

## Attitudes toward Sexting, Peer Pressure and Sexting among Adolescents

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### Abstract

**Objective** – This study examines the correlation between demographic characteristics (age and gender), attitudes toward sexting, and peer pressure and sexting behavior among adolescents. **Materials and Methods** – The current study was conducted among 359 adolescents ages 15-17 in Bosnia and Herzegovina, with data collected again one year after baseline. Participants completed questionnaires on demographic data, sexting behavior, attitudes toward sexting, and peer pressure. **Results** – Descriptive analyses showed that although adolescents have negative attitudes toward sexting, they do participate in sexting, reporting more receiving (62.95 % –64.06 %) than sending (30.91 % – 32.31 %) and posting (8.91 % – 8.63 %) sexts. Regression analysis revealed that age, gender, attitudes toward sexting and the influence of peer pressure in the fields of risky behavior and parental relationships are significant predictors of various types of sexting. Attitudes toward sexting and peer pressure to engage in risky behavior were also a predictor of sexting behavior one year later. **Conclusion** – The findings highlight the importance of addressing attitudes toward sexting and peer pressure in future preventive interventions related to sexting.

**Key Words:** Sexting; Attitudes Toward Sexting ■ Peer Pressure ■ Adolescents ■ Two-Wave Study.

## Introduction

In the current decade, sexting has gained momentum, and interest in using technology as a medium for communication among youth has increased. The term “sexting”, the combination of “sex” and “texting” was adopted as a new word in the New Oxford Dictionary’s Word of the Year 2009 in field of the technology (1). In general, it is defined as sending, receiving, or forwarding sexually explicit messages, or nude, partially nude, or sexually suggestive digital images of one’s self or others via a cell phone, e-mail, Internet, or Social Networking Service (SNS) (2). However, the specific definitions and conceptualization of sexting used in studies differ widely. Barrense-Dias et al. (3), in a literature review of eighteen studies published between 2012 and 2015, found that the definition of sexting

varies in terms of actions (sending, receiving, and forwarding), media types (text, images, and videos), sexual characteristics and transmission modes. Recently, Beckmeyer et al. (4) even stated that there are differences among researchers in the time range of sexting behaviour (e.g. focusing on the last six months or lifetime sexting behaviour), and assessment of multiple aspects of sexting (e.g. content of sexts, and having sent or received sexts). For this study, a broad definition of sexting is used that encompasses sending, receiving and posting sexts, for the sake of brevity, and because it is commonly understood by most researchers in this field.

Regardless of the specific definition of sexting used, it has become a very widespread and prominent issue for researchers. In a systematic review of the prevalence of sexting by Cooper et al. (5), conducted within a 5-year framework (2009-2014)

it was found that the prevalence of sexting ranges from 7% to 27%. A recent meta-analysis (6) of 39 studies, published in the period from 2008 to 2016, revealed that sexting prevalence varies from 12% to 27.4%. Previous studies have consistently shown that the prevalence of sexting increases as young people age (7, 8). Trends of a higher prevalence of sexting by age are usually explained by the increase in sexual interest and exploration of sexuality with age (9). However, research on the role of gender in sexting has yielded mixed results. Some studies have found no gender differences in sexting (10-12); others report that girls participate more in sexting than boys (13, 14); and some studies reveal that boys are more likely to engage in sexting (15, 16). Del Rey et al. (17) linked these differences to differences in the type of sexting being analysed, as well as differences in the motivation for sexting. The authors pointed out that boys forward and request sexts more often, while girls are asked to sext. In addition, for boys sexting ensures a higher status and for girls produces a feeling of shame, which implicates a double sexual standard.

One of the factors that has received significant attention and is essential to predicting sexting, is the attitude toward sexting. Studies have clearly shown that adolescents are more likely to engage in sexting behaviour if their attitudes toward that behaviour are positive (18-20). Young people who engage in sexting view sexting positively, for instance, as a way to initiate or maintain their intimate relationship, with an intent to explore and express themselves, or as a way to have fun or gain popularity among peers (5, 12, 21-24). There are at least two main theoretical mechanisms that can explain relationship between sexting and attitudes. First, this relationship is in accordance with Ajzen's (25) well-confirmed theory which postulated that people who evaluate a behaviour as a positive are more likely to engage in that behaviour. A second explanation is that by the mechanisms of social learning, usually through their peers, young people may develop positive beliefs about sexting and experience such behaviour (1, 26).

Some studies have indicated that sexting behaviour is driven by peer pressure and peers' attitudes toward sexting (12, 20, 23, 24, 27). A review by Sesar et al. (9) suggests that no other form of potentially risky behaviour in youth exerts so much pressure from peers as sexting. Hence, Dodaj et al. (28) suggested, those prone to one form of risky behaviour due to peer pressure will engage in other forms of risky behaviours as well. According to coercion theory (29, 30) the tendency to take risk, and anti-social behaviour, emerges from homes where a negative interaction between parents and adolescents reinforces their difficult behaviour and increases the likelihood of being influenced by peers in a deviant manner.

A major limitation of the studies discussed above is the use of a cross sectional approach. There is a major need for additional research examining both attitudes and peer influence, as well as demographic factors in predicting sexting, as relatively little is known about how these factors associated with sexting vary over time. The scarce evidence has focused only on the relationship between sexting and the consequences of sexting, such as psychological adjustment/health (28, 31), sexual risk behaviour (32, 33) or (cyber) bullying (34). To our knowledge, however, there have been no studies which have examined the demographic, attitudes toward sexting and peers pressure as together predictors of sexting. An individual's attitude toward sexting is one of the most important predictors of involvement in sexting behaviour (35). Pressure to participate in sexting can occasionally be subtly conveyed since it was once thought of as an extension of adolescent relationships (36).

For this reason, the aim of this research was to examine the relationship between demographic variables, changes in attitudes toward sexting, peer pressure and sexting. It has been postulated that demographic variables (age and gender), attitudes towards sexting and peer pressure predict sexting behaviour. More specifically, we hypothesized that demographic characteristics, attitudes towards sexting and peer pressure can predict changes in sexting behaviour over a one-year period.

## Methods

### Subjects

The current study began collecting data in 2022 and was conducted in two waves (Time 1 – T1; Time 2 – T2), one year apart. The initial sample was composed of 416 adolescents aged between 15 and 17 years. The participants were students from 41 randomly selected classes in 7 secondary schools, in a small region of Bosnia and Herzegovina. The high schools were selected using the non-probability convenience sampling method based on their accessibility and interest in participating in the study.

High school students with missing data for any of the measures, or those who did not complete the questionnaires in the T2 assessment were excluded from the analysis. Attrition analysis indicated no mean differences in demographic data between participants who responded both times and participants who dropped out from the study at T2. The resulting sample of data consisted of a total of 359 high school students (216 girls and 143 boys;  $M_{\text{age}}=16.324$ ;  $SD_{\text{age}}=0.636$  at the time of recruitment). Girls accounted for 60% ( $N=216$ ;  $M_{\text{age}}=16.330$ ;  $SD_{\text{age}}=0.654$ ) and males 40% ( $N=143$ ;  $M_{\text{age}}=16.314$ ;  $SD_{\text{age}}=0.610$ ) of the sample. Of these participants, 54% ( $N=195$ ) were enrolled from an academic high school program, while 46% ( $N=164$ ) were enrolled from a vocational high school programme.<sup>1</sup> Using G\*power 3.1 software to calculate the sample size (37), it was determined that the minimum sample size for a statistical analysis with an expected effect size of 0.02, a desired statistical power of 80% and a probability level of 0.05 is approximately 395.

## Measures

### Demographic Characteristics.

A short questionnaire to collect demographic data was developed. It included questions regarding age, gender, the school year attended and the type of school.

<sup>1</sup> In Bosnia and Herzegovina children either go to a *gimnazija* (with an academic curriculum leading to university education) or a vocational high school where they learn a profession or trade.

### Sexting Behavior.

To assess the exchange of sexually explicit content using electronic media, a Sexting Behavior Questionnaire was used (38). This instrument consists of 29 items that assess receiving (e.g. “How often have you received sexually suggestive or provocative text messages?”), sending (e.g., “How often have you sent sexually suggestive or provocative photos/videos by sms/mms/Whatsapp/Snapchat?”), and posting (e.g., “How often have you publicly posted sexually suggestive or provocative photos or videos on Facebook, Twitter, or MySpace?”) provocative or suggestive text messages, photos and videos. Participants responded on a five-point Likert scale ranging from 1 (never) to 5 (frequently or daily). To measure the frequency of sexting, the participants’ responses to items on the receiving, sending and posting subscales were dichotomized (“never” = non-sexters, all other responses = sexters). This measure also consisted of eight additional items to gather more detailed information about sexting. One item referred to the number of people with whom the subjects exchanged sexually suggestive or provocative content (e.g., nobody; only one person; two people; 3/5 people; more than 5 people). Additionally, two multiple choice items indicated the identity of the persons to whom the subjects sent, and from whom the subjects received sexually suggestive or provocative contents (e.g. nobody, partner, ex-partner, friends, strangers, someone you like, someone you are cheating your partner with). Finally, the last five items assessed the frequency of sexting during substance use (e.g. use of alcohol, marijuana, other drugs), and under pressure from a partner or friend, with a response format ranging from 1 (never) to 5 (always). The final scale reached a Cronbach alpha of 0.93. The receiving sub-scale exhibited an alpha of 0.86, the sending sub-scale 0.85, and the posting subscale 0.92 (38). For the current study, we used the subscales of sending, receiving, sending and posting. In our study, the reliability of the subscales of the questionnaire is acceptable, as for sending ( $\alpha_{\text{Time1}}=0.942$ ), receiving ( $\alpha_{\text{Time1}}=0.901$ ) and posting ( $\alpha_{\text{Time1}}=0.894$ ).

### ***Sexting Attitudes***

Attitudes toward sexting were measured using the *Attitudes Toward Sexting* instrument developed by Hudson et al. (1). The instrument is composed of 19 items examining attitudes toward sexting (e.g., “How much do you agree or disagree that each of the following [adjectives] describes the behaviour of sexting?”), attitudes about sexting consequences (e.g., “Sending personal sexy pictures/videos can have serious negative consequences.”), and opinions about those who engage in sexting behaviours (e.g., “Sending personal sexy pictures/videos is no big deal.”). Items were scored on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. Scores on these items were averaged and constituted a scale of sexting attitudes. Higher scores indicated that participants had more positive attitudes toward sexting. The Cronbach’s alpha was found to be  $\alpha_{\text{Time1}} = 0.805$  for this scale.

### ***Peer Pressure***

To assess the direction and intensity of pressure that adolescents perceive from friends we used the Scale of Susceptibility to Peer Pressure (39). It includes 25 items divided into five subscales: peer relations (e.g., “I would hang out with peers I don’t like if it would affect my popularity in the group.”), physical appearance (e.g., “I would change my hairstyle at my friends’ insistence.”), relations with parents (e.g., “I would rather make important decisions in accordance with expectations of society than of my parents.”), risk behaviour (e.g., “I would have sex if my friends suggested it.”) and behaviour in school (e.g., “Although I do not want to do so, I would skip class because others in my class do so.”). Participants responded on a scale of 1 to 5, where 1 corresponds to “not true” and 5 to “very true”. Higher scores indicate higher susceptibility to peer pressure. The five subscales showed good reliability — peer relations:  $\alpha_{\text{Time1}} = 0.648$ ; physical appearance:  $\alpha_{\text{Time1}} = 0.601$ ; relations with parents:  $\alpha_{\text{Time1}} = 0.733$ ; risk behaviour:  $\alpha_{\text{Time1}} = 0.675$ ; and behaviour at school:  $\alpha_{\text{Time1}} = 0.600$ .

### ***Ethics Statement***

Permission to conduct the study was obtained from the Ethics Committee of the Department of Psychology in Mostar, and the Review Board of the Ministry of Science, Education, and Sports in Bosnia and Herzegovina. The study was voluntary, and prior to the beginning of the study written informed consent was obtained from school directors, the parents or legal guardians of the adolescents, as well as the adolescent participants. The data was collected in schools during regular classes using a paper-and-pencil questionnaire. At the beginning of the administration of the questionnaire, the participants were provided with information about the study and were told they could withdraw from the study at any time. Participants were told in advance that participation was anonymous, and that the data obtained would be processed and displayed only at the group level. Then, the participants were asked to give their written consent, and create a personal code for matching the data collected at two time points. The questionnaires were then distributed and completed, which took approximately 15 to 20 minutes. During this time only one researcher was present in the classroom with the participants, in case there were any ambiguities or difficulties. After the participants had completed the questionnaires, they placed them in a cardboard box. One year later, the same method and questionnaires used at the baseline were used again.

### ***Statistical Analyses***

Before performing the main analysis, we analysed the normal distribution for all variables of interest using the values for asymmetry and kurtosis. The values for asymmetry and kurtosis were less than 2 and less than 7, respectively (40), which is considered an acceptable indication of a normal distribution. We also examined multicollinearity for each of the predictor variables in the regression model. The variance inflation factor (VIF) was used to examine the presence of multicollinearity. It was found that there was no multicollinearity as the mean



values of the VIF were below 10 (41). Descriptive data analysis was carried out to provide the basic sample characteristics and the frequency of participants involved in sexting. After that, we ran a Chi-square test to examine possible differences in sexting attitudes between the two measurement points. We conducted an analysis of variance to examine whether there are differences in peer pressure between two measurements. Further we performed multiple linear regressions to examine the relationships between the control variables (age and gender), attitudes toward sexting and peer pressure as independent variables, and sexting behavior as a dependent variable. Specifically: (a) the control variables, attitudes and peer pressure at T1 were used to assess associations with sexting behaviors at T1; (b) the control variables attitudes and peer pressure at T1 were used to assess associations with sexting behaviors at T2; and (c) the control variables, attitudes and peer pressure at T2 were used to predict sexting behaviors at T2. Three-step hierarchical multiple regression was conducted to determine whether demographic variables, attitudes toward sexting, and peer pressure had any impact on each of type of sexting behavior. In the first step, the two control variables (age and gender) were entered. In the second step, the variable of sexting attitudes was entered, while in the third step variables the attitude towards sexting and peer pressure were introduced. All statistical analyses were performed with the Statistical Package for Social Sciences v. 17.0 (SPSS Inc, Chicago, IL, USA).

## Results

### *Descriptive Statistics*

We found that on average around 30% of the present sample had engaged in sexting in their lifetime, by receiving, sending or posting sexts. At each time, above 60% of the participants reported that they had received sexts (62.95%, 64,06% at T1 and T2, respectively), with similar rates for girls and boys across time ( $\chi^2(1)= 0.162$ ;  $P=0.687$ ). As for sending sexts, the prevalence was 31% (30.913%, 32.311%, at T1 and T2, respectively) with no

Table 1. Prevalence of Sexting by Age and Gender

Frequency of participants involved in sexting	Time 1	Time 2
Receiving sexts		
Age, mean±SD	16.358±0.659	17.373±0.653
Girls, N (%)	130 (60.19)	128 (59.26)
Boys, N (%)	96 (67.13)	102 (71.33)
Sending sexts		
Age, mean±SD	16.351±0.641	17.413±0.633
Girls, N (%)	49 (22.69)	51 (23.61)
Boys, N (%)	62 (43.36)	65 (45.45)
Posting sexts		
Age, mean±SD	16.312±0.592	17.451±0.567
Girls, N (%)	5 (2.31)	6 (2.78)
Boys, N (%)	27 (18.88)	25 (17.48)

gender differences across time ( $\chi^2(1)=0.001$ ;  $P=0.974$ ). Only a minority of participants at T1 (8.913%) and T2 (8.633%) reported posting sexts, with a higher prevalence among boys than girls. However, the differences in the prevalence of posting sexts at each wave, as well as between boys and girls, were not significant ( $\chi^2(1)=0.152$ ;  $P=0.696$ ).

Overall attitudes toward sexting were more negative than positive. Most of the participants (68%) disagreed that sexting is harmless and healthy. Less than 40% agreed to seeing sexting as “gross” (T1=37.225%; T2=37.882%) and lame (T1=39.386%; T2=37.882%). Several participants strongly agreed or agreed that sexting can be seen as hot (T1=39.554%; T2=38.439%), arousing (T1=37.604%; T2=37.439%), exciting (T1=36.211%; T2=33.146%) or flirty (T1=30.361%; T2=30.918%) and fun behavior (T1=27.854%; T2=22.283%). Finally, almost half of the participants strongly agreed or agreed that sexting is immoral (T1=43.732%; T2=41.782%) or dangerous (T1=54.038%; T2=48.746%). The majority of participants (above 74%) reported seeing sexting as a risky behavior, with negative consequences, where the sext content is usually forwarded to others. Just half and under half of the participants reported that young people are more aggressive when using sexy messages (T1=45.960%;

T2=50.139%) or pictures/videos (T1=46.517%; T2=47.074%) than they are in real life. There was no difference in the sexting attitudes between first and second measurement.

Detailed information about attitudes toward sexting and the differences between the two measurements are shown in Table 2.

Table 2. Attitudes Toward Sexting at T1 and T2 Assessment

Attitudes Toward Sexting	Time 1			Time 2			$\chi^2$ -square test	df	P
	Strongly disagree or disagree N (%)	Neither agree or disagree N (%)	Strongly agree or agree N (%)	Strongly disagree or disagree N (%)	Neither agree or disagree N (%)	Strongly agree or agree N (%)			
Items									
Flirty	178 (49.581)	72 (20.0557)	109 (30.361)	172 (47.909)	76 (21.169)	111 (30.918)	0.229	2	0.891
Arousing	151 (42.060)	73 (20.334)	135 (37.604)	143 (39.832)	80 (22.284)	136 (37.882)	0.542	2	0.762
Hot	149 (41.504)	68 (18.941)	142 (39.554)	152 (42.338)	69 (19.220)	138 (38.439)	0.094	2	0.954
Exciting	152 (42.339)	77 (21.448)	130 (36.211)	161 (44.846)	79 (22.005)	119 (33.146)	0.770	2	0.680
Gross*	150 (41.782)	75 (20.891)	134 (37.225)	158 (44.011)	65 (18.105)	136 (37.882)	0.937	2	0.625
Lame*	157 (43.731)	61 (16.991)	141 (39.275)	152 (42.339)	70 (19.498)	137 (38.160)	0.757	2	0.684
Fun	170 (47.353)	89 (24.791)	100 (27.854)	193 (53.759)	86 (23.955)	80 (22.283)	3.731	2	0.154
Immoral*	122 (33.982)	80 (22.284)	157 (43.732)	131 (36.490)	78 (21.727)	150 (41.782)	0.505	2	0.776
Healthy	228 (63.509)	61 (16.991)	70 (19.227)	234 (65.180)	73 (20.334)	52 (14.483)	3.808	2	0.148
Dangerous*	104 (28.968)	61 (16.991)	194 (54.038)	118 (32.868)	66 (18.384)	175 (48.746)	2.058	2	0.357
Harmless	243 (67.687)	60 (16.713)	56 (15.598)	244 (67.965)	67 (18.662)	48 (13.370)	1.003	2	0.605
How much do you agree or disagree with each of the following statements?									
People my age are more forward/ aggressive using sexy messages than they are in real life	109 (30.361)	85 (23.676)	165 (45.960)	103 (28.690)	76 (21.169)	180 (50.139)	1.325	2	0.515
People my age are more forward/ aggressive using sexy pictures/ videos than they are in real life	112 (31.197)	80 (22.284)	167 (46.517)	109 (40.361)	81 (22.562)	169 (47.074)	0.059	2	0.970
Sending personal sexy messages is no big deal	291 (81.050)	40 (11.142)	28 (7.799)	284 (79.108)	39 (10.863)	36 (10.027)	1.098	2	0.577
Sending personal sexy pictures/ videos is no big deal	310 (86.350)	26 (7.242)	23 (6.406)	298 (83.008)	37 (10.306)	24 (6.685)	2.179	2	0.336
Sending personal sexy messages can have serious negative consequences*	58 (16.155)	29 (8.077)	272 (75.765)	51 (14.206)	24 (6.685)	284 (79.107)	1.180	2	0.554

Continuation of Table 2. Attitudes Toward Sexting at T1 and T2 Assessment									
Attitudes Toward Sexting	Time 1			Time 2			$\chi^2$ -square test	df	P
	Strongly disagree or disagree N (%)	Neither agree or disagree N (%)	Strongly agree or agree N (%)	Strongly disagree or disagree N (%)	Neither agree or disagree N (%)	Strongly agree or agree N (%)			
Personal sexy messages usually end up being seen by more than just those to whom they were sent*	47 (13.091)	43 (11.977)	269 (74.930)	49 (13.648)	26 (7.242)	284 (79.108)	4.637	2	0.098
Sending personal sexy pictures/videos can have serious negative consequences*	38 (10.584)	25 (6.963)	296 (82.450)	41 (11.419)	19 (5.292)	299 (83.286)	0.947	2	0.622
Personal sexy pictures/videos usually end up being seen by more than just those to whom they were sent*	47 (13.091)	39 (10.863)	273 (76.044)	41 (11.420)	39 (10.863)	279 (77.715)	0.474	2	0.788

\*Items reverse coded when calculating scores.

Table 3. Peer Pressure at T1 and T2 Assessment				
Peer pressure	Time 1*	Time 2*	F	P
Peer relations	1.625±0.569	1.503±0.533	8.863	0.003
Physical appearance	1.410±0.516	1.513±0.611	5.904	0.015
Relations with parents	1.771±0.762	1.620±0.739	7.218	0.007
Risk behaviour	1.296±0.589	1.532±0.707	23.649	0.000
Behaviour in school	2.277±0.865	2.05±0.812	12.482	0.000

\*Data presented as mean ± SD.

When examining the differences between the two measurement time points on peer pressure, we found significant differences, with scores for peer relations, relations with parents and behavior at school being higher at T1, while scores for physical appearance and risk-taking behavior were higher at T2 (Table 3).

## Main Analyses

The results of the hierarchical regression analysis are presented in Table 4. The 1<sup>st</sup> stepwise multiple linear regression analysis showed that in all three models, the demographic variable gender was

significantly associated with receiving, sending and posting sexts, while the variable age was only associated with receiving sexts. After controlling for demographic variables in the second step, attitude was found to be a significant predictor of receiving, sending and posting sexts in Model 1 and Model 3. In Model 2, however, attitude was only predictive of receiving and sending sexts. In the final step of the analysis, risk behaviour was found to be a significant predictor for all types of sexting in Models 1 and 3 and for sending and posting in Model 2. In Models 1 and 3, relationship with parents was also a significant predictor for receiving sexting.

**Table 4. Hierarchical Regression Analysis for Experience of Sexting by Demographic Variables, Attitudes toward Sexting and Peer Pressure**

Independent variables	Dependent variables											
	Receiving				Sending				Posting			
	β	R <sup>2</sup>	F	P	β	R <sup>2</sup>	F	P	β	R <sup>2</sup>	F	P
<b>Model 1 Sexting (T1)</b>												
Step 1	-	0.048	9.167	-	-	0.071	13.609	-	-	0.045	8.570	-
Age	0.098	-	-	0.045	0.047	-	-	0.329	-0.011	-	-	0.810
Gender	0.186	-	-	0.000	0.249	-	-	0.000	0.203	-	-	0.000
Step 2		0.147	20.387			0.139	19.168			0.072	9.242	
Age	0.091	-	-	0.064	0.038	-	-	0.440	-0.022	-	-	0.674
Gender	0.076	-	-	0.153	0.169	-	-	0.002	0.162	-	-	0.004
Attitudes towards sexting (T1)	0.331	-	-	0.000	0.269	-	-	0.000	0.161	-	-	0.004
Step 3	-	0.324	20.947	-	-	0.238	13.664	-	-	0.083	6.457	-
Age	0.041	-	-	0.356	0.016	-	-	0.750	-0.023	-	-	0.648
Gender	0.015	-	-	0.761	0.100	-	-	0.059	0.108	-	-	0.057
Attitudes towards sexting (T1)	0.203	-	-	0.000	0.174	-	-	0.001	0.104	-	-	0.071
Peer relations (T1)	-0.084	-	-	0.149	0.021	-	-	0.733	0.021	-	-	0.752
Physical appearance (T1)	-0.015	-	-	0.790	-0.019	-	-	0.760	0.044	-	-	0.505
Relations with parent (T1)	0.246	-	-	0.000	0.092	-	-	0.114	-0.004	-	-	0.952
Risk behaviour (T1)	0.339	-	-	0.000	0.306	-	-	0.000	0.219	-	-	0.000
Behaviour in school (T1)	-0.014	-	-	0.783	-0.037	-	-	0.503	-0.065	-	-	0.270
<b>Model 2 Sexting (T2)</b>												
Step 1		0.071	13.246	-	-	0.077	14.938			0.073	9.166	
Age	0.129	-	-	0.013	0.048	-	-	0.0317	0.043	-	-	0.407
Gender	0.223	-	-	0.000	0.261	-	-	0.000	0.212	-	-	0.000
Step 2		0.119	15.465	-	-	0.115	15.366			0.073	9.166	
Age	0.124	-	-	0.015	0.044	-	-	0.383	0.043	-	-	0.407
Gender	0.164	-	-	0.003	0.215	-	-	0.000	0.212	-	-	0.000
Attitudes towards sexting (T1)	0.217	-	-	0.000	0.188	-	-	0.000	0.099	-	-	0.078
Step 3		0.146	7.217	-	-	0.176	9.288			0.161	8.223	
Age	0.104	-	-	0.043	0.013	-	-	0.791	0.021	-	-	0.672
Gender	0.149	-	-	0.009	0.183	-	-	0.000	0.148	-	-	0.008
Attitudes towards sexting (T1)	0.167	-	-	0.004	0.108	-	-	0.052	0.003	-	-	0.958
Peer relations (T1)	-0.004	-	-	0.957	-0.018	-	-	0.770	0.017	-	-	0.800
Physical appearance (T1)	0.054	-	-	0.426	0.054	-	-	0.407	0.056	-	-	0.393
Relations with parents (T1)	0.095	-	-	0.133	0.108	-	-	0.075	0.017	-	-	0.773



Continuation of Table 4. Hierarchical Regression Analysis for Experience of Sexting by Demographic Variables, Attitudes toward Sexting and Peer Pressure

Independent variables	Dependent variables											
	Receiving				Sending				Posting			
	$\beta$	R <sup>2</sup>	F	P	$\beta$	R <sup>2</sup>	F	P	$\beta$	R <sup>2</sup>	F	P
Risk behaviour (T1)	0.041	-	-	0.516	0.129	-	-	0.036	0.248	-	-	0.000
Behaviour in school (T1)	0.0455	-	-	0.447	0.072	-	-	0.206	0.062	-	-	0.286
Model 3 Sexting (T2)												
Step 1	-	0.079	14.442	-	-	0.080	14.998	-	-	0.064	11.481	-
Age	0.130	-	-	0.009	0.058	-	-	0.241	0.047	-	-	0.344
Gender	0.237	-	-	0.000	0.265	-	-	0.000	0.236	-	-	0.000
Step 2		0.176	23.636			0.137	17.968			0.095	11.747	-
Age	0.089	-	-	0.080	0.021	-	-	0.687	0.023	-	-	0.662
Gender	0.254	-	-	0.000	0.288	-	-	0.000	0.255	-	-	0.000
Attitudes towards sexting (T2)	0.302	-	-	0.000	0.224	-	-	0.000	0.161	-	-	0.003
Step 3	-	0.277	15.692	-	-	0.222	11.975	-	-	0.180	9.025	-
Age	0.057	-	-	0.240	-0.004	-	-	0.936	0.003	-	-	0.952
Gender	0.145	-	-	0.005	0.182	-	-	0.000	0.139	-	-	0.012
Attitudes towards sexting (T2)	0.182	-	-	0.000	0.119	-	-	0.025	0.076	-	-	0.163
Peer relations (T2)	-0.067	-	-	0.301	0.017	-	-	0.799	0.119	-	-	0.088
Physical appearance (T2)	0.124	-	-	0.078	0.003	-	-	0.971	-0.118	-	-	0.122
Relations with parents (T2)	0.195	-	-	0.006	0.120	-	-	0.095	0.146	-	-	0.052
Risk behaviour (T2)	0.135	-	-	0.031	0.212	-	-	0.000	0.256	-	-	0.000
Behaviour in school (T2)	0.025	-	-	0.702	0.046	-	-	0.490	-0.040	-	-	0.560

## Discussion

Taking a variety of findings into account, including those related to research findings, experiences of child and youth care professionals, media stories, and even government action, sexting is today attracting attention worldwide. The dynamic and now scientifically propulsive field of sexting points to the great and urgent need for recent findings of research of motivational determinants of sexting. Although a great deal of effort has been invested in studying the motivational determinants of sexting, few researchers have studied students' attitudes and peer pressure in relation to sexting. The aim of this

study was to fill this gap in the research by examining whether students' attitudes towards sexting and peer pressure varied over the one-year time frame of the study, and whether those variables predicted sexting, taking into account both age and gender.

According to the results of this study that was conducted among adolescents, about 30% of the studied sample reported engaging in at least one type of sexting behaviour. The prevalence of sexting in the current study was higher than that found in a study previously conducted. For example, Madigan et al. (6), in their meta-analysis of 39 studies conducted on adolescents (age range, 11.9-17.0 years), found prevalence rates between 8.4 % to 27.4%,

with a mean prevalence of 14.8 % for sending sexts, 27.4 % for receiving sexts, and 8.4 % for having forwarded sexts without consent. A recent systematic review by Mori et al. (42) of 50 studies with emerging adults ( $\geq 18$  -  $< 29$ ) found that sexting was common, with a frequency of 38.3 % for sending, 41.5 % for receiving and 47.7 % for reciprocal sexting. The findings of the systematic review and meta-analysis of a higher prevalence of receiving than sending sexts support our data. The broad definition of sexting, as used in our study, could contribute to higher prevalence rates (43). Further, as some findings have shown before (44), most adolescents discuss their negative perceptions and attitudes towards sexting, perhaps indicating the influence of traditional culture on sexual behaviours. However, our study found that half the participants perceived that other peers are more prone to sexting, suggesting that adolescents' tendency to overestimate peers sexual behaviour (45) may be related to the higher prevalence of sending and receiving sexting. However, in line with previous studies (38, 46-49) the lower rate of posting compared to other types of sexting may be because this type of sexting implies a greater level of involvement, and represents the most compromising and potentially risky of all these behaviours (49).

When examining the differences between the two measurement time points on peer pressure, we found significant differences, with scores for peer relations, relations with parents and behaviour at school being higher at T1, while scores for physical appearance and risk-taking behaviour were higher at T2. According to study result, we can assume that peer pressure can change over time due to an individual and group dynamics within adolescents social circles. Factors such as developmental changes, changing social circles, peer group norms, social status, and personal values can influence how adolescents perceive and respond to pressure over time (29, 30). Understanding these factors can help professionals, parents, and adolescents themselves navigate the challenges of peer pressure and promote healthy decision-making and

social relationships during this important developmental period.

The age differences in sexting found in our sample of adolescents, are in agreement with recent studies (50-53), which reported sexting behaviours are more common amongst older than younger adolescents. As Molla-Espanrza et al. (51) suggested this age dynamic in sexting may be a combination of the possibilities offered by technology and age-typical sexual needs. Adolescence is a period of increased sexual need, and this may be satisfied using new technology.

Regarding gender, our findings suggest that boys are more prone to sending, receiving or posting sexts than girls, which is in line with the findings of some other studies (13, 47, 51, 54-56). This result may be explained by gender double standards, with higher social approval of boys involved in sexting, and more stigmatization of girls involved in the same behaviour (24). As it is perceived negatively by society (e.g. as promiscuity, low self-esteem, insecurity; 24, 57), the consequences of sexting are more likely to be negative among girls, such as being insulted or humiliation (23, 58, 59), so they may have a more cautious view of sexting. However, by participating in sexting boys may have positive consequences, such as strengthening their social status or popularity among their peers (24, 60), which could contribute to the development of a positive attitude towards sexting (61) and engaging in it.

The relationships between attitudes and sexting behaviour suggest that positive attitudes toward sexting precede actual sexting behaviour in terms of receiving and/or sending and posting sexually explicit content, and even lead to future receiving and sending sexts. From the obtained data it may be inferred that attitudes have a significant influence on the participation in sexting behaviour (receiving and/or sending sexts). Previous studies also have demonstrated a relationship between sexting and positive attitudes (19, 20). Our study provides evidence of a direct pathway between sexting and attitudes. We found support for predicting posting based on attitudes toward sexting.

There may be some difference in attitudes towards young people's behaviour involving posting sexually explicit content, which is usually related with violent behaviour (62), from others types of sexting, such as receiving and sending sexts.

Moreover, we found that practicing risky behaviours that are approved and encouraged by peers, is a significant predictor not only of posting sexts but also of others two types of sexting, and have significant predictive value for future engagement in sexting. Peer effects in relation to a wide range of risky behaviour have been confirmed in previous study (63). However, the relationship between peer effects in connection with risky behaviour and sexting is indirectly supported by some earlier findings about the positive relationship between sexting and various types of risk behaviour, such as risky sexual behaviour (43, 64), aggressive behaviours (38, 65), delinquency and variety of delinquent acts (66), and alcohol or substance abuse (32, 67). The fact that peer effects in the field of risk behaviours have a consistent, stable influence on sexting behaviour over time points toward the longer lasting mechanisms of peers in risky behaviour, probably because of the strong interrelationship between risky behaviour and sexting. Our data infer that adolescents who are prone to risk behaviour in early/mid adolescence will continue these activities during middle/late adolescence. However, we must note that some forms of risk behaviour (e.g. alcohol use), which are under the influence of peers, can for some adolescents play a constructive role in their development, and contribute to the fulfilment of some developmental tasks (e.g. establishing a relationship) (19).

The present study found that adolescents who are prone, due to a peer pressure, to break parental rules are more likely to participate in some types of sexting. Peer influence is undoubtedly ubiquitous during adolescence, and the influence of peers on their relationship with their parents, and then consequently on sexting, can be explained by referring to coercion theory. This finding was expanded by the recent work conducted by Norman (68) concerning the role of parenting behaviour and

attachment in relation to adolescent sexting. The authors identified the significant direct effect of poorer parent-child communication and attachment avoidance on a higher prevalence of sending sexts, and the indirect effect of parental warmth and parental psychological control on sending sexts, through attachment. The findings about significant peer influence leading to violations of parental rules (peer influence on the parental relationship) in relation to sexting may also be explained by the fact that poorer relationships between parents and adolescents reflects less communication between the parent and child, and/or decreased parental supervision, which in turn is linked with more risky behaviour, such as sexting. Confalonieri et al. (10) in their study among adolescents, aged 14 to 19 years found parental awareness about activities and peers may decrease adolescent engagement in sexting behaviours. Further, some other recent study (69) consistently showed that the absence of parent social control increases the likelihood of sexting. The fact that the relationship with parents was associated with all types of sexting at the second measurement point, and only with receiving sexts at the first measurement point, may suggest that family functioning may be particularly important in late adolescence. In late adolescence, young people usually perceive their parents as more supportive (70), and as a result those young people who feel equal to their parents may comply with their parents' suggestions about risk behaviours, whereas those with a desire for more autonomy may tend to neglect their parents' suggestions and adopt their peers'. Hence, parental influence may seem to be more determinant in late adolescence, since this is a period of a more expressed interest in sexuality than early adolescence (32, 65).

### Limitations and Future Research

Some limitations in this study should be addressed. It cannot be excluded that the data obtained are restricted to the sample of Bosnia and Herzegovina, limiting generalization of data to other countries. It might be an interesting issue for future studies to

explore a culturally diverse sample, as well as more representative samples. Next, to be able to capture sexting and its predictors, more specific operationalization of sexting might be required. For instance, we used a broad definition of receiving, sending and posting sexts, but excluded the form of communication used for sexts (e.g. text, photos or videos), the degree of nudity in sexts, the degree of consent for sexting, and even the context of sexting (e.g. in an intimate relationship, friendship etc.). Future research on other types of sexting behaviour is needed. Next, the findings would have benefited from inclusion of different components of attitudes towards sexting, as well as the inclusion of a variety of other variables, such as: ethnicity, sexual orientation, quality of peer relationships, parenting style etc. Lastly, to be able to assess the change trajectories of sexting and its relationship with examined variables, future studies should use a larger number of waves. The time span between the two measurements was one year, but to measure changes in the period of adolescence, which is a fast-moving and turbulent period, it is necessary to take a shorter period of time between data collection and with more waves. Beyond these limits, our findings emphasize the important role that gender, age, attitudes and peer pressure have in predicting sexting. The data obtained have significant implications. These results suggest that preventive strategies designed to mitigate the negative consequences of sexting should focus specifically on boys and older youth with positive attitudes toward sexting. Preventive intervention should also focus on peer effects, whereas professionals should pay attention to the influence of peers on risk behaviours, the parental relationship and physical appearance. It seems important to help youth find strategies to resist peer pressure and influence. Moreover, developing positive interaction between parents and adolescents can be crucial in moderating the influence of peers.

## Conclusion

The relevance of age and gender factors as crucial for sexting has been proven repeatedly. Up to now,

knowledge of attitudes and peer pressure in explaining sexting has been incomplete because there were no studies that explicitly investigated these aspects together. The current study thus contributes to a better understanding of various types of sexting, by examining age, gender, attitudes and peer pressure in a sample of Bosnian and Herzegovina adolescent girls and boys. Considering the overall results of the current study, the findings suggest that sexting is more prevalent among older adolescents and boys, compared to younger adolescents and girls. As the data indicate, youth particularly have more negative than positive attitudes towards sexting, and usually perceive its negative consequences. Engaging in sexting is associated with positive attitudes toward sexting, as well as the influence of peers on risk behaviours, and the parental relationship. The results may help to identify adolescents who are particularly at risk of experiencing sexting, and thus provide suggestions for preventive approaches. Preventive approaches should bring up the topic of attitudes and peer pressure in the school context. Hence, approaches are needed that strengthen the involvement of peers and parents in the relationship with adolescents, since peers and the parental relationship with adolescents may be crucial regarding their experience of sexting.

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