Cyberaggression among Adolescents: Prevalence and Gender Differences

Ciberagresión entre adolescentes: prevalencia y diferencias de género

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ABSTRACT

The objective of the present work is to analyse the prevalence of cyber-aggression and cyber-victimization among adolescents in Asturias (Spain) and to identify possible gender differences. To this end, 3,175 adolescents aged 12 to 18 years were randomly selected from the student population attending compulsory secondary education in Asturias and assessed. They completed three self-reported tests: an ad hoc questionnaire on sociodemographic data and communication technologies management; the "Cyber-aggression Questionnaire for Adolescents" (CYBA), to assess how frequently adolescents acknowledge having exercised various cyber-aggressive behaviours in the previous three months; and the "Cyber-victimization Questionnaire for Adolescents" (CYVIC), to assess how frequently adolescents acknowledge having been a victim of various types of cyber-aggression in the previous three months. The results obtained show a high variation in prevalence based on the type of cyber-aggression or cyber-victimization analysed. Verbal cyber-aggression and online exclusion are more common than impersonation and visual cyber-aggression. There are generally no statistically significant differences between boys and girls. When differences do appear, boys generally tend to be more aggressive than girls, while girls are more likely to be victims. However, these differences are either small or very small. The implications of these results for future research and educational treatment of the problem are discussed.

RESUMEN

El presente trabajo tiene como objetivos analizar la prevalencia de la ciberagresión y la cibervictimización entre adolescentes en Asturias (España) e identificar posibles diferencias de género. Para ello, fueron evaluados 3.175 adolescentes, de 12 a 18 años, seleccionados aleatoriamente de entre la población de estudiantes de Educación Secundaria Obligatoria de Asturias. Se aplicaron tres autoinformes: un cuestionario «ad hoc» sobre datos sociodemográficos y manejo de tecnologías de comunicación; el «Cuestionario de Ciberagresión para Adolescentes» (CYBA), para evaluar con qué frecuencia el adolescente evaluado reconoce haber ejercido diferentes conductas de ciberagresión durante los últimos tres meses; y el «Cuestionario de Cibervictimización para adolescentes» (CYVIC), para evaluar con qué frecuencia el adolescente reconoce haber sido víctima de diferentes tipos de ciberagresión en los últimos tres meses. Los resultados obtenidos muestran una prevalencia muy variable en función del tipo de ciberagresión o cibervictimización analizado. La ciberagresión verbal y la exclusión online son más habituales que la suplantación y la ciberagresión visual. Por lo general, no existen diferencias estadísticamente significativas entre chicos y chicas. En los casos en que existen, la tendencia general es que los chicos son más agresores que las chicas y estas más víctimas que los chicos, si bien las diferencias son pequeñas o muy pequeñas. Se discuten las implicaciones de estos resultados para la investigación futura y el tratamiento educativo del problema.

KEYWORDS | PALABRAS CLAVE

Cyberaggression, cybervictimization, adolescence, secondary school, prevalence, gender, social networks.
Ciberagresión, cibervictimización, adolescencia, educación secundaria, prevalencia, género, redes sociales.

1. Introduction

Electronic communication devices have become an essential means of adolescent socialization, and appropriate use of these devices is thus a necessary educational goal. These devices offer great advantages in terms of establishing new friendships and keeping in contact with family and friends. However, improper use may involve risks. Electronic communication devices can be used to intentionally damage, disturb or harm (i.e., attack) individuals or groups. Generally, the terms "cyber-aggression" and "cyber-victimization" are used to refer to situations in which a person attacks or is attacked via electronic communication devices (Corcoran, McGuckin, & Prentice, 2015).

Cyber-aggression possesses characteristics and effects that make it particularly problematic and worthy of attention. Compared with traditional forms of violence, aggression via electronic device helps to protect aggressors' anonymity and thus abets disinhibition of conduct. In many cases, the aggressor does not witness the consequences of his or her actions on the victim, which hinders empathizing with him or her. Aggression may occur at any time or place, which complicates monitoring and control on the part of adults. In addition, harmful content can be sent to many people in a very short time, which amplifies harm to victims (Hinduja & Patchin, 2015). Cyber-aggression can have significant negative effects, not only on the victim but also on the aggressor. Cyber-victimization has been associated with an increase in internalised problems, mainly related with depressive symptomatology. In adolescents, such symptoms may adversely affect concentration and academic performance (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). Cyber-aggressors may perceive that their inappropriate behaviour is encouraged, which can favour its generalization to other areas and situations (Yahner, Dank, Zweig, & Lachman, 2015). Detecting cyber-aggression may lead to significant legal consequences for those who exercise or enable it (Paul, Smith, & Blumberg, 2012).

Determining the prevalence of cyber-aggression among adolescents is difficult. The few published studies with Spanish samples differ regarding the indicators that define the construct and the methodology used (mainly, sample characteristics, time period of inquiry, scale values used and result format in means or percentages). However, the results do reveal a trend. The most common types of cyber-aggression and cyber-victimization are "verbal cyber-aggression" (harmful comments online; threatening or insulting text messages; frightening anonymous calls) and "exclusion" (deliberately excluding a person from an online group). Conversely, the least common type is "visual cyber-aggression", including both "sexual cyber-aggression" (recording or photographing and disseminating compromising private images) and "happy slapping" (physically assaulting or forcing a person to perform a humiliating action, recording it and disseminating it). When "impersonation" is included in the analysis, its prevalence levels are higher than for visual aggression and closer to those for verbal aggression and exclusion (Buelga, Cava, Musitu, & Torralba, 2015; Calvete, Orue, Estévez, Villardón, & Padilla, 2010; Díaz-Aguado, Martínez, & Martín, 2013; Garaigordobil, 2015). To the best of our knowledge, no study on cyber-aggression prevalence in Asturias (Spain), in which adolescents report as victims or aggressors and which uses a specific sample that is broad and representative of the region, has yet been published.

A key aspect to understanding the problem, which has educational implications, is to observe whether there are significant differences between boys and girls in the frequency and manner with which they exercise or experience cyber-aggression. Given that boys and girls make differential use of mobile phones and the Internet (Fernández, Peñalva, & Irazabal, 2015) and that there are gender differences in on-site aggression (Card, Stucky, Sawalani, & Little, 2008), it is plausible that there are also differences in cyber-aggression. However, studies on the subject yield inconsistent results. A recent systematic review (Navarro, 2016) displays six patterns of results, which are, in order of frequency: no differences in cyber-aggression or in cyber-victimization based on gender; boys more frequently act as aggressors and girls as victims; boys become aggressors and victims more frequently than girls; boys act as aggressors more frequently than girls, but there are no differences in victimization; there are no differences in aggression, but girls are victims more frequently than boys; and finally, girls act as aggressors and victims more frequently than boys. One possible way to clarify the relationship between gender and cyber-aggression is to precisely delineate the situations that are considered cyber-victimization and cyber-aggression and to analyse possible specific differences in the different types of circumstances that define the construct.

For this reason, the present study has two objectives. First, the study aims to analyse the prevalence of cyber-aggression and cyber-victimization among adolescents in Asturias. A pattern consistent with that reported in the few studies on the topic previously published in Spain is expected to be found. Second, the study intends to identify possible gender differences in the prevalence of cyber-aggression and cyber-victimization. No large differences are anticipated, or if found, boys are expected to become aggressors more commonly than girls and girls to become victims more frequently than boys.

2. Material and methods

2.1. Participants

The sample universe comprises the total number of adolescents in Asturias in compulsory secondary education (CSE) and studying in educational centres supported by public funds (public and state-subsidised) in the region. According to data provided by the statistics service of the Regional Ministry of Education and Culture, during the 2014/15 academic year, 30,758 students (97.6% of the total number of students in CSE in Asturias) were enrolled in these schools.

The sample analysed in this study was selected through random stratified and cluster sampling. To this end, the population of the CSE centres supported by public funds in Asturias was divided into seven geographical areas. In each one of these, a number of centres proportional to the total number of centres in that population area was randomly selected. As a result, 19 centres were ultimately selected. In each selected centre, all CSE students were assessed, yielding a total of 3,175 students aged between 12 and 18 years (M=14.01, DT=1.39) actually assessed.

The proportional allocation of centres to each geographical area ensured sample representativeness in terms of geographic location. The centres are located in both urban and rural environments and receive students from heterogeneous socio-economic levels. The aim of the random selection of centres within each geographical area was to provide a sample that was also representative of the population in terms of other relevant variables such as gender, grade year or centre ownership. As shown in table 1, the sample presents a percentage similar to that of the population in terms of ownership, grade year and gender.

2.2. Assessment tools

"Ad hoc questionnaire on sociodemographic data and management of communication technologies". Composed of 11 items, it gathers information on students' age, gender and grade year as well as the incidence and frequency of use of electronic communication devices. The age and grade year were evaluated via two open questions. The other variables were evaluated using dichotomous or multiple-choice items.

"Cyber-aggression Questionnaire for Adolescents" (CYBA) (Álvarez-García, Barreiro-Collazo, Núñez, & Dobarro, 2016). The CYBA is a self-reported questionnaire that is composed of 19 items with a Likert-type response format in which the adolescent must indicate how frequently he or she has exercised the aggression described in each statement via mobile phone or the Internet

Table 1. Sample and population, in terms of the variables ownership, grade year and gender			Sample		Population	
			N	%	N	%
Centre	Ownership	Public	11	57.9	85	59.9
		State-subsidised	8	42.1	57	40.1
		Total	19	100	142	100
Students	Grade year	1st CSE	900	28.3	8,144	26.5
		2nd CSE	805	25.4	7,855	25.5
		3rd CSE[a]	772	24.3	7,553	24.6
		4th CSE[a]	698	22	7,206	23.4
		Total	3,175	100	30,758	100
	Gender	Male	1,631	52	16,082	52.3
		Female	1,504	48	14,676	47.7
		Total	3,135[b]	100	30,758	100

[a] Curricular diversification students are included.
[b] Forty students (1.3% of the total) did not provide their gender.

in the previous three months (from 1=Never to 4=Always). After exploratory and confirmatory factorial analysis, the test provides a structure composed of three factors ("impersonation", α=.87; "visual-sexual cyber-aggression", α=.79; and "verbal cyber-aggression and exclusion", α=.91) and four additional indicators of "visual cyber-aggression-teasing/happy slapping".

"Cyber-victimization questionnaire for adolescents" (CYVIC). Self-reported, it assesses how frequently the informant has been the victim of attacks via mobile phone or the Internet during the previous three months. It consists of 19 statements, with the same indicators and response format (from 1=Never to 4=Always) as the CYBA. After exploratory and confirmatory factorial analysis, the test provides a structure composed of four factors ("impersonation", α=.81; "visual-sexual cyber-victimization", α=.77; "verbal cyber-victimization", α=.87; and "online exclusion", α=.73) and four additional indicators of "visual cyber-victimization-teasing/happy slapping". The facto-

rial structure of CYVIC is the same as that of the CYBA, except that the items in the "verbal cyber-aggression and exclusion" factor are split into two factors: "verbal cyber-victimization" and "online exclusion".

2.3. Procedure

After selecting the educational centres, authorization to administer the questionnaires was requested from the centres' respective management teams. The latter were informed of the study's objectives and procedures, the anonymous and voluntary participation of students, and the confidential treatment of the results. As participants were underage, permission was requested from their families through passive consent. The teenagers were evaluated during the second or third trimester of the 2014/15 academic year, depending on the availability of each centre. Before answering the questionnaire, teenagers were also informed of the study's objectives and of its anonymous, confidential and voluntary nature. In general, students had 20 minutes to answer, although this period was flexible depending on the age and characteristics of the respondents. The test was administered to all CSE groups in each centre during school hours.

2.4. Data analysis

After the data were obtained, the information was analysed with the statistical package SPSS 21.0 (IBM Corp., 2012). First, the percentage of participants using different electronic communication devices and applications was analysed, as well as the association between use and gender. Then, the prevalence of cyber-aggression and cyber-victimization among the adolescents was analysed in terms of frequency and percentages. Finally, the possible association between prevalence and gender was examined. Due to the low reported frequency of cyber-aggression and cyber-victimization, the responses to the CYBA and CIVIC questionnaires were reclassified into two response options: "Never" and "At least once".

The option "At least once" resulted from grouping the original options "Rarely", "Often" and "Always". The existence of a statistically significant association between the variables studied and gender was analysed using Pearson's chi-squared test. The magnitude of the association was analysed using Cramer's V.

Table 2. Gender differences in the use of electronic communication devices					
	N	Total (%)	M/W (%)	$X^2_{(df)}$	V
A) I own a cellphone.	3,127	95.1	95.3/94.9	$0.194_{(1)}$	.008
B) In my free time, I participate in social networks (Tuenti, Facebook or other).	3,122	77.8	72.4/83.7	$57.933_{(1)}$***	.136
C) In my free time, I use instant messaging programs (Messenger, WhatsApp or other).	3,121	93.6	91.3/96.0	$28.049_{(1)}$***	.095
D) I have a personal email account.	3,117	92.7	92.3/93.2	$0.985_{(1)}$	.018
E) I play online with other people.	3,120	52.0	75.9/25.9	$779.344_{(1)}$***	.500
F) I surf the Internet in my free time for tasks other than homework.	3,118	84.1	85.2/83.0	$2.671_{(1)}$	.029
G) In general, how many hours per day do you spend using the Internet for tasks other than homework from Monday to Friday?	3,119			$20.629_{(4)}$***	.081
None		4.6	5.2/3.9		
Less than an hour		21.7	22.5/20.9		
Between one and two hours		30.7	32.8/28.5		
Between two and three hours		18.1	17.4/18.8		
More than three hours		24.9	22.1/28.0		
H) In general, how many hours per day do you spend using the Internet for tasks other than homework during the weekends?	3,122			$17.067_{(4)}$**	.074
None		3.5	4.0/3.0		
Less than an hour		14.1	15.4/12.6		
Between one and two hours		22.4	23.7/21.0		
Between two and three hours		18.5	18.5/18.4		
More than three hours		41.5	38.4/44.9		

% = percentage of affirmative answers; M = Men, W = Women.
*p≤.05; **p≤.01; ***p≤.001

3. Results
3.1. Use of mobile phones and the Internet

The use of mobile phones, instant messaging and email is almost universal among the adolescents assessed. Over 90% of them reported having access to these resources (table 2). Browsing the Internet to complete non-school related tasks is also very common, as is using social networks (although the minimum legal age in Spain for its use is 14). Playing online games with others is less common, particularly among girls.

Within its high percentage of general use, the use of social networks (p<.001) and of instant messaging programs (p<.001) is more common among girls than boys (table 2). Girls also use the Internet to perform non-school related tasks for more hours than boys, both from Monday to Friday (p<.001) and during the weekends (p=.002). In contrast, boys play online with other people significantly more frequently than girls (p<.001). There are no statistically significant differences in the percentage of boys and girls who have a mobile phone or personal email account or who browse the Internet in their free time for non-school related tasks.

3.2. Prevalence of cyber-aggression and cyber-victimization

The percentage of adolescents who reported having exercised or experienced aggression via mobile phone or the Internet during the previous three months is very variable, depending on the kind of aggression analysed (tables 3 and 4). However, for most indicators, the percentage of participants involved is low or very low. Both in the case of cyber-aggression and cyber-victimization, verbal abuse and online exclusion are more common than visual aggression and impersonation. More specifically, the most common types of cyber-aggression and cyber-victimization are phone pranks in which, when the receiver picks up, the caller does not answer (item 5) and insults via text message or instant messaging programs (item 11). The least common are the recording and dissemination of physical aggression (item 10) or humiliating acts performed under threat (item 15).

Table 3. Prevalence of cyber-aggression		1		2		3		4	
	N	f	%	f	%	f	%	f	%
Impersonation									
1. I have pretended to be someone else on the Internet, posting comments under his or her name as if I were that person.	3,143	2,983	94.9	135	4.3	23	0.7	2	0.1
12. I have pretended to be someone else on Twitter, Tuenti, etc., creating a false user profile (photo, personal data, etc.) through which I insulted or ridiculed others.	3,144	3,091	98.3	44	1.4	6	0.2	3	0.1
18. I have obtained the password of another person and have sent annoying messages to acquaintances as if it had been him or her to get that person into trouble.	3,136	3,052	97.3	74	2.4	7	0.2	3	0.1
Visual - Sexual									
2. I have taken photos or made video recordings without consent involving sexual or suggestive content (e.g., on the beach, in a locker room, etc.) and have disseminated them via mobile phone or the Internet.	3,145	3,082	98.0	53	1.7	8	0.3	2	0.1
9. I have disseminated genuine compromising images or videos belonging to another person of a sexual or suggestive nature without permission via mobile phone or the Internet.	3,143	3,067	97.6	67	2.1	7	0.2	2	0.1
14. I pressed a person to perform actions he or she did not want to perform (regardless of whether he or she finally agreed to perform them), threatening him/her with disseminating intimate conversations or images.	3,143	3,066	97.6	70	2.2	6	0.2	1	0.0
Visual - Teasing / Happy slapping									
3. I have posted fake photos (modified) of other people on the Internet to harm them or laugh at them.	3,139	3,035	96.7	91	2.9	12	0.4	1	0.0
6. I have posted compromising photos or videos of a certain person on the Internet without permission, to harm or laugh at him or her.	3,137	3,078	98.1	51	1.6	8	0.3	0	0.0
10. I have hit a person, recorded the scene and then disseminated it.	3,144	3,108	98.9	25	0.8	9	0.3	2	0.1
15. I have forced a person to perform a humiliating action, recorded it and then disseminated it to make fun of him/her.	3,136	3,108	99.1	21	0.7	6	0.2	1	0.0
Verbal and Online exclusion									
4. I have removed from or not accepted in the contact list of a chat room, social network or instant messaging program another person without a specific reason, just because it was him or her.	3,138	2,460	78.4	568	18.1	97	3.1	13	0.4
5. As a prank, I have called a mobile phone, and when the recipient answered, I refused to answer back.	3,145	2,353	74.8	630	20.0	141	4.5	21	0.7
7. I have made calls to insult or to make fun of a person.	3,145	2,738	87.1	339	10.8	57	1.8	11	0.3
8. I have made fun of a person using offensive or insulting comments on social networks.	3,143	2,755	87.7	345	11.0	35	1.1	8	0.3
11. I have insulted a person via text message (SMS) or instant messaging programs (e.g., WhatsApp).	3,142	2,220	70.7	774	24.6	121	3.9	27	0.9
13. I have falsely complained about a person in forums, social networks or online games to have them removed.	3,146	2,886	91.7	210	6.7	40	1.3	10	0.3
16. I have agreed with other people to ignore a person on social networks.	3,144	2,724	86.6	363	11.5	43	1.4	14	0.4
17. I have made anonymous calls to threaten or intimidate a person.	3,141	3,019	96.1	95	3.0	21	0.7	6	0.2
19. I have posted rumours about a person on a social network.	3,136	2,894	92.3	210	6.7	28	0.9	4	0.1

1=Never; 2=Rarely; 3=Often; 4=Always.

3.3. Gender differences in the prevalence of cyber-aggression and cyber-victimization

As shown in table 5, there are no statistically significant differences in gender for most indicators, and when such differences appear, their magnitude is small or very small.

Regarding cyber-aggression, there are statistically significant differences between boys and girls for 8 of the 19 indicators analysed. In these eight cases, cyber-aggression is more prevalent in boys than in girls. To a greater extent than girls, boys report having obtained a person's password and sent messages to an acquaintance as if they were that person to get him/her into trouble (item 18; p=.001); having taken photos or made video recordings without consent involving sexual or suggestive content and disseminated them via mobile phone or the Internet (item 2; p=.005); having disseminated genuine compromising images or videos of a sexual or suggestive nature belonging to another person without permission via mobile phone or the Internet (item 9; p=.011); having posted fake photos belonging to another person on the Internet to harm or make fun of them (item 3; p<.001); having made calls insulting or mocking another person (item 7; p=.008); having insulted a person via text message or instant messaging programs (item 11; p=.027); having made anonymous calls to threaten or intimidate a person (item 17; p=.001); and having made false complaints about a person in a forum, social network or online game to have that person removed from the site (item 13; p<.001) during the previous three months.

With regard to cyber-victimization, there are statistically significant differences between boys and girls for 4 of the 19 indicators analysed. In three cases, cyber-victimization is more prevalent in girls, and in one case, in boys. A higher percentage of girls compared with boys report having been victims of false rumours on a social network (item 19; p=.002); having received calls to their mobile phones with no response as a prank (item 5; p=.015); or having been pressured into performing actions they did not want to perform because they were threatened with the dissemination of conversations or intimate images (item 14; p=.006) during the previous three months. In contrast, a higher percentage of boys reported having been victims during the previous three months of false complaints in forums, social networks or online games resulting in their removal from the site (item 13; p<.001).

Table 4. Prevalence of cyber-victimization									
		1		2		3		4	
	N	f	%	f	%	f	%	f	%
Impersonation									
1. I have been impersonated on the Internet, and comments have been posted in my name, as if coming from me.	3,156	2,935	93.0	201	6.4	15	0.5	5	0.2
12. I have been impersonated on Twitter, Tuenti, etc., and a false user profile has been created (photo, personal data, etc.) through which I have been insulted or ridiculed.	3,156	3,067	97.2	73	2.3	9	0.3	7	0.2
18. My password has been obtained, and annoying messages have been sent to acquaintances as if coming from me, to get me into trouble.	3,150	2,876	91.3	240	7.6	28	0.9	6	0.2
Visual - Sexual									
2. Photos or video recordings of me have been taken without my consent involving sexual or suggestive content (e.g., on the beach, in a locker room, etc.) and disseminated via mobile phone or the Internet.	3,157	3,054	96.7	92	2.9	8	0.3	3	0.1
9. Genuine compromising images or videos (of a sexual or suggestive nature) of me have been disseminated without my permission via mobile phone or the Internet.	3,154	3,102	98.4	44	1.4	5	0.2	3	0,1
14. I have been forced to perform actions I did not want to perform (regardless of whether I finally agreed to perform them) because I was threatened with the dissemination of conversations or intimate images of me.	3,155	2,966	94.0	162	5.1	24	0.8	3	0.1
Visual - Teasing / Happy slapping									
3. Fake photos of me (modified) have been posted on the Internet to hurt me or laugh at me.	3,152	3,032	96.2	107	3.4	11	0.3	2	0.1
6. Genuine compromising photos or videos of me have been posted on the Internet without my permission to hurt me or laugh at me.	3,152	3,063	97.2	77	2.4	9	0.3	3	0.1
10. I have been hit, and this has been recorded and then disseminated.	3,154	3,119	98.9	28	0.9	4	0.1	3	0.1
15. I have been forced to perform a humiliating action, and this has been recorded and then disseminated to make fun of me.	3,158	3,118	98.7	35	1.1	5	0.2	0	0.0
Verbal									
5. I have received calls on my mobile where the caller remains silent, I suppose as a prank.	3,143	1,366	43.5	1,289	41.0	434	13.8	54	1.7
7. I have received calls insulting or mocking me.	3,147	2,672	84.9	406	12.9	59	1.9	10	0.3
8. I have been made fun of using offensive or insulting comments on social networks.	3,148	2,545	80.8	515	16.4	77	2.4	11	0.3
11. I have received insults via text message (SMS) or instant messaging programs (e.g., WhatsApp).	3,151	2,051	65.1	916	29.1	167	5.3	17	0.5
17. I have received anonymous threatening or intimidating calls.	3,152	2,938	93.2	170	5.4	37	1.2	7	0.2
19. False rumours about me have been published on a social network.	3,153	2,605	82.6	423	13.4	101	3.2	24	0.8
Online exclusion									
4. I have been excluded from or not accepted in the contact list of a chat room, social network (e.g., Tuenti) or instant messaging program (e.g., Messenger, WhatsApp), without having done anything wrong, just because it was me.	3,152	2,605	82.6	462	14.7	73	2.3	12	0.4
13. False complaints have been made about me in forums, social networks or online games, which had me expelled from the group.	3,149	2,890	91.8	202	6.4	48	1.5	9	0.3
16. A group of people have agreed to ignore me on social networks.	3,157	2,969	94.0	164	5.2	16	0.5	8	0.3

1=Never; 2=Rarely; 3=Often; 4=Always.

Table 5. Gender differences in the prevalence of cyber-aggression and cyber-victimization							
	Cyber-aggression				Cyber-victimization		
	N	M/W (%)	$\chi^2_{(df)}$	V	N	M/W (%)	$\chi^2_{(df)}$	V
Impersonation								
1.	3,110	5.6/4.4	$2.185_{(1)}$	.027	3,117	6.8/7.0	$0.051_{(1)}$	.004
12.	3,106	1.9/1.3	$1.651_{(1)}$	.023	3,117	2.4/3.1	$1.258_{(1)}$	.020
18.	3,098	3.6/1.6	$12.041_{(1)}$***	.062	3,112	8.2/9.1	$0.673_{(1)}$	.015
Visual – Sexual								
2.	3,109	2.6/1.2	$8.017_{(1)}$**	.051	3,118	3.5/2.9	$1.080_{(1)}$	.019
9.	3,105	3.0/1.6	$6.424_{(1)}$*	.045	3,115	1.8/1.3	$1.434_{(1)}$	.021
14.	3,105	2.9/1.8	$3.688_{(1)}$	.034	3,116	4.8/7.1	$7.456_{(1)}$**	.049
Visual – Teasing / Happy slapping								
3.	3,110	4.6/1.9	$16.926_{(1)}$***	.074	3,113	4.3/3.1	$3.078_{(1)}$	.031
6.	3,099	2.3/1.4	$3.338_{(1)}$	.033	3,113	3.1/2.4	$1.374_{(1)}$	.021
10.	3,106	1.4/0.8	$2.247_{(1)}$	.027	3,115	1.3/0.9	$0.935_{(1)}$	.017
15.	3,099	1.1/0.7	$1.346_{(1)}$	.021	3,119	1.4/1.0	$0.863_{(1)}$	.017
Verbal								
5.	3,107	23.9/26.6	$3.085_{(1)}$	.032	3,104	54.4/58.7	$5.959_{(1)}$*	.044
7.	3,107	14.4/11.2	$7.118_{(1)}$**	.048	3,109	14.8/15.1	$0.045_{(1)}$	.004
8.	3,105	13.3/11.2	$3.164_{(1)}$	.032	3,109	18.3/19.7	$0.963_{(1)}$	.018
11.	3,104	31.0/27.4	$4.900_{(1)}$*	.040	3,112	34.7/35.1	$0.066_{(1)}$	.005
17.	3,103	4.9/2.7	$10.332_{(1)}$***	.058	3,114	6.5/7.0	$0.279_{(1)}$	.009
19.	3,098	8.5/6.9	$2.593_{(1)}$	.029	3,114	15.3/19.4	$9.328_{(1)}$**	.055
Online exclusion								
4.	3,100	20.9/22.4	$1.015_{(1)}$	.018	3,113	17.5/16.8	$0.255_{(1)}$	.009
13.	3,108	11.3/4.8	$43.918_{(1)}$***	.119	3,110	12.3/3.9	$72.718_{(1)}$***	.153
16.	3,106	14.0/12.7	$1.104_{(1)}$	.019	3,118	5.8/6.1	$0.145_{(1)}$	.007

%=percentage of students that respond «at least once» (options "Rarely", "Often" or "Always").
M=Man; W=Women.
*$p \le .05$; **$p \le .01$; ***$p \le .001$

4. Discussion and conclusions

The present work started with two objectives: to analyse the prevalence of cyber-aggression and cyber-victimization among adolescents in Asturias and to identify possible gender differences. With regard to the first objective, the trend in results obtained is, as expected, to a large extent consistent with the findings of previous studies in Spain (Buelga & al., 2015; Calvete & al., 2010; Díaz-Aguado & al., 2013; Garaigordobil, 2015). Verbal aggression and online exclusion are more common than visual aggression. However, unlike previous studies, in the present work the prevalence of impersonation is closer to that of visual aggression than that of verbal aggression and exclusion. This may be due to the different indicators used.

The percentage of adolescents who report having exhibited cyber-aggressive behaviours varies from 0.9% who claim at least once to have forced a person to perform a humiliating action, recorded it and then disseminated it to make fun of that person to 29.3% who claim to have insulted a person using text message or instant messaging programs. The percentage of adolescents who report having experienced cyber-victimization varies from 1.1% who claim to have been hit or forced to perform a humiliating action, been recorded and then had the video or picture disseminated to 56.5% who claim to have received prank calls on their mobile phone with no response.

Regarding educational practice, these results show that although the prevalence of most of these behaviours is low, all types of cyber-aggression and cyber-victimization assessed appear to some extent in the analysed sample. It is therefore necessary to devise measures for prevention and treatment, in particular considering that the effects of these behaviours can be very negative (Kowalski & al., 2014). It is important to address and prevent not only the most serious but also those apparently milder instances (verbal cyber-aggression and online exclusion) that are nonetheless the most frequent and may become part of a continued rejection or harassment pattern. Therefore, educating adolescents regarding the ethical and prudent use of communication technologies is essential (Cerezo & al., 2016; Del Rey, Casas, & Ortega, 2012).

With regard to the second objective, the results obtained are in line with expectations and consistent with the most recently published studies (Navarro, 2016). In the present study, there are generally no statistically significant differences between boys and girls. In the few cases in which differences appear, boys are aggressors more frequently than girls, while girls are victims more frequently than boys (these differences are, however, small or very small). The only exception to this trend is that boys report having been victims of false complaints in forums, social networks or online games resulting in their removal from those sites more frequently than girls. A possible explanation for this exception is the significantly greater use that boys make of multiplayer online games compared with girls.

The results obtained lead to several conclusions regarding the interplay between gender and the frequency of use of mobile phones and the Internet as risk factors for cyber-aggression and cyber-victimization in adolescence. Previous studies conclude, as it would be expected intuitively, that the mere use of electronic communication devices constitutes a risk factor (Kowalski & al., 2014). While this is true in general terms, it is notable that in the present

study, while girls make greater use of social networking and instant messaging programs than boys and use the Internet for non-school related tasks for longer periods of time, they do not attack others more frequently than boys via these means. It is also notable that higher usage does not translate into higher probabilities of generalized cyber-victimization via such means. In fact, for two of the three indicators in which girls are more likely to be victims than boys (having received prank calls to their phones without response and having been a victim of false rumours on a social network), the use of these resources in particular did not seem a priori a relevant variable. There are other more powerful risk factors (Álvarez-García, García, & Núñez, 2015; Álvarez-García, Núñez, Dobarro, & Rodríguez, 2015).

Regarding educational practice, the results obtained suggest the importance of taking into account the gender perspective in the prevention of the issue. On the one hand, reproducing the traditional model of masculinity associated with rudeness, insensitivity and aggression should be avoided (Gini & Pozzoli, 2006). In the present study, although differences in prevalence are neither numerous nor large, boys tend to be more aggressive, and girls, victims. Boys also engage in more direct violence (insults, threats), and girls experience indirect violence more frequently (rumours). On the other hand, preventing gender cyber-violence is of paramount importance. In the present study, a greater percentage of boys, compared with girls, acknowledge having disseminated compromising images, involving sexual or suggestive content, without the consent of the victim, and a higher percentage of girls, compared with boys, claim to have been pressured into performing unwanted actions under the threat of having their conversations or intimate images disseminated. In this regard, educating students regarding values, attitudes and skills (respecting the privacy of individuals, being empathetic, etc.) that reduce the possibility of becoming aggressors is important. Teaching basic aspects of cyber-security and avoidance of risky behaviours to students is also essential to reduce the possibility of their becoming victims (Flores, 2014). In recent years, legislative changes have occurred, and various proposals to promote coeducation and to prevent gender-based violence have been published (Edwards & Hinsz, 2014). The present work advocates including the relationship with electronic devices in this training.

For all these reasons, this study constitutes a contribution to the understanding of cyber-aggression and cyber-victimization among adolescents. It adds to the limited number of studies on Spanish samples previously published on prevalence and gender differences, providing updated data and contributing to clarifying certain aspects of the inconsistent evidence available previously. Nevertheless, it has several limitations. First, the data are self-reported, which can generate biased responses due to distortion or social desirability, although minimizing them is attempted by ensuring anonymity and result confidentiality. Second, a large and representative population sample is used, but it is limited to a particular geographical area and specific ages. Any generalization of these results to other populations must be exercised with caution. It would be advisable to replicate this study with other samples in order to analyse the results' external validity.

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