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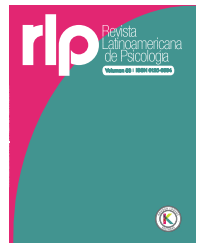

ORIGINAL

Analysis of mental health in cyberbullying victims and perpetrators in Spanish and Colombian adolescents

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Cyberbullying, mental health, adolescent, Spain, Colombia

Abstract **Introduction:** Due to the advance of information and communication technologies, children may be exposed to the phenomenon known as cyberbullying. The abundant literature and existing research confirm the interest that the consequences of cyberbullying can provoke in the mental health of adolescents. The aims of this work were: (1) To compare the figures of the difficulties in mental health and cyberbullying in adolescents from Spain and Colombia, (2) To analyse the relationship between mental health and being a high degree cyber-perpetrator or cyber-victim owing to mobile phones and Internet, in both countries. **Method:** A cross-sectional study was employed, in which 1,080 students from Colombia (11 to 17 years old) and 430 students from Spain (12 to 17 years old) participated through the SDQ, CYBVYC and CYBAGRESS questionnaires. T student, correlations, and the Kruskal Wallis test were used. **Results:** Difficulties in Emotional symptoms, Conduct problems, Hyperactivity, Peer problems, and the Total difficulties scores were higher in Colombia than in Spain. Colombian adolescents scored higher in cyber-victimization *(CYBVYC-Internet)* and cyber-perpetration *(CYBAGRESS)* than Spanish adolescents. However, cyber-victimisation *(CYBVYC-Mobile)* by way of mobile phone was higher in Spain. Moreover, those who had serious victim and serious perpetrator profiles (scores equal to or higher than the 95th percentile in the *CYBAGRESS and CYBVYC* scales) presented higher difficulties in Emotional symptoms, Conduct problems, Hyperactivity, and Peer problems than those who were not classified as pertaining to those profiles, in both countries. A positive and direct correlation between difficulties in mental health, cyber-victimisation, and cyber-perpetration exist, regardless of Internet or mobile phone use. **Conclusions:** Results show how cyberbullying has similar effects on the mental health of Spanish and Colombian teenagers. Finally, there exists a relationship between being a cyberbullying victim or perpetrator and obtaining a higher total score in mental health difficulties among adolescents in both countries.

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Análisis de la salud mental en víctimas y agresores de cyberbullying en adolescentes españoles y colombianos

PALABRAS CLAVE
Ciberacoso, salud mental, adolescente, España, Colombia

Resumen Introducción: Debido al avance de las nuevas tecnologías los menores pueden estar expuestos al fenómeno conocido como *cyberbullying*. La abundante literatura e investigaciones existentes constatan el interés que pueden provocar las consecuencias del *cyberbullying* en la salud mental de los adolescentes. Los objetivos del trabajo fueron: (1) Comparar la puntuación en dificultades en salud mental y *cyberbullying* en adolescentes de España y Colombia, (2) Analizar en ambos países la relación entre salud mental y aquellos perfiles clasificados como nivel severo de *ciberacosador* y *cibervíctima*, a través del móvil o internet. **Método:** Estudio transversal, en el que participaron 1080 estudiantes de Colombia (11 a 17 años) y 430 estudiantes de España (12 a 17 años) a través de los cuestionarios SDQ, CYBVYC y CYBAGRESS. Se utilizaron una T de *student*, correlaciones y la prueba de Kruskal Wallis. **Resultados**: Las puntuaciones en dificultades en Síntomas emocionales, Problemas de conducta, Hiperactividad, Problemas con compañeros y la Puntuación total de dificultades fueron mayores en Colombia que en España. Los adolescentes colombianos obtuvieron mayores puntaciones en *cibervictimización* (*CYBVYC-internet)* y *ciberagresión (CYBAGRESS)* que los adolescentes españoles. Sin embargo, las puntuaciones en *cibervictimización* a través del móvil (*CYBVYC-móvil)* fueron superiores en España. Por otro lado, en términos generales, aquellos adolescentes categorizados como *ciberagresores* o *cibervíctimas* severos (puntuaciones iguales o superiores al percentil 95) obtuvieron mayores puntuaciones en ambos países, en Síntomas emocionales, Problemas de conducta, Hiperactividad y Problemas con compañeros que aquellos que no fueron clasificados bajo esta consideración. Existe correlación positiva y directa entre la salud mental, *cibervictimización* y *ciberagresión*, independientemente de su realización por medio de internet o el teléfono móvil. **Conclusiones:** Existen resultados similares entre el ciberacoso y la salud mental en los adolescentes españoles y colombianos. Finalmente, existe una relación en ambos países entre ser víctima o acosador en ciberacoso y tener mayores dificultades en salud mental para ambos perfiles.

Cyberbullying amongst adolescents is one of the many alarming problems in our current society (Yudes et al., 2020). Access to new technologies, increasingly at an earlier age, has led to the emergence of diverse forms of harassment such as cyberbullying, which includes actions of harassment and aggression against peers by way of information and communication technologies, mainly via the Internet and mobile phones (Garaigordobil, 2011; Tokunaga, 2010).

The incidence of this phenomenon in Europe accounts for alarming symptoms in the adolescent population (León et al., 2012). The recent EU Kids Online report shows a cyber-victimisation frequency of 9% and a cyber-perpetration frequency of 5% (Smahel et al., 2020). Thus, according to data from the Health Behaviour in School-aged Children survey (World Health Organization, 2016) involving more than 40 countries in Europe and North America, Spain occupied the seventh place in the ranking of countries in which 13-year-olds have received threats or insults at least two or three times a month through social media or mobile messaging services. Furthermore, the data obtained in one of the most outstanding investigations on cyberbullying in Spain (Calmaestra et al., 2016), which surveyed 21,487 students across the country, ranging between 12 and 16 years of age, corroborate the incidence of this type of bullying. The results indicated that 6.9% considered themselves to be victims of cyberbullying, while 3.3% acknowledged being responsible for it. Other studies in Spain, show figures between 2% and 30% for cyber-victims, between 1% and 44% for cyber-perpetrators, and from 1% to 46% for cyber-perpetrator/cyber-victims (Zych et al., 2016).

In the case of Colombia, this is a topic abetted by Law 1620, approved by Congress in 2013, which created the national system for coexistence at school and, among other aspects, for the prevention and mitigation of violence at school. This law has led to the emergence of multiple lines of research to reveal the state of violence in secondary schools. Consequently, there are theoretical (Guapacha Díaz, 2014; Rincón-Rueda & Ávila-Díaz, 2014), descriptive and/or exploratory papers (Aranzales et al., 2014; Pinilla Mondragón, 2013; Redondo et al., 2016b; Redondo et al., 2017) that study its incidence on other variables (Blanco-Suarez et al., 2017) or its co-occurrence with bullying (Herrera-López et al., 2017). However, the data currently available in Colombia is limited. Studies show prevalence ranging from 13.6 to 59% (Aranzales et al., 2014; Mura & Diamantini, 2013). A study by Herrera-López et al. (2017) shows a prevalence of 18.7% (10.7% as cyber-victim, 2.5% as cyber-perpetrator and 5.5% as victimised cyber-perpetrator) while Redondo et al. (2016a) found that 27.5% of students had been harassed by means of mobile phones and the Internet at some point. There are previous studies with Spanish and Colombian participants, focused on social competence, motivation, and cyberbullying (Romera et al., 2017) or cyberbullying and problematic internet use (Yudes et al., 2018). However, there is an insufficient amount of studies on cyberbullying with respect to Colombia and Spain (Calmaestra et al., 2020; Yudes et al.,

2018), and even fewer concerning cyberbullying and mental health in those countries. In this regard, we wonder whether similar figures exist between Spain and Colombia regarding cyberbullying and mental health, and, in case of existing differences, whether they are statistically significant.

Within the victim´s profile, we find that associated emotional disorders such as anxiety, stress and depression arise, as well as isolation and social exclusion, and difficulties of integration into a peer group (León et al., 2011), thus causing mental health problems (Landstedt & Persson, 2014; Lereya et al., 2015). It is therefore considered appropriate to evaluate the effect that cyberbullying could have on the mental health of the minors involved, both in victim and perpetrator profiles, with a view towards providing relevant information for developing preventive and intervention programmes (Estévez et al., 2019; Machimbarrena & Garaigordobil, 2018). Previous studies reveal how cybervictims may experience feelings of anxiety, depression, suicidal ideation, low self-esteem, lack of self-confidence, social adjustment issues, and academic difficulties (Gradinger et al., 2009; Hinduja & Patchin, 2010). On the contrary, cyber-perpetrators are more likely to present a lack of empathy, threatening and violent behaviour, delinquent behaviour, social isolation, dependence on technologies and drug consumption (Garaigordobil, 2011; Sourander et al., 2010; Ybarra & Mitchell, 2004). However, there is no research regarding the mental health of those specifically with a high degree of serious cyberbullying victim and serious cyberbullying perpetrator profiles.

On the one hand, all adolescents involved in any of the cyberbullying profiles may be exposed to a greater risk of suffering psychosocial maladjustments and psychopathological disorders during adolescence and in adulthood (Felipe-Castaño et al., 2013; Garaigordobil, 2011). But do those with higher figures in cyberbullying have worse figures in Hyperactivity, Peer problems, Conduct problems, and Emotional symptoms than those with lower figures? In terms of generalisation, does this possible association appear both in Colombia and in Spain or only in one country? On the other hand, adolescence is a developmental stage in which multiple changes occur and can influence the emergence of psychopathological difficulties (Rodríguez & Fernández, 2014). These developmental changes may complicate the assessment of mental health at this stage and make it more difficult to attend psychological or pediatric sessions (Mata et al., 2009). When analysing the mental health of adolescents, it is important to consider the incorporation, in recent decades, of the Internet and new technologies. These new channels of communication have resulted in a primordial change in the way people relate to each other (Rodríguez & Fernández, 2014), affecting the emergence of other types of aggression associated with traditional bullying, such as cyberbullying (Landstedt & Persson, 2014; Tural & Ercan, 2017).

Therefore, it is essential to promote mental health research as a measure for detecting, analysing and preventing possible mental disorders that may appear in children in cyberbullying situations (Fajardo-Bullón et al., 2015). The worldwide incidence of this new form of violence and its relation to mental health problems requires an increase in both local and international studies that could provide keys to continue persevering in prevention and intervention programmes. However, almost all the most frequently cited studies have been conducted in North America and Northern Europe, while other geographical areas, such as Central and Southern America, have been under-researched (Zych et al., 2015). The purpose of this study is to contribute new information originating from South American countries, such as Colombia, and compare it with data from countries with a long tradition in this type of study, such as Spain. For this purpose, we have used the Strength and Difficulties Questionnaire - SDQ (Goodman, 1997), which allows us to determine behaviour and its alterations in children and adolescents (Mata et al., 2009). This is also one of the most widely used instruments for measuring mental health on an international level (Fajardo et al., 2017; Fajardo-Bullón et al., 2012; Fajardo-Bullón et al., 2017; Ortuño-Sierra et al., 2015), providing evidence of validity of use in the international school and clinical context (Ortuño-Sierra et al., 2016). The SDQ is a questionnaire for measuring the mental health of adolescents and is used internationally in numerous studies (Fajardo-Bullón et al., 2017). However, there are no previous papers that analyse cyberbullying and the SDQ scales in Spain and Colombia. There is also no previous research showing Emotional symptoms, Conduct problems, Hyperactivity, and Peer problems specifically in a high degree of cyberbullying (victims and perpetrators) versus a non-high degree of cyberbullying (victims and perpetrators). Taking all of the above into account, our study has the following objectives: (1) To compare the total figures on mental health and cyberbullying, victims and perpetrators, in Spanish and Colombian adolescents. (2) To analyse the relationship between mental health and specifically having or not having a high degree cyber-perpetrator or cyber-victim profile owing to mobile phones and the Internet. It is important to clarify that this second aim does not attempt an international comparison (as the first aim does). This second aim is focused on analysing the relationship between mental health as represented in the 4 scales of the SDQ questionnaire and having or not having a high degree of cyber-perpetrator or cyber-victim profile, and study whether these relationships appear in the same direction in both countries.

Method

The methodology used for this research was an ex post facto, cross-sectional study in which a survey was used as a tool for obtaining empirical evidence (Montero & León, 2007). Probabilistic cluster sampling was used, and the selection of schools and groups was carried out randomly.

Participants

In Spain, the sample consisted of 430 Compulsory Secondary Education (ESO) students from Extremadura, attending 3 public and 2 subsidised high schools from the cities of Badajoz and Mérida. The participants ranged from 12 to 17 years of age, with an average age of 14.21 years (*SD* = 1.34); 51.1% were girls and 48.9% were boys.

In Colombia, the participants were 1,080 students, ranging from 11 to 17 years of age (*M* = 13.48; *SD* = 1.86), enrolled at 5 schools in Bucaramanga and its metropolitan area. 59.5% were girls and 40.5% were boys. The sample selection criteria were to be an adolescent student in the

secondary education centres, selected at random from the centres of the metropolitan areas of Bucaramanga (Colombia) and Extremadura (Spain). Students who did not answer all the items on the SDQ questionnaire were removed from the selected sample in both populations. In this study, all the students answered all the items on the SDQ questionnaire.

Instruments

The Scale of Victimisation via the use of mobile phones and the Internet -CYBVYC (Buelga et al., 2010) designed for minors aged 11 and over, assesses the harassment they have experienced by way of mobile phones (before phones had Internet, as with a smartphone) and Internet (computer or smartphone) over the previous year. The scale of victimisation via the use of mobile phones is used to assess certain behaviours that involve harassment, persecution, denigration, violation of privacy, and social exclusion, and contains eight items. i.e: "They have shared my secrets with others". "Photos or videos of me or my family have been passed and/or manipulated without my permission". This instrument has high internal consistency, as its Cronbach's α is .76 (Buelga et al., 2010). In our data, we obtained a Cronbach's α of .80 for the Spanish population, and a Cronbach's α of .71 for the Colombian population. On the other hand, the scale of victimisation owing to the Internet has the same number of items as the mobile phone victimisation scale, with two additional items associated with identity theft and privacy violations. This scale has a Cronbach's α of .84 (Buelga et al., 2010); therefore, it also displays good internal consistency. On both scales, each item is scored using the following response options: 1 (*never*), 2 (occasionally), 3 (often) and 4 (*always*). In our data, we obtained a Cronbach α of .80 for the Spanish population, and a Cronbach's α of .75 for the Colombian population. This scale was validated in the Spanish population (Buelga et al., 2010; Buelga et al., 2012). However, it was not validated in Colombia. Due to this reason a confirmatory analysis is shown on Table 1.

Table 1. Goodness-of-fit of the proposed model, Victimisation Scale by way of the mobile phone and the Internet in Colombia

Model	2 factors
χ^2	4566.83
$\chi^{2/df}$	33.82
GFI	0.719
IFI	0.378
TLI	0.294
CFI	0.377
RMSR	0.205
RMSEA	0.174

Notes: χ^2 = Chi-square statistic; $\chi^{2/df}$ = Chi-square divided by its degrees of freedom; GFI = Goodness-of-fit index; AGFI = Adjusted goodness-of-fit index; IFI = Incremental fit index; TLI = Tucker-Lewis index; CFI = Comparative fit index; RMSR = Root mean squared residual; RMSEA = Root Mean Squared Error of Approximation.

The Scale of Aggressions by means of Mobile Phones and the Internet - CYBAGRESS (Buelga & Pons, 2012) designed for minors over 11 years of age, measures aggressions carried out by them over the previous year via mobile phones (before phones had internet) and Internet (computer or smartphone) over the previous year. This instrument assesses, by means of 10 items, a series of behaviours related to situations of harassment, persecution, denigration, violation of privacy, social exclusion, and impersonation. For example: "I have insulted or ridiculed someone with messages or calls". "I have told lies and false rumours about someone". Each item is scored as follows: 1 (*never*), 2 (hardly ever), 3 (sometimes), 4 (quite often) and 5 (*very often*). Regarding internal consistency, the Cronbach's α is .88. In our data, we obtained a Cronbach's α of .68 for the Spanish population, and a Cronbach's α of .80 for the Colombian population. This scale was validated in the Spanish population (Buelga et al., 2012). However, it was not validated in Colombia. Due to this reason a confirmatory analysis is shown on Table 2.

Table 2. Goodness-of-fit of the proposed model, Victimisation Scale by way of the mobile phone and the Internet in Colombia

Model	1 factor
χ^2	339.90
$\chi^{2/df}$	9.71
GFI	0.988
IFI	0.885
TLI	0.852
CFI	0.885
RMSR	0.047
RMSEA	0.090

Notes: χ^2 = Chi-square statistic; $\chi^{2/df}$ = Chi-square divided by its degrees of freedom; GFI = Goodness-of-fit index; AGFI = Adjusted goodness-of-fit index; IFI = Incremental fit index; TLI = Tucker-Lewis index; CFI = Comparative fit index; RMSR = Root mean squared residual; RMSEA = Root Mean Squared Error of Approximation.

The Strengths and Difficulties Questionnaire in its self-reported version (SDQ) (Goodman, 1997) assesses various behavioural and emotional problems associated with the mental health of children ranging from 11 to 17 years of age over the previous 6 months. It consists of 25 items that are divided into 5 scales of 5 items each. The first four scales make up the total score for mental health difficulties: Emotional symptoms, Conduct problems, Hyperactivity, and Peer problems. The score of each scale ranges from 0 to 10, and the total difficulty score from 0 to 40 (Fonseca-Pedrero et al., 2011; Rodríguez-Hernández et al., 2012). This questionnaire has already been used in Spain by various authors (Fajardo-Bullón et al., 2012; Ortuño-Sierra et al., 2016), presenting a Cronbach's α of .73 (Goodman, 2001). In our data, we obtained a Cronbach's α of .70 for the Spanish population, and a Cronbach's α of .70 for the Colombian population.

Procedure

The questionnaires were presented during the 2014/2015 school year. Once the schools gave their consent, the questionnaires were completed following the ethical guidelines of the American Psychological Association (American Psychological Association, 2009), which ensures informed consent based on classroom management methods in an educational context. The students responded voluntarily, anonymously and confidentially. Parental consent was previously required. The Ethical Committees of the University of Extremadura (Spain) and the University of Bucaramanga (Colombia) approved this research. The questionnaire was completed in the classroom in the presence of the researcher, who could answer any queries regarding the questionnaire.

Statistical analysis

Throughout the article, descriptive analyses of the sample are carried out according to the five scales of the children's SDQ questionnaire. In order to establish the "abnormal" or "normal" categories, the cut-off points established by the author for the self-reported version were used (Goodman & Goodman, 2011), where 0 to 15 is normal and 16 to 40 is the threshold or abnormal value. Regarding the measurement of cyberbullying profiles, we decided to follow the same criteria as previous research conducted by Yudes et al. (2018) that presents a transcultural comparison among Colombia, Uruguay, and Spain. This previous classification categorised adolescents into 3 profiles, without problems (0 or 1 point), slight cyber-victim/cyber-perpetrator (figures equal to the 85th percentile and lower than the 95th percentile), and serious cyber-victim/cyber-perpetrator (figures equal to or higher than the 95th percentile) (Trull & Prinstein, 2013; Yudes et al., 2018). In accord with Yudes et al. (2018) we focused this study specifically on having or not having a serious cyber-victim/cyber-perpetrator profile (figures equal to or higher than the 95th percentile).

Once the variables were categorised, the normal assumption for the Total Score of Difficulties variable was not met using the Kolmogorov-Smirnov test for the Spanish ($Z = 1.96$; $p < .0011$) and Colombian ($Z = 2.46$; $p < .00$) samples. For this reason, non-parametric Kruskal-Wallis tests were carried out to analyse the differences in the SDQ questionnaire scales according to the variables of being a serious cyber-perpetrator (SPerpetrator), being a serious cyber-victim by way of mobile phones (SVictims-Mobile), or being a serious cyber-victim by way of the Internet (SVictims-Internet), in the Spanish and Colombian samples. The data were analysed using the statistical programme SPSS, version 21.

Results

Comparison of figures in the SDQ, CYBVYC, and CYBAGRESS in Spain and Colombia

Regarding the first aim: "To compare the total figures on mental health and cyberbullying, victims and perpetrators, in Spanish and Colombian adolescents", a comparison of the mean scales and the total difficulty score of the SDQ questionnaire was carried out in Spain and Colombia.

Another interesting analysis undertaken was a global comparison between *CYBVYC and CYBAGRESS* in the two countries, Spain and Colombia. The results showed how figures on cyber-victimising by way of mobile phones ($t = 2.24$; $p < .05$) were higher in Spain ($M = 11.35$; $SD = 3.32$) in comparison with Colombia ($M = 10.96$; $SD = 2.88$). However, figures on cyber-victimising by way of the Internet were significatively lower ($t = -2{,}47$; $p < .05$) in Spain ($M = 12.35$; $SD = 3.11$) in comparison with Colombia ($M = 12.80$; $SD = 3.17$). In the same way, figures on cyber-perpetrators were significatively lower ($t = -2{,}63$; $p < .05$) in Spain ($M = 11.75$; $SD = 2.36$) in comparison with Colombia ($M = 12.23$; $SD = 3.52$). In summary, figures on mental health, cyber-victimisation and cyber-perpetration by way of Internet were higher in Colombia. In contrast, figures for cyber-victimisation by means of mobile phone were higher in Spain.

Analysis of mental health in serious cybervictim and serious perpetrator profiles in Spanish and Colombian adolescents

Once we obtained the comparison between countries, the second aim canvasses analysing the relationship between mental health and having or not having a high degree of perpetrator or victim profile, by way of mobile phones and the Internet. We wanted to focus on two specific profiles: being a serious cyber-victim (SVictims) and being a

Table 3. Descriptive and comparative statistics of the SDQ scales and the total difficulty score of the total samples in Spain and Colombia

SDQ Scales	Spain		Colombia		*T student*
	N	*M (SD)*	*N*	*M (SD)*	
Emotional symptoms	430	2.77 (2.26)	1080	3.55 (2.47)	$t = -5.58$*
Conduct problems	430	2.05 (1.62)	1080	4.60 (1.63)	$t = -11.15$*
Hyperactivity	430	4.13 (2.49)	1080	4.99 (1.75)	$t = -7.66$*
Peer problems	430	1.58 (1.55)	1080	4.60 (1.63)	$t = -32.70$*
Total difficulties score	430	10.44 (5.28)	1080	16.26(5.15)	$t = -19{,}31$*

Note: The total difficulty score is the sum of the SDQ questionnaire scales, except for the prosocial behaviour scale. *SD*: standard deviation.
*$p < .01$

serious perpetrator (SPerpetrator) or not (figures equal to or higher than the 95th percentile or not; see the Statistical analysis section). In Spain, regarding the descriptive analyses and percentiles, for the "serious victims by way of mobile phones" variable *M* = 11.35, *SD* = 3.32, 95th percentile = 17. For the "serious victims by way of the Internet" variable *M* = 12.36, *SD* = 3.11, 95th percentile = 19, and for the "serious cyber-perpetrator" variable *M* = 11.75, *SD* = 2.36, 95th percentile = 16. Thus, the percentages for each of the profiles studied were as follows: 7.7% were considered "serious victims by way of mobile phones", 5.4% "serious victims by way of the Internet", and 6.1% "serious cyber-perpetrators".

In Colombia, with regard to the descriptive analyses and percentiles, for the "serious victims by way of mobile phones" variable *M* = 10.97, *SD* = 2.83, 95th percentile = 17, for the "serious victims through the Internet" variable *M* = 12.81, *SD*= 3.16, 95th percentile = 19, and for the "serious cyber perpetrators" variable *M* = 12.24, *SD* = 3.49, 95th percentile = 16. Thus, the percentages for each of the profiles studied were as follows: 4.9% were considered "serious victims by way of mobile phones", 6.8% "serious victims by way of the Internet", and 9.6% "serious cyber-perpetrators".

Non-parametric Kruskal-Wallis tests were used on Table 4.

Table 4. Scores on SDQ scales and total difficulties of mental health in relation with being or not being SPerpetrators and SVictims in Spain and Colombia

			Spain				Colombia	
Measures	***N***	**Mean range**	χ^2	***p***	***N***	**Mean range**	χ^2	***P***
Emotional symptoms								
SVictims[a]-Mobile	32	343.34	39.84	<.001**	51	682.78	16.55	<.001**
Non-SVictims-Mobile	393	202.39			984	509.46		
SVictims[b]-Internet	22	339.68	25.23	<.001**	70	689.48	25.09	<.001**
Non-SVictims-Internet	403	206.08			965	505.56		
SPerpetrator[c]	25	261.84	4.40	.036*	99	584.89	5.57	.018*
Non-SPerpetrator	399	209.41			936	510.93		
Conduct problems								
SVictims-Mobile	33	277.76	10.82	.001**	51	743.32	31.36	<.001**
Non-SVictims Mobile	390	206.44			984	506.32		
SVictims-Internet	23	270.91	5.90	.015*	70	712.91	32.84	<.001**
Non SVictims-Internet	400	208.61			965	503.86		
SPerpetrator	26	297.12	14.26	<.001**	99	702.40	42.86	<.001**
Non SPerpetrator	396	205.88			936	498.50		
Hyperactivity								
SVictims-Mobile	33	270.65	8.17	.004**	51	628.25	7.44	.006**
Non-SVictims Mobile	391	207.59			984	512.29		
SVictims-Internet	23	240.02	1.24	.265	70	631.72	11.08	.001**
Non-SVictims Internet	401	210.92			965	509.75		
SPerpetrator	26	275.44	7.57	.006**	99	662.72	26.16	<.001**
Non-SPerpetrator	397	207.85			936	502.69		
Peer problems								
SVictims-Mobile	32	313.95	26.01	<.001**	51	644.26	9.82	.002**
Non-SVictims Mobile	390	203.09			984	511.46		
SVictims-Internet	23	311.15	17.29	<.001**	70	673.26	20.78	<.001**
Non-SVictims Internet	399	205.76			965	506.74		
SPerpetrator	26	233.63	1.02	.312	99	580.92	4.98	.026*
Non-SPerpetrator	395	209.51			936	511.35		
Total difficulties score								
SVictims-Mobile	31	331.44	38.03	<.001**	51	739.99	29.66	<.001**
Non-SVictims Mobile	379	195.20			984	506.49		
SVictims-Internet	22	312.86	19.16	<.001**	70	757.30	48.24	<.001**
Non-SVictims Internet	388	199.41			965	500.64		
SPerpetrator	25	283.78	11.88	.001**	99	690.43	36.52	<.001**
Non-SPerpetrator	384	199.87			936	499.76		

Note: *p < .05; **p < .01; *df* = 1. SVictims-Mobile[a] = Serious victim by way of Mobile phone (equal to or higher than the 95th percentile on the CYBVYC-Mobile scale) SVictims-Internet[b] = Serious victim by way of the Internet (equal to or higher than the 95th percentile on the CYBVYC-Internet scale); SPerpetrator[c] = Serious perpetrator (equal to or higher than the 95th percentile on the *CYBAGRESS* scale)

In Colombia, SVictim or SPerpetrator profiles obtained higher scores (difficulties in mental health), than those of not being SVictims or SPerpetrators, on all the SDQ scales and on the total score SDQ scale. In Spain, there were the same results as in Colombia on all the scales except on two: for the SPerpetrators there were no significant differences in the Problems with peers scale, and there were no significant differences in the Hyperactivity scale regarding the differences between being or not being SVictims-Internet. However, these differences were on all the SDQ scales in Colombia.

Analysis of the correlation between the total scores on the SDQ, CYBYC, and CYBAGRESS in Spain and Colombia

Table 5 presents a Spearman's Rho correlation analysis showing the correlation results of the SDQ total difficulty score and the total scores obtained in the CYBYC and CYBAGRESS scales. In this case, in contrast with section 3.2, participants were not classified by profiles. We used continuous scores in the scales. Positive and significant relationships were found between all the variables studied, in Spain and in Colombia. The results obtained provided a positive and significant relationship between the total score of difficulties and the total scores of victims by way of mobile phones (Spain r_s = .442, p < .01; Colombia r_s = .383, p < .01), Internet (Spain r_s = .348, p < 0.01; Colombia r_s = .376, p < .01) and perpetrators (Spain r_s = .359, p < .01; Colombia r_s = .336, p < .01). Another important piece of information, both in Spain and in Colombia, is the relationship between the total score of victims by way of the Internet and the total score of victims by way of mobile phones. Finally, it is worth highlighting that, when carrying out the Pearson correlation, very similar scores were obtained to those obtained with the Spearman Rho correlation.

Discussion and conclusions

According to the results, the four scales of the SDQ show higher difficulties regarding mental health in Colombian adolescents than in Spanish ones. As Romera et al. (2017) suggested, the violence and insecurity that Colombian society has experienced during the last six decades (guerrilla, drug trafficking, urban violence, etc.) has influenced family environments and socialisation styles (Romera et al., 2017), affecting also the mental health difficulties of adolescents. In Spain, adolescents obtained lower means of perpetration and victimisation by way of the Internet than their Colombian peers. However, Spanish adolescents obtained higher scores on victimisation by way of mobile phone than their counterparts in Colombia. Probably the lower accessibility of the mobile phone in Colombia (in our sample 24.1% did not have access) is a relevant variable to consider explaining the results of lower figures in Colombia when cyberbullying is perpetrated by way of the mobile phone. The study of Englander (2019) showed that mobile phone ownership significantly increased the risk of becoming a cyberbully and a cyberbully/victim (Englander, 2019). It is a relevant variable for Colombia to prevent a future increase of cyberbullying by way of mobile phones.

Moreover, the results show that adolescents who were classified as serious cyber-perpetrator and serious cyber-victim profiles will have higher scores and difficulties in Emotional symptoms, Conduct problems, Hyperactivity, Peer problems, and in the Total difficulties score than those who were not thusly classified. These results agree with other studies which indicate how adolescents who appertain to any cyberbullying profile are exposed to a greater risk of suffering psychosocial mismatches and psychopathological disorders in their adolescence and adulthood (Garaigordobil, 2011; García-Maldonado et al., 2012; Lereya et al., 2015). Predictions can even be established between having suffered harassment in early stages and suffering internalising symptoms in later stages (Zwierzynska et al., 2013). In addition, in traditional bullying, it had already been found that participants involved in bullying at school had more psychopathological symptoms than those who were not involved (Felipe-Castaño et al., 2013; Wang et al., 2011). The present study shows that these effects also appear in cyberbullying. With respect to the Colombian sample, those students classified as serious cyber-victims and serious cyber-perpetrators, obtained higher scores for all the scales of the SDQ (Emotional symptoms, Conduct problems Hyperactivity, Peer problems) than those who were not classified in those profiles. In the same manner as in Spain except for the Hyperactivity scale (no differences for the serious victims-Internet) and the Problems with peer scale (no differences for the serious perpetrator). Our results confirm that this relationship occurs in Spain and Colombia and that it has not changed in relation to previous studies from 2010 (Sourander et al., 2010) and 2013 (Kowalski & Limber, 2013) where the victim and perpetrator profiles had the most negative mental health scores. Similar results were found in the study conducted by Sourander et al. (2010). However,

Table 5. Spearman's Rho correlation analysis between the total difficulties score for victims by way of mobile phones, victims by way of the Internet and perpetrators in Spain and Colombia

	Spain				Colombia			
Measures	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1.Total difficulties	-				-			
2.Perpetrators	.359**	-			.336**	-		
3.Victims-Mobile phones	.442**	.518**	-		.383**	.521**	-	
4.Victims-Internet	.348**	.483**	.773**	-	.376**	.517**	.777**	-

Note: ** p < .01.

our results add other difficulties in mental health, when the perpetrators and victims are in the high degree percentile of cyber-victim or cyber-perpetrator (serious victims/perpetrators; >95th percentile).

Sourander et al. (2010) showed how cyber-victims were related to perceived difficulties in emotional and group problems. Our results show how when the adolescents are serious victims, we must add Hyperactivity and Conduct problems to the difficulties already described by Sourander et al. (2010). In the case of Spain, when cyberbullying happens by way of the Internet instead of by way of mobile phones, differences in Hyperactivity, between being a serious or not serious victim disappear. Some studies demonstrated that the use of the mobile phone can be associated with Hyperactivity in adolescents (Ra et al., 2018). Maybe the use of the mobile phone increases when adolescents are serious victims and could cause at the same time a higher score in Hyperactivity (Panagiotidi & Overton, 2020). More future studies are needed on this issue.

At the same time, Sourander et al. (2010) showed how cyber perpetrators were related to perceived difficulties in Hyperactivity and Conduct problems. Our results show how when the adolescents are serious cyber-perpetrators, we must add Emotional difficulties (in Spain) and Emotional difficulties and Peer problems (in Colombia) to the difficulties already described by Sourander et al. (2010). It is interesting to highlight how, in the Spanish sample, the serious perpetrators do not perceive problems with their peers, even though they are the main parties responsible for aggressions or causing violent acts. According to other studies, individualism is positively associated to cyber-perpetration whereas collectivism is negatively associated with aggressive behaviours in cyberbullying (Barlett et al., 2014; Strohmeier et al., 2013; Wright, et al., 2021). Our results agree with the study of Romera et al. (2017) which indicates that the perception of peers is fundamental for understanding the phenomenon in Spain. In this sense, the Spanish culture is characterised by enhancing more individualistic values such as recognition and social image and acceptance within the group, common in a more competitive European culture (Romera et al., 2017). However, this does not happen in the Colombian sample where, coinciding with Campbell et al. (2013), cyber-perpetrators got higher scores in relationship problems with peers. These results diverge from the Spanish sample where it appears that cyber-perpetrators enjoy greater social acceptance than in the Colombian sample. It could be dangerously accepted as a normal behaviour in the student's lives. This suggests that the pursuit of popularity can lead some adolescents, in certain peer groups, to act contrary to socially established norms (Romera et al., 2017). Concurring with Romera et al. (2017) it is necessary to analyse in greater depth the relationship between popularity, cyber-aggression, and normative adjustment in Spain.

On the other hand, this study confirms the existence of a positive and significant correlation between mental health difficulties and being harassed or victimised via mobile phones and the Internet. These results are consistent with what was presented in the review of the scientific literature carried out by Garaigordobil (2011). Furthermore, the results of other studies conclude that cyberbullying can be linked to low self-esteem, suicidal ideation, anger, and frustration (Brighi et al., 2012; Hinduja & Patchin, 2010; Kowalski & Limber, 2013; Wang et al., 2011). Thus, students who participate in the cyberbullying phenomenon are more likely to present depressive symptoms as well as behaviour and social adjustment issues (Ybarra & Mitchell, 2004; Wang et al., 2011), which may lead to psychiatric and psychosomatic problems (Sourander et al., 2010).

Consequently, in the present study, we found positive and significant correlations between victimisation scores (either by way of mobile phones or the Internet) and cyberbullying perpetrators. In other words, victimisation scores increase along with perpetration scores, both of which may be related: the higher the victimisation score, the greater the likelihood of also becoming a perpetrator. According to Buelga et al. (2012), this particular cyberbullying situation could be explained, unlike traditional harassment, by the physical separation between the victim and the perpetrator through technology. This distance allows adolescent victims to harass others in retaliation or even as a form of self-defense. This fact can occur in online situations, which are specific to cyberbullying, but it does not seem to occur in traditional bullying, where the victim does not usually act aggressively (Calvete et al., 2010).

To sum up, this study reaches three main conclusions: (a) Difficulties in Emotional symptoms, Conduct problems, Hyperactivity, Peer problems, and the Total difficulties scores are higher in Colombia than in Spain. Moreover, Colombian adolescents have higher scores in cyber-victimisation *(CYBVYC-Internet)* and cyber-perpetration *(CYBAGRESS)* than Spanish adolescents. However, cyber-victimisation *(CYBVYC-Mobile)* by way of the mobile phone was higher in Spain, probably related to the higher proportion of adolescent owners of mobile phones. (b) Those who had serious cyber-victim and serious cyber-perpetrator profiles (scores equal to or higher than the 95th percentile in the *CYBAGRESS and CYBVYC* scales) had higher difficulties in mental health than those who did not have those profiles. There were no differences between Spain and Colombia, showing the same direction of the studied variables. These results, in turn, show how cyberbullying has similar effects on adolescents, not only among European teenagers (Athanasiou et al., 2018), but also among Colombian youth. Only two exceptions were found in Spain: first, there were no differences between being or not being a serious cyber-perpetrator in relation to Problems with peers; probably due to the pursuit of popularity and the existence of a more individualistic culture in Spain. Secondly, the higher scores in Hyperactivity, between a serious and a not serious cyber-victim, only appear via the use of the mobile phone, but not by way of the Internet. This is probably due to the problematic use of mobiles in victims when they suffer cyberbullying. (c) Finally, a positive and direct correlation between difficulties in mental health, cyber-victimisation, and cyber-perpetration exists, regardless of Internet or mobile phone use. Future research could exclusively use the *CYBVYC* Internet scale and avoid differences between cyberbullying owing to the Internet and the mobile phone, but it could be undertaken only when the total of the target population could have access to the mobile phone.

Some limitations of the present study are due to the difficulty in generalising the results obtained for students of educational levels other than those in the 11 to 17-age

range. Furthermore, when using self-reporting tools, there may be a social desirability bias in which one does not want to be identified as a victim or perpetrator. Therefore, victimisation and perpetration scores could be higher than those actually obtained. The scale of victimisation was exactly the same as for the Spanish population. Maybe this could explain the low alpha. Future research could include the mixed profiles of victims/perpetrators and bystanders.

As future lines of research, we recommend more international studies involving a large group of European and South American countries. It would be interesting to analyse the use of aggression in the virtual environment in greater depth and whether it is socially accepted when it is considered an act of defence. Finally, as there are similarities in the scores of adolescents, some Spanish cyberbullying prevention programmes could be implemented in Colombia with the expectation of similar results (Garaigordobil, 2011).

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Conflicts of Interest

The authors declare no conflict of interest.

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