyber pornography addiction among adolescents: The moderating role of alcohol consumption. *Sexuality Research and Social Policy, 14*, 113-121. https://doi.org/10.1007/s13178-016-0234-0

Morelli, M., Bianchi, D., Baiocco, R., Pezzuti, L., & Chirumbolo, A. (2016b). Sexting, psychological distress and dating violence among adolescents and young adults. *Psicothema 28*, 137-142. https://doi.org/10.7334/psicothema2015.193

Morelli, M., Bianchi, D., Chirumbolo, A. & Baiocco, R. (2018). The cyber dating violence inventory. Validation of a new scale for online perpetration and victimization among dating partners. *European Journal of Developmental Psychology, 15*(4), 464-471, https://doi.org/10.1080/17405629.2017.1305885

Moreno, M., & Kolb, J. (2012). Social networking sites and adolescent health. *Pediatric Clinics of North America, 59*, 601-612. https://doi.org/10.1016/j.pcl.2012.03.023

Okeefee, G., Clarke-Pearson, K., & Council on Communications and Media. (2011). Clinical report: The impact of social media on children, adolescents, and families. *American Academy of Pediatrics, 127*, 800-804. https://doi.org/10.1542/peds.2011-0054

Padilla-Walker, L. M. (2006). "Peers I can monitor, it's media that really worries me!" Parental cognitions as predictors of proactive parental strategy choice. *Journal of Adolescent Research, 21*, 56–82.

Padilla-Walker, L.M., & Coyne, S.M. (2011). "Turn that thing off!" Parent and adolescent predictors of proactive media monitoring. *Journal of Adolescence, 34,* 705-715. https://doi.org/10.1016/j.adolescence.2010.09.002

Pereira, F., & Matos, M. (2016). Cyber-stalking victimization: What predicts fear among Portuguese adolescents? *European Journal on Criminal Policy and Research, 22*, 253-270. https://doi.org/10.1007/s10610-015-9285-7

Rauzzino, A., & Correa, J.C. (2017). Millennials sex differences on Snapchat perceived privacy. *Suma Psicologica, 24*(2), 129-134. https://doi.org/10.1016/j.sumpsi.2017.08.002

Reich, S. M., Subrahmanyam, K., & Espinoza, G. (2012). Friending, IMing, and hanging out face-to-face: Overlap in adolescents' online and offline social networks. *Developmental Psychology, 48*, 356–368. https://doi.org/10.1037/a0026980

Reid, D., & Weigle, P. (2014). Social media use among adolescents: Benefits and risks. *Adolescent Psychiatry, 4,* 73-80. https://doi.org/10.2174/2210676604021407091158 10

Rice, E., Craddock, J., Hemler, M., Rusow, J., Plant, A., Montoya, J., & Kordic, T. (2017). Associations between sexting behaviours and sexual behaviours among mobile phone-owning teens in Los Angeles. *Child Development, 89*, 110-117. https://doi.org/10.1111/cdev.12837

Ringrose, J., Gill, R., Livingstone, S., & Harvey, L. (2012). A qualitative study of children, young people and 'sexting': A report prepared for the NSPCC. *National Society for the Prevention of Cruelty to Children, London, UK*. Retrieved from https://bit.ly/2NQ1PNj

Rodríguez-Castro, Y., Alonso-Ruido, P., Lameiras-Fernández, M., & Faílde-Garrido, J. M. (2018). Del sexting al cibercontrol en las relaciones de pareja de adolescentes españoles: análisis de sus argumentos. *Revista Latinoamericana de Psicología, 50(3),* 170-178. https://doi.org/10.14349/rlp.2018.v50.n3.4

Romo, D., Garnett, C., Younger, A., Stockwell, M., Soren, K., Catallozzi, M., & Neu, N. (2017). Social media use and its association with sexual risk and parental monitoring among a primarily Hispanic adolescent population. *Journal of Pediatric and Adolescent Gynecology, 30,* 466-473. https://doi.org/10.1016/j.jpag.2017.02.004

Rose, A.J., & Rudolph, K.D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioural development of girls and boys. *Psychological Bulletin, 132*, 98–131. https://doi.org/10.1037/0033-2909.132.1.98

Sabbah-Mani, J. (2015). Sexting education: An educational approach to solving the media fuelled sexting dilemma. *Southern California Interdisciplinary Law Journal, 24*, 529-560.

Sadhir, M., Stockburger, S., & Omar, H. (2016). Challenges of internet and social media use in adolescents. *Dynamics of Human Health, 3,* 1-6.

Strassberg, D., Cann, D., & Velarde, V. (2017). Sexting by high school students. *Archives of Sexual Behaviour, 46*, 1667-1672. https://doi.org/10.1007/s10508-016-0926-9

Subrahmanyam, K., & Greenfield, P.M. (2008). Communicating online: Adolescent relationships and the media. *The Future of Children: Children and Media Technology, 18*, 119–146.

Temple, J., & Choi, H. (2014). Longitudinal association between teen sexting and sexual behaviour. *Pediatrics, 134,* 1-6. https://doi.org/10.1542/peds.2014-1974

Tomić, I., Burić, J., & Štulhofer, A. (2017). Associations between Croatian Adolescents' use of sexually explicit material and sexual behaviour: Does parental monitoring play a role? *Archives of Sexual Behaviour, 47*, 1-13. https://doi.org/10.1007/s10508-017-1097-z

Trumello, C., Babore, A., Candelori, C., Morelli, M., & Bianchi, D. (2018). Relationship with parents, emotion regulation, and callous-unemotional traits in adolescents. *Internet Addiction. BioMed Research International, 2018*, 7914261. https://doi.org/10.1155/2018/7914261

Tur-Porcar, A. M., Doménech, A., & Jiménez, J. (2019). Eficacia académica percibida, crianza, uso de internet y comportamiento en la adolescencia. *Revista Latinoamericana de Psicología, 51*(1), 38-47. https://doi.org/10.14349/rlp.2019.v51.n1.5

Twenge, J. M., & Martin, G. N. (2020). Gender differences in associations between digital media use and psychological well-being: Evidence from three large datasets. *Journal of Adolescence, 79,* 91-102. https://doi.org/10.1016/j.adolescence.2019.12.018

UNICEF (2016). *Perils and possibilities: Growing up online.* Retrieved from https://www.unicef.org/endviolence/endviolenceonline/files/UNICEF_Growing-up-online.pdf

Utz, S., Muscanell, N., & Khalid, C. (2015). Snapchat elicits more jealousy than Facebook: A comparison of Snapchat and Facebook use. *Cyberpsychology, Behaviour and Social Networking, 18,* 141-146. https://doi.org/10.1089/cyber.2014.0479

Vaterlaus, J., Barnett, K., Roche, C., & Young, J. (2016). "Snapchat is more personal": An exploratory study on Snapchat behaviours and young adult interpersonal relationships. *Computers in Human Behaviour, 62,* 594-601. https://doi.org/10.1016/j.chb.2016.04.029

Van Ouytsel, J., Van Gool, E., Walrave, E., Ponnet, K., & Peeters, E. (2016). Sexting: Adolescents' perceptions of the applications used for, motives for, and consequences of sexting. *Journal of Youth Studies, 20,* 3-25. https://doi.org/10.1080/13676261.2016.1241865

Volman, M., Van-Eck, E., Heemskerk, I., & Kuiper, E. (2005). New technologies, new differences. Gender and ethnic differences in pupils' use of ICT in primary and secondary education. *Computers & Education, 45*, 35-55. https://doi.org/10.1016/j.compedu.2004.03.001

West, J., Lister, C., Hall, P., Crookston, B., Snow, P., Zvietcovich, M., & West, R. (2014). Sexting among Peruvian adolescents. *BMC Public Health, 14*, 1-7. https://doi.org/10.1186/1471-2458-14-811

Valkenburg, P.M., & Peter, J. (2007). Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication, 12*, 1169–1182. https://doi.org/10.1111/j.1083-6101.2007.00368.x

Wolak, J., & Finkelhor, D. (2011). *Sexting: A typology.* Durham, NH: Crimes against Children Research Centre.

World Health Organization. (2014). *Health for the world's adolescents: A second chance in the second decade.* Retrieved from http://apps.who.int/adolescent/second-decade/

Xiuqin, H., Huimin, Z., Mengchen, L., Jinan, W., Ying, Z., & Ran, T. (2010). Mental health, personality, and parental rearing styles of adolescents with Internet addiction disorder. *Cyberpsychology, Behaviour, and Social Networking, 13*, 401-406. https://doi.org/10.1089/cyber.2009.0222

Ybarra, M., & Mitchell, K. (2014). "Sexting" and its relation to sexual activity and sexual risk behaviour in a national survey of adolescents. *Journal of Adolescence Health, 55,* 757-764. https://doi.org/10.1016/j.jadohealth.2014.07.012

Yépez-Tito, P., Ferragut, M., & Blanca, M.J. (2018). Prevalence and profile of sexting among adolescents in Ecuador. *Journal of Youth Studies,* 1-15. https://doi.org/10.1080/13676261.2018.1515475

Zweig, J. M., Dank, M., Yahner, J., & Lachman, P. (2013). The rate of cyber dating abuse among teens and how it relates to other forms of teen dating violence. *Journal of Youth and Adolescence, 42*, 1063-10.