

RESEARCH ARTICLE

Prevalence and psychosocial predictors of cyberaggression and cybervictimization in adolescents: A Spain-Ecuador transcultural study on cyberbullying

Antonio J. Rodríguez-Hidalgo¹, Oswaldo Mero^{2‡}, Eva Solera^{3‡}, Mauricio Herrera-López⁴, Juan Calmaestra¹*

1 Department of Psychology, Universidad de Córdoba, Córdoba, Spain, **2** Management, Development and Executive Secretariat Faculty, University Laica Eloy Alfaro, Manabí, Ecuador, **3** International University of La Rioja, Logroño, Spain, **4** Department of Psychology, University of Nariño, San Juan de Pasto, Colombia

☯ These authors contributed equally to this work.

‡ These authors also contributed equally to this work.

* juan.calmaestra@uco.es



OPEN ACCESS

Citation: Rodríguez-Hidalgo AJ, Mero O, Solera E, Herrera-López M, Calmaestra J (2020) Prevalence and psychosocial predictors of cyberaggression and cybervictimization in adolescents: A Spain-Ecuador transcultural study on cyberbullying. PLoS ONE 15(11): e0241288. <https://doi.org/10.1371/journal.pone.0241288>

Editor: Thomas M. Olino, Temple University, UNITED STATES

Received: March 31, 2020

Accepted: October 12, 2020

Published: November 11, 2020

Copyright: © 2020 Rodríguez-Hidalgo et al. This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability Statement: All relevant data are within the paper.

Funding: This work was supported by Save the Children® under the project Bullying, Cyberbullying and Associated Factors (contract with the Foundation of the Autonomous University of Madrid; Code: 056900) To J. Calmaestra; the I+D+i, Ministerio de Industria, Economía y Competitividad, Spain, Grant: project PSI2016-74871-R (www.mineco.gob.es) to E. Romera; and

Abstract

The present study aims to collect data about the prevalence of cyberbullying and the role of self-esteem, empathy, and social skills in predicting cybervictimization and cyberaggression in two different countries: Spain and Ecuador. Additionally, it compares the similarities found in both countries. A wide sample of adolescents from Secondary Education ($N = 24943$; mean age = 13.92; $SD = 1.30$, girls = 49.9%) from both countries (Spain = 14,206 and Ecuador = 10,737) took part by filling in a set of self-reports. Weighted analyses and structural equation models were used. The results revealed that 8.8% were cybervictims, 3.1% were cyberaggressors and 4.9% cybervictims-cyberaggressors in Spain; whereas 8.7% were cybervictims, 5.1% were cyberaggressors and 14.3% were cybervictims-cyberaggressors in Ecuador. Cybervictimization could be predicted in both countries by means of self-deprecation and social skills, although the meaning of some skills was different depending on the country. Cyberaggression could be predicted in both countries by means of empathy, assertiveness, and conflict-resolution skills, as well as by communicative and relational skills. Self-deprecation was a predictor of cyberaggression only in Spain. These results are discussed, and educational inferences are drawn for prevention.

Introduction

Adolescents spend most of their time in high school, where they are involved in social activities with their classmates and teachers [1]. In recent years, this social dynamic has been extended and redefined by means of the use of digital relationships. More and more adolescents interact in the cyberspace, exceeding the relational limits that physical space has regarding time, space and the number of people connected [2]. Adolescents' accessibility to internet via mobile devices, technological advances and the rise of cyber-relationships contribute to the increased

Cátedra de Cooperación al Desarrollo Project 2020 in agreement Ayuntamiento de Córdoba-Universidad de Córdoba, Spain. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing interests: The authors have declared that no competing interests exist

risk of being involved in cyberbullying [3, 4]. The scientific literature on the psychosocial factors related to this phenomenon is increasing. Nevertheless, three out of four of the studies on cyberbullying have been carried out in European countries or the USA [5]. This phenomenon has hardly been studied in countries of other more disadvantaged regions, such as the South American countries [6–8]. However, there is a small number of cross-cultural studies. Therefore, there is a need to deepen this line, through cross-cultural studies between countries of North America and Europe with countries in South America, which can contribute to: a) identify stable psychosocial factors in various contexts; and b) know the psychosocial factors that have a unique behavior in different countries. This would make possible to expand the evidence-based knowledge to design more effective prevention strategies and/or programs at a global level, and to contemplate specific strategies and actions adapted to the peculiarities of each cultural context. Additionally, this knowledge could make prevention programs more effective.

Cyberbullying

Cyberbullying is an interpersonal, aggressive, repeated behavior whose purpose is harming a victim by means of information and communication technologies [9–13]. The cyberaggression that causes cybervictimization -the two dimensions of cyberbullying- is developed by means of cyberspace and other telematic channels, so it can be produced and reproduced in any place and at any time [7]. For cyberbullying to happen, it takes at least two people. The cybervictim who receives the cyberaggression, and therefore is cybervictimized, and the cyberaggressor who commits it.

Cyberbullying is associated with some psychological, social, educational, health and family problems that extend to those involved in the phenomena [3, 14–18]. However, at a greater extent, cybervictims may suffer discrimination among peers, depression, aggressiveness, anxiety, fear, somatic disorders, deterioration of self-esteem, academic problems, substance use, and suicidal attempts and ideation [15, 17, 19, 20].

Being a cybervictim increases the risk of becoming a cyberaggressor [21, 22]. Some studies have shown that becoming a cybervictim or cyberaggressor are not separate processes, but they even share quite a few risk factors [23]. Sometimes, there are people who are victims and aggressors at the same time, the so-called aggressor/victim in traditional bullying [24] and cyberbully/cybervictim in cyberbullying situations. High levels of antisocial behavior seem to be related to high levels of involvement as a cybervictim, cyberaggressor and cyberbullying observer [19, 25]. To prevent adolescents' involvement in this phenomenon, and the possible vicious circle between cybervictimization and cyberaggression, it is necessary to study its prevalence and the potential associated factors.

Studies on cyberbullying carried out in European and North American countries have contributed to generating knowledge for its prevention in these places. In these regions, studies about the prevalence of cyberbullying, regarding the different involvement roles, offer disparate data. This is partially due to the fact that the instruments of measurement used in the studies are different in many cases. For example, in the USA, Lee et al. [26] indicated that, considering a wide sample of adolescents, they observed that 13.6% were directly involved in cyberbullying: 5.1% were cybervictims; 3.9% were cyberaggressors and 4.6% were cybervictims-cyberaggressors. A systematic review of studies conducted in the USA with different measurement instruments shows that: between 1% and 41% are cyberbullies; between 3% and 72% are cybervictims; and between 2.3% and 16.7% are cyberbullying victims [27]. In Spain, specifically in Andalusia, it was observed that 31.2% of adolescents admitted being directly involved in bullying: 9.3% as cybervictims, 5.5% as cyberaggressors and 3.4% as cybervictims-

cyberaggressors [28]. Also, in Spain, Larrañaga, Yubero, Ovejero, & Navarro's study [29] on adolescents showed that 26.6% were cybervictims, of whom 22% had become cybervictims promptly and 6.6% were serious cybervictims, without differences regarding sex. In recent years, the number of studies carried out on adolescents from Latin America has increased; but most of them are not published in impact journals [30]. There are countries where very few studies with scientific rigor and large samples have been carried out, as is the case of Ecuador. In this country, Pieschl, Kuhlmann, & Porsch [31] observed that 55% adolescents recognized themselves as cybervictims while 52% were cyberaggressors. This study shows that the levels of cyberbullying in Ecuador are higher than in Spain but, as pointed out in other works, the dynamics of the phenomenon is similar [32].

Recently, transnational studies are being carried out between European countries and Latin American countries. For example, Spain-Colombia transnational study on adolescents carried out by Herrera-López, Casas, Romera, Ortega-Ruiz, & Del Rey [33] showed that in Spain (Andalusia), 9.3% were cybervictims, 5.3% were cyberaggressors and 6.4% were cybervictims-cyberaggressors; whereas in Colombia, 10.7% were cybervictims, 2.5% were cyberaggressors and 5.5% were cybervictims-cyberaggressors [34]. This emerging line of transnational studies between favored and disadvantaged regions, by using similar instruments and methodology, could provide knowledge of great strategic value for the prevention of cyberbullying. In view of the scarce scientific literature on cyberbullying in Ecuador, the comparative study of this phenomenon with a European country with which it has strong historical-cultural ties, such as Spain, could be of great interest.

The study of individual factors related to cyberbullying has provided elements for the understanding of this phenomenon [35]. It seems especially relevant to continue deepening the study of individual factors related to the psychosocial life of adolescents. The immediate psychosocial dynamics, or immediate context, can be an aggravating factor and provide clues to understand cyberbullying [36, 37]. For these reasons, it is relevant to review the role of self-esteem, empathy, and social skills in relation to cyberbullying.

Cyberbullying and self-esteem

Self-esteem is a feeling towards oneself depending on its characteristics and can be positive or negative [38]. In the last years, the number of studies based on the relation between cybervictimization and self-esteem in adolescents has increased [39–42]. Additionally, it has been observed that cybervictimization has a negative connection with self-esteem [39, 40, 43]. Cybervictims show lower levels of self-esteem, sense of belonging to school and commitment with it [42], fact that is more accentuated in girls than in boys [17]. Some studies have revealed that low self-esteem is a predictor of cybervictimization [40, 44, 45] and emphasized the fact that high self-esteem is a protective factor for cybervictimization.

In their studies, Bayraktar et al. [43] and Garaigordobil [46] suggested a negative correlation between cyberaggression and self-esteem; however, in the first study, it was shown that those who showed a lower self-esteem tended to be cyberaggressors/cybervictims while the second study indicated that they were pure cyberaggressors. On the other hand, Bergmann & Baier's study [21] slightly relates high self-esteem to a greater risk of cyberaggression: the prevalence of cyberaggression was correlated to being a girl, having high self-esteem, low empathy, low marks at school or being a bully in the school, among other issues. Additionally, some studies have revealed that a low level of self-esteem predicts cyberaggression [44, 45].

To summarize, most studies indicate that self-esteem is negatively correlated with cybervictimization. A considerable section of the studies also coincides in pointing out that self-esteem is negatively correlated with cyberaggression.

Cyberbullying and empathy

Empathy could be defined as the personal ability to register and be in solidarity with others' feelings [47, 48]. The levels of an aid behavior towards the others are positively associated with the levels of affective empathy [49]. Cognitive empathy is positively associated with aid behaviors towards cybervictims [50]. Nevertheless, low levels of empathy and moral connection are associated with higher levels of cyberaggression [21, 46]. Both cognitive and affective empathy are negatively associated with cyberaggression [51–54]. For some studies, the strongest association occurs with affective empathy [51] and for others, with cognitive empathy [52]. The systematic review and meta-analysis on 25 studies by Zych, Baldry, Farrington, and Llorent [55] conclude that high levels of cyberaggression are related to low levels of empathy; and that cybervictims usually present higher levels of affective empathy.

Hence, it was observed that empathy helps to predict cyberaggression and cybervictimization [44]. Affective and cognitive empathy predict cyberaggression regardless sex, age, and nationality [52]. However, a short-term longitudinal study with a sample of less than half a thousand of Greek adolescents concluded that neither empathy nor sex were predictors of cyberaggression or cybervictimization [56]. On the other hand, in young adolescents, it has been observed that neither affective empathy nor cognitive empathy were predictors of cyberaggression [57].

The literature points out that empathy is positively related to cybervictimization. However, the reviewed works suggest that empathy is negatively related to cyberaggression.

Cyberbullying and social skills

Social skills are cognitive routines or behaviors that allow to establish or maintain positive relationships with others [58, 59]. The review of the scientific literature shows that the educational prevention of cyberbullying in adolescents at a global level has as one of its main lines of actions the promotion and improvement of social skills [60–63]. In the last years, the study of relations between social skills and the involvement in cyberbullying has increased [7, 64]. More and more studies support the association of interpersonal difficulties with the victimization of cybernetics bullying during adolescence [65].

In the USA and Australia, Hemphill & Heerde [66] carried out a study where they concluded that presenting deficient social skills and a low social competence were associated with being a cybervictim. Furthermore, Navarro Yubero, Larrañaga, & Martínez [67] carried out a study with a small sample of Spanish adolescents where they observed that social anxiety, communicative difficulties with peers and the lack of social skills were predictors of cybervictimization. In a study also carried out in Spain with a wider sample of adolescents [7], it was observed that communicative social or relational skills, conflict-resolution skills and assertiveness did not show a predictive power of cybervictimization in none of the ethnic-cultural groups controlled by country of birth (Spain, Morocco, Romania, Colombia and Ecuador). Nevertheless, some social skills showed a predictive ability on cyberaggression for some ethnic-cultural groups: low assertiveness was a predictor of cyberaggression in those who were born in Spain; and communicative skills acted as a positive predictor of cyberaggression for those who came from Colombia and Spain. Garaigordobil pointed out that, in Spain, adolescents involved in cyberbullying used aggressive behavior more as conflict resolution techniques than those not involved [25].

Studies show that social skills appear to be related to cybervictimization as well as cyberaggression. However, regarding the meaning of these relationships—whether they are positive or negative—there are no conclusive results.

The present study

According to the scientific literature, cyberbullying has a different prevalence across different regions and countries. In general, it has been observed that this phenomenon is usually related to self-esteem, empathy, and social skills. To prevent cyberbullying, it is necessary to know more about the prevalence of this phenomenon and the predictors of cyberaggression and cybervictimization on wide significant samples from different cultural contexts by means of instruments approved and validated internationally [7]. In the same line, it is important to examine how generalizable the phenomenon is in different context. The literature review shows that the emerging line of transnational studies between European and Latin American countries, although it is incipient, is beginning to offer significant contributions to alleviate cyberbullying in disadvantaged countries. There are very few comparative studies between Spain and Ecuador in this regard. For this reason, this transnational study focuses on these two countries. However, the study, based on the results obtained, has provided: a) general proposals for the prevention of cyberbullying; and b) country-specific prevention proposals, which can increase their effectiveness in each context [32]. For this reason, a transnational study has been developed with school-going adolescents in Spain and Ecuador regarding the following objectives:

- a. To study the prevalence of cyberbullying in adolescents considering the involvement roles in Spain and Ecuador.
- b. To know the predictive capacity of some psychosocial variables—self-esteem, empathy, and social skills—on cyberaggression and cybervictimization.
- c. To compare the predictors of cyberaggression and cybervictimization in adolescents from Spain and Ecuador.

The following hypotheses have been studied:

1. Self-esteem will be negatively associated with cybervictimization and cyberaggression.
2. Empathy will be positively associated with cybervictimization and negatively associated with cyberaggression.
3. Social skills will be associated with cybervictimization and cyberaggression.

Materials and methods

Participants

In total, 33,303 subjects filled in the data collection instruments. Nevertheless, 8,360 participants did not actually fill in any item of the instruments. That is why, the total sample for this study is formed by 24,943 students whose ages ranged from 11 to 18 (mean age = 13.92; SD = 1.30), of whom 49.9% were girls. The sample was collected in two countries: Spain ($n = 14206$; mean age_{Spain} = 14.03; SD = 1.39; girls = 50.7%) and Ecuador ($n = 10737$; mean age_{Ecuador} = 13.77; SD = 1.17; girls = 48.9%). The Spanish sample was collected by means of a conglomerate random sampling in the national territory, while the Ecuadorian sample was obtained following the same methodology but only in the geographic region 4 of Ecuador that consists of the wide provinces of Manabí and Santo Domingo de Los Tsáchilas.

Instruments

We used a set of self-reports formed by 4 different questionnaires. Some questions regarding socio-demographic data were included in the set.

In order to measure cyberbullying, the Spanish version of the *European Cyberbullying Intervention Project Questionnaire*—ECIP-Q—was used [68]. The questionnaire was composed of two dimensions: cybervictimization and cyberaggression. It includes a total of 22 items—11 items per dimension—and it is answered by means of a 5-point Likert-type scale (0 = never; 1 = Yes, once or twice; 2 = Yes, once or twice a month; 3 = Yes, once a week; 4 = Yes, more than once a week). A sample item from the cybervictimization dimension is “*Someone said nasty things to me or called me names using texts or online messages*” and from the cyberaggression dimension is “*I spread rumors about someone on the Internet*”. The reliability values for this study are optimal ($\alpha_{\text{cybervictimization}} = 0.896$; $\alpha_{\text{cyberaggression}} = 0.918$). The factorial structure is validated with samples from Spain and Colombia that showed good results [33, 68]. Additionally, optimal values are also obtained in its factorial structure [69]: Satorra Bentler $\chi^2_{\text{S-B}} = 20278.528$, $p < 0.001$, NNFI = 0.982, CFI = 0.981, IFI = 0.983, RMSEA = 0.062 (90% CI: 0.061–0.063). In order to establish the different involvement roles—not involved; cybervictim, cyberaggressor and cybervictim-cyberaggressor—the correction of the instrument proposed by the authors was used [11]. Cybervictims scores equal or higher than 2 (*Yes, once or twice a month*) in any of the items of cybervictimization and scores equal or lower than 1 (*Yes, once or twice*) in all the items of cyberaggression. Cyberaggressors scores equal or higher than 2 (*Yes, once or twice a month*) in any of the items of cyberaggression and scores equal or lower than 1 (*Yes, once or twice*) in all the items of cybervictimization. Cybervictim-cyberaggressor scores in any of the items of both cyberaggression and cybervictimization with a score equal or higher than 2 (*Yes, once or twice a month*).

Moreover, the Rosenberg Self-Esteem Scale—RSES—questionnaire was used to measure self-esteem [38]; this questionnaire was adapted and validated by Martín-Albo, Núñez, Navarro and Grijalvo [70] and Viejo [71]. This instrument can be used as one-factor instrument with a general value for self-esteem; or as a two-factor instrument, with two dimensions: self-confidence (five items positively formulated) and self-deprecation (five items negatively formulated). An example of an item for self-confidence is “*On the whole, I am satisfied with myself*” while “*I feel I do not have much to be proud of*” is an example of a self-deprecation item. The two-dimension model matched with the data collected for this research. The values of the scale of measurement range from 1 to 4. The reliability analyses have shown quite a few indexes ($\alpha_{\text{self-confidence}} = 0.776$; $\alpha_{\text{self-deprecation}} = 0.757$). The CFA showed optimal levels of the instrument ($\chi^2_{\text{S-B}} = 2385.949$, $p < 0.001$; CFI = 0.981; NNFI = 0.972; RMSEA = 0.053 [90% CI: 0.051–0.054]).

The Basic Empathy Scale—BES—[48] was used in a version adapted by Oliva et al. [59] to measure the levels of empathy. The scale is composed of 9 items (e.g. “*After being with a friend who is sad about something, I usually feel sad*”). The one-factor model that was used for this study shows optimal reliability values ($\alpha_{\text{empathy}} = 0.914$). The CFA showed optimal levels for the factor structure of the instrument ($\chi^2_{\text{S-B}} = 2892.841$, $p < 0.001$; CFI = 0.973; NNFI = 0.963; RMSEA = 0.064 [90% CI: 0.063–0.067]). The scale of measurement of each item ranges from 1 (*Totally disagree*) to 5 (*Totally agree*).

The Social Skills Scale was used to measure the levels of social skills [59]. This scale is composed of 12 items with values ranging from 1 (*Totally false*) to 7 (*Totally true*). This questionnaire is subdivided in 3 dimensions. The first of them is called “Communicative or relational skills” and it is composed of 5 items ($\alpha_{\text{communicative_social}} = 0.793$) (e.g. “*I have a hard time starting a conversation with someone I don't know*”). This dimension refers to the degree to which adolescents perceive that they are capable or not at communicating and relating to people [59]. The second dimension is “Assertiveness”, composed of 3 items ($\alpha_{\text{assertiveness}} = 0.747$) (e.g. “*I usually praise or congratulate my classmates when they do something well*”). Assertiveness refers to the perception that adolescents have about their ability to be assertive, that is, to express

their own ideas or request information in an appropriate way and without being aggressive [59]. Finally, the third dimension, “Conflict-resolution skills”, is composed of 4 items ($\alpha_{\text{conflict-resolution}} = 0.805$) (e.g. “When I have a problem with another boy or girl, I put myself in their shoes and try to fix it”). This dimension refers to the adolescent’s perceived ability to resolve conflictive interpersonal situations in which they can act to find solutions. The CFA showed optimal levels for the three-factor structure of the instrument ($\chi^2_{\text{S-B}} = 3953.279$, $p = 0.001$; CFI = 0.984; NNFI = 0.982; RMSEA = 0.055 [90% CI: .054-.057]).

Procedure

A similar procedure was followed in both countries. The researchers got in contact with the different educational centers—previously selected in a random way—and asked their management teams for cooperation. Once the data collection was approved by the center, an informed consent letter was delivered to the students’ family. Written informed consent was obtained from the parents/guardians via the schools. The only difference between both countries was due to the unequal presence of Information and Communication Technologies in their schools. In Spain the collection was online, while in Ecuador it was by means of questionnaires in paper format due to the poor availability of technological devices and the lack of access to internet in their schools. In both countries the same standard was used in data collection. The interviewers were trained through an information sheet and a written collection protocol. The interviewer solved all the doubts that the respondents had. In both countries, a class session was used for data collection. Anonymity in responses was preserved. Additionally, the participation to fill in the questionnaire was voluntary, and students were informed that they could revoke their consent at any time. No relevant incidences were detected when collecting data. The methodology followed the ethical principles according to the Declaration of Helsinki. The procedure was approved by the Ethics Committee of the University of Córdoba and the research was conducted in line with national and international ethical standards.

Data analysis

The following statistical programs were used to analyze the collected data: SPSS v.25 and EQS v.6.2. Specifically, SPSS was used for the descriptive results of the study and to calculate the reliability coefficient by means of the statistic Cronbach’s alpha. Involvement in cyberbullying by countries was analyzed with crossed tables including chi squared and Cramer’s V measure of association. Similarly, adjusted standardized residuals (ASR) were calculated to verify in what cells the differences were statistically significant. If ASR are higher than ± 1.96 , they indicate $p < 0.05$; if ASR values are higher than ± 2.58 , they show $p < 0.01$; and if values are higher than ± 3.27 , they show $p < 0.001$.

The EQS program was used to carry out the CFA of the instruments as well as to test the proposed structural equation model and the factorial invariance. The following indexes were used: Satorra-Bentler χ^2 ; Comparative Fit Index (CFI); Non-normed Fit Index (NNFI); Root Mean Square Error of Approximation (RMSEA) with the confidence interval at 90%; Standardized Root Mean Square Residual (SRMR); and Akaike Information Criterion (AIC). Hu and Bentler [69] state that if the values of the indexes CFI and NNFI are higher than 0.95, this shows a good fit to the model. If the values are lower than 0.08, it is adequate for the measure SRMR. For the RMSEA index, values lower than 0.05 show a good fit, and values ranging from 0.05 and 0.08 show a reasonable fit [72]. For structural equation models (SEM), the Least Squares (LS) estimation method was used, assuming the variables were absolute and using polichoric matrixes. The calculated SEM present the coefficients of determination adjusted r

squared (R^2), the standardized coefficients beta (β) and their significance value (p) with an asterisk.

The Delta (Δ) differences between the fit indicators (NNFI, CFI and SRMR) were also considered to test the invariance degree. The cut-off point suggested in the literature to accept the hypothesis of invariance across groups is a change of 0.01 [73]. A multigroup analysis was performed using EQS V.6.2 too.

In addition, effect sizes ($f^2 = 0.02$ – 0.14 [small]; 0.15 – 0.34 [medium]; ≥ 0.35 [large]), statistical power ($1 - \beta \geq 0.80$) and confidence interval (CI = 95%) were analyzed for each individual trajectory in the SEM of each country. In the case of R^2 , the standard error (SEE) was also included. These analyses were carried out with the G-Power program.

For all the statistics, the confidence interval was at least 95%, $p < 0.05$.

Results

Prevalence of cyberbullying

The levels of prevalence of cyberbullying were higher in Ecuador in comparison with Spain ($\chi^2 [3, 24943] = 763,030, p < 0.001$; V-Cramer = 0.175, $p < 0.001$). The prevalence of cyberaggressors, and especially cybervictim-cyberaggressor, was higher in Ecuador than in Spain. Nevertheless, the levels of cybervictims did not differ between both countries (see Table 1). If all the roles of involvement, cybervictims, cyberaggressors and cybervictim-cyberaggressors are considered, it can be observed that in Spain, 16.8% of Secondary students were involved in cyberbullying behaviors while this percentage amounts to 28.1% in the case of Ecuador.

Predictive capacity of psychosocial variables on cyberaggression and cybervictimization

To address the second objective, an analysis was carried out with structural equation models to test the hypothesized theoretical model, according to which the psychological variables considered in this study would significantly be related and influenced, which would allow to predict involvement in certain behaviors of cyberaggression and cybervictimization. A model per country was carried out to know the differences or similarities between both. In the model with the Ecuadorian sample, optimal fit indexes were obtained ($\chi^2_{S-B} = 4604.771$; $\chi^2_{S-B}/(1298) = 3.547$; $p < 0.001$; CFI = 0.983; NNFI = 0.982; RMSEA = 0.034 (90% CI [0.032, 0.036]); SRMR = 0.047; AIC = 4343.773), which explained 38% of variance for cybervictimization ($R^2 = 0.38$; $SEE = 0.577$; $p = 0.03$; $f^2 = 0.28$ [medium]) and 42% for cyberaggression ($R^2 = 0.42$; $SEE = 0.475$; $p = 0.02$; $f^2 = 0.31$ [medium]) (see Fig 1). In this model, high indexes of empathy

Table 1. Percentage of involvement in cyberbullying (CB).

		Spain (n = 14206)	Ecuador (n = 10737)
Role	Cybervictim	8.8%	8.7%
		ASR = .3	ASR = -.3
	Cyberaggressor	3.1%***	5.1%***
		ASR = -8.2	ASR = 8.2
	Cybervictim-Cyberaggressor	4.9%***	14.3%***
		ASR = -25.6	ASR = 25.6
	Not involved	83.2%***	71.9%***
		ASR = 21.4	ASR = -21.4

(*** $p < 0.001$), (ASR: Adjusted standardized residual).

<https://doi.org/10.1371/journal.pone.0241288.t001>

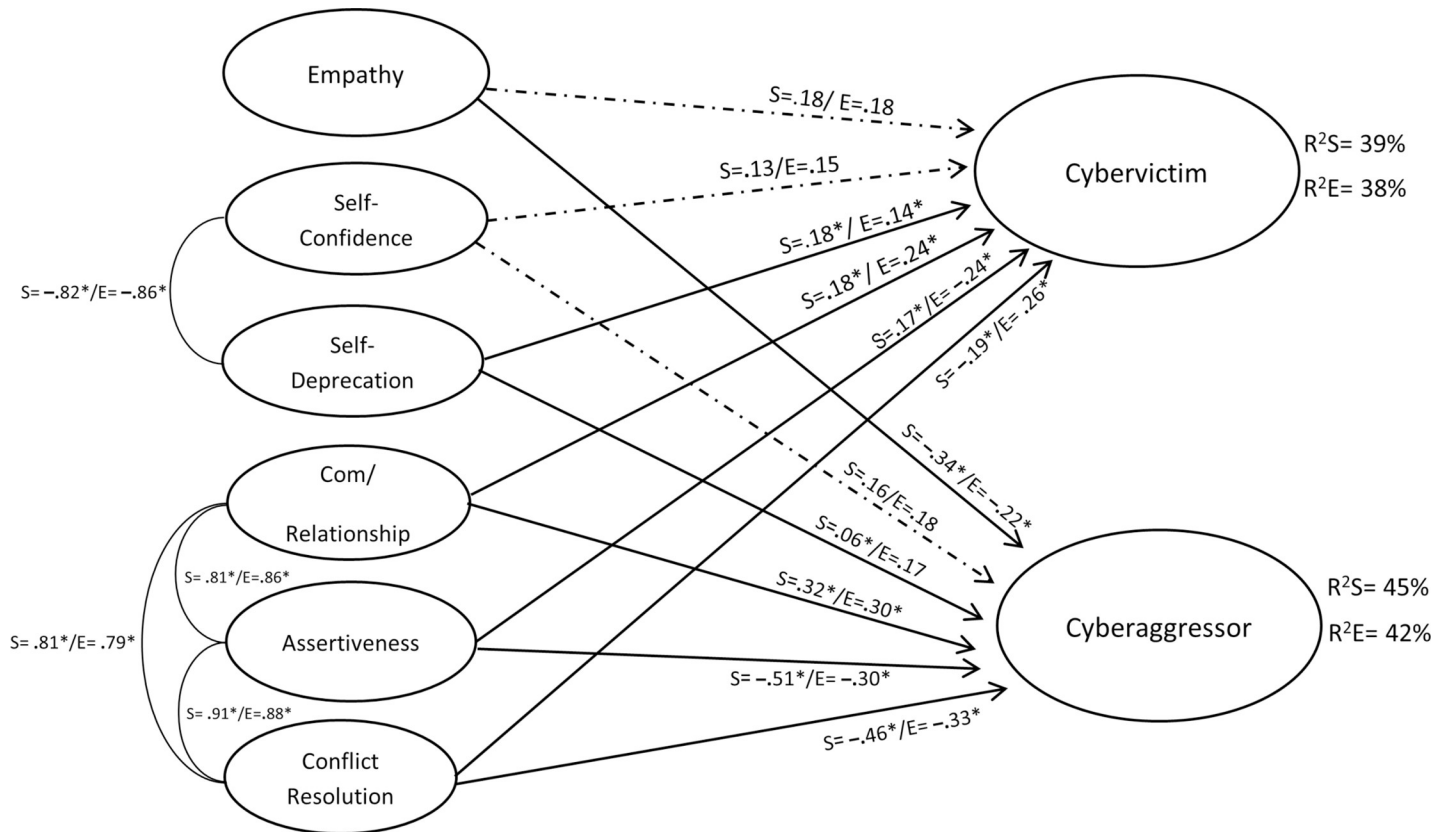


Fig 1. Model for the sample from Ecuador and Spain. E = Ecuador; S = Spain.

<https://doi.org/10.1371/journal.pone.0241288.g001>

predicted a lower involvement in cyberaggression; the same happened with assertiveness and conflict-resolution skills. Nevertheless, a high level of communicative and relational skills was associated with a higher level of cyberaggression. The other variables did not present any statistically significant incidence on cyberaggression. In the case of cybervictimization, high indexes of self-deprecation, high levels of communicative and relational skills, and high levels of conflict-resolution skills were associated with higher indexes of cybervictimization. Low levels of assertiveness were also linked to higher levels of cybervictimization.

In the Spanish sample, the model explained 39% of variance for cybervictimization ($R^2 = 0.39$; $SEE = 0.351$; $p = 0.03$; $f^2 = 0.21$ [medium]) and 45% for cyberaggression ($R^2 = 0.45$; $SEE = 0.286$; $p = 0.02$ $f^2 = 0.37$ [large]), (see Fig 1) with optimal fit indexes of the model ($\chi^2_{S-B} = 5609.460$; $\chi^2_{S-B} / (1298) = 4.321$; $p < 0.001$; CFI = 0.972; NNFI = 0.973; RMSEA = 0.052 (90% CI [0.050, 0.056]); SRMR = 0.067; AIC = 5345.461) (see Fig 1). What is more, the effect of self-deprecation must be added to the association of variables present in the Ecuadorian sample in the case of Spain, although with modest values. The higher the levels of self-deprecation are, the higher the levels of cyberaggression will be. In the case of cybervictimization, the model between countries is very similar. The only difference can be found in assertiveness and conflict-resolution skills, which are related to cybervictimization in an opposite sense to the previous model, that is, the higher the level of assertiveness is, the higher the level of cybervictimization will be; the lower the level of conflict-resolution skills is, the lower the cybervictimization will be.

Table 2. CFA by country and configuration and metric invariance.

Mod	Country			Multigroup Analysis		
	Spain	Ecuador	Unconstrained	Mod 1	Mod 2	Mod 3
χ^2_{S-B}	5609.460	4604.771	5003.501	5380.944	5690.461	5965.019
<i>df</i>	1298	1298	2618	2663	2716	2728
				($\Delta df = 45$)	($\Delta df = 98$)	($\Delta df = 110$)
<i>p</i>	0.001	0.001	0.001	0.003	0.013	0.017
NNFI	0.973	0.982	0.970	0.968	0.964	0.963
CFI	0.972	0.983	0.980	0.975	0.974	0.972
RMSEA	0.052	0.034	0.046	0.050	0.051	0.052
	[0.050, 0.056]	[0.032, 0.036]	[0.045, 0.046]	[0.049, 0.050]	[0.050, 0.052]	[0.050, 0.054]
SRMR	0.067	0.047	0.064	0.068	0.070	0.071
AIC	5345.461	4343.773	4376.177	5088.821	5175.601	5530.650
$\Delta\chi^2_{S-B}$			-	377.443	686.960	961.518
				(n. s.)	(n. s.)	(n. s.)
Δ NNFI			-	0.002	0.006	0.007
Δ CFI			-	0.005	0.006	0.008
Δ RMSEA			-	0.004	0.005	0.006
Δ SRMR			-	0.004	0.006	0.007

Mod 1 = constrained soft; Mod 2 = constrained medium; Mod 3 = constrained hard; n.s. = not significant.

<https://doi.org/10.1371/journal.pone.0241288.t002>

Predictors of cyberaggression and cybervictimization: Spain *versus* Ecuador

The factorial invariance was calculated between the samples obtained in Ecuador and Spain to test if both samples could share a common theoretical model. Initially, the indexes were obtained with the total sample of both countries ($\chi^2_{S-B} = 5362.323$; $\chi^2_{S-B} / (1298) = 4.131$; $p < .001$; CFI = 0.973; NNFI = 0.974; RMSEA = 0.050 (90% CI [0.048, 0.052]); SRMR = 0.066; AIC = 5827.193), obtaining optimal adjustments (see Fig 1). Then the results showed the existence of a configural and metric invariance since the delta values (Δ) were below the cut-off point (see Table 2). Therefore, it can be suggested that the structure of the predictive-explanatory model of involvement for cyberbullying is similar in both countries.

Likewise, the statistical powers and the size of the effects for each individual trajectory showed adequate values, all with high power ($1-\beta > 0.80$) and with mean effect values ($f^2 = 0.15-0.35$) in both countries (see Table 3).

Discussion

In Spain, nearly 2 out of every 10 adolescents are directly involved in cyberbullying. In Ecuador, the situation is even more worrying as nearly 3 out of every 10 adolescents are involved in cyberbullying. These levels of involvement are significantly higher than the findings observed by Lee et al. in the USA [26]. However, the levels observed in the present study are within the ranges of involvement described in a recent systematic review of studies conducted in the USA [27]. In Spain, the level of involvement reported in the present study is, in comparison with other previous studies: lower than 3 out of every 10 students observed by other studies [28, 29]; and consistent with the results obtained by Herrera-López, Casas, et al. [33]. In Ecuador, the level of involvement detected in the present study is significantly higher to the one detected in its neighbor country Colombia [33].

Table 3. Statistical power, effect size, and confidence interval for each individual trajectory.

Dependent Variable (Country)	Independent Variable	β	<i>p</i>	1 - β	f^2	(CI 95%)	
						Lower limit	Upper limit
Cyber-victimization (Ecuador)	Empathy	0.18	0.134	–	–	–	–
	Self-Confidence	0.15	0.234	–	–	–	–
	Self-Deprecation	0.14	0.021	0.961	0.201	0.142	0.170
	Com/Relationship	0.24	0.040	0.901	0.120	0.107	0.115
	Assertiveness	-0.24	0.012	0.966	0.192	-0.130	-0.108
	Conflict Resolution	0.26	0.019	0.928	0.231	0.007	0.026
Cyber-victimization (Spain)	Empathy	0.18	0.064	–	–	–	–
	Self-Confidence	0.13	0.191	–	–	–	–
	Self-Deprecation	0.18	0.035	0.972	0.308	0.154	0.162
	Com/Relationship	0.18	0.030	0.952	0.221	0.183	0.197
	Assertiveness	0.17	0.022	0.988	0.197	0.083	0.105
	Conflict Resolution	-0.19	0.020	0.952	0.291	-0.042	-0.021
Cyber-aggression (Ecuador)	Empathy	-0.22	0.037	0.928	0.231	-0.144	-0.121
	Self-Confidence	0.18	0.531	–	–	–	–
	Self-Deprecation	0.17	0.481	–	–	–	–
	Com/Relationship	0.30	0.029	0.992	0.112	0.111	0.133
	Assertiveness	-0.30	0.012	0.951	0.120	-0.126	-0.102
	Conflict Resolution	-0.33	0.047	0.901	0.192	-0.201	-0.166
Cyber-aggression (Spain)	Empathy	-0.34	0.044	0.955	0.226	-0.221	-0.182
	Self-Confidence	0.16	0.301	–	–	–	–
	Self-Deprecation	0.06	0.021	0.904	0.188	0.043	0.055
	Com/Relationship	0.32	0.028	0.919	0.201	0.187	0.205
	Assertiveness	-0.51	0.045	0.973	0.272	-0.381	-0.327
	Conflict Resolution	-0.46	0.011	0.942	0.220	-0.292	-0.260

β = Standardized beta coefficient; *p* = significance (≤ 0.05); 1 - β = statistical power; f^2 = effect size.

<https://doi.org/10.1371/journal.pone.0241288.t003>

In Spain and Ecuador, 1 out of every 10 adolescents recognizes him/herself as a cybervictim. This prevalence of cybervictims doubles the one observed by Lee et al. [26] and Chen et al. [17] with other different instruments. However, it is consistent with the prevalence of cybervictimization observed in Spain in different studies [28, 33, 34], carried out with the same instruments.

It is concluded that 3 out of every 100 adolescents recognize themselves as cyberaggressors in Spain, while in Ecuador the figure amounts to 5 out of every 100. The prevalence of cyberaggression in Spain is consistent with the one shown in previous studies in the USA [26] and in Spain [28, 33, 34]. The prevalence of cyberaggressors in Ecuador is equivalent to the one shown in Spain and higher to the one in Colombia [34].

Additionally, 5 out of every 100 people recognize themselves as cybervictims-cyberaggressors in Spain, while in Ecuador the figure amounts to 14 out of every 100. The prevalence of cybervictims-cyberaggressors in Spain is consistent with the one observed in studies carried out by Lee et al. in the USA [26] and in Spain [28, 33, 34]. Nevertheless, the prevalence of cybervictims-cyberaggressors in Ecuador is much higher than the one observed in studies carried out in different countries [28, 33, 34].

As we have noted, the rates of involvement in cyberbullying in Ecuador, especially in cyberaggression and cybervictim-cyberaggression, are higher than in Spain. This may be due to the fact that the rate of violence in Ecuador, if we measure it in terms of homicides, is much higher

than that of Spain [74]. This situation can explain this difference in terms of another type of interpersonal violence such as cyberbullying.

As noted above, cyberbullying rates in Ecuador are higher than in neighboring Colombia. This is especially worrisome given that Colombia has higher levels of violence, in general terms, than Ecuador [74]. The fact that in South American countries the prevalence rates of cyberbullying are higher than in Europe or North America may be due to the normalization of violence that occurs in the most disadvantaged countries. This normalization in the society may be reflected in educational centers. In the same way, a shortage of scientifically valid programs has been detected in the South American continent [75], which probably affects this high prevalence. Self-esteem was expected to be negatively associated with cybervictimization [40, 44, 45]. This was the case not only in the Spanish adolescents but also in the Ecuadorian ones: self-deprecation was positively associated with cybervictimization. Positive self-esteem (or self-confidence) did not show an association with cybervictimization. This makes think that emotional aspects linked to a negative self-worth are those more connected to the risk of being a cybervictim.

Based on Brewer & Kerslake's study [44] on nearly 100 British adolescents, the hypothesis was that empathy will be associated with cybervictimization. Based on the conclusions drawn in Zych et al.'s review [55], it was expected that empathy would be positively associated with cybervictimization. Nevertheless, empathy did not show an association with cybervictimization either for Spanish or Ecuadorian adolescents. This may be due to the fact that in the present study we have considered empathy as a unifactorial construct, while in the Zych et al., reviews it was specified that it was affective empathy and not general empathy (cognitive empathy and affective empathy) that would be related to cybervictimization [55]. When considering empathy as a whole, it has not shown an association with cybervictimization as indicated by the authors [55].

Some authors have revealed the existence of an association between social skills and cybervictimization [66, 67]. This relation was observed in both Spanish and Ecuadorian adolescents. Communicative and relational social skills were positively associated with cybervictimization in both countries. However, assertiveness was positively associated with cybervictimization in Spain and negatively associated with it in Ecuador. Conflict-resolution skills were negatively associated with cybervictimization in Spain and positively in Ecuador. The transnational differences detected, regarding the prediction of cyber-aggression based on assertiveness and the ability to resolve conflicts, could have an explanation based on cultural and contextual differences. It is possible that students who feel they have more conflict resolution skills and are less assertive, in the relationships between schoolchildren in Ecuador -with rates of interpersonal violence much higher than those in Spain- have a greater chance of coming into conflict with other classmates. This could condition that they are more likely to suffer cybervictimization. On the other hand, in the relationships between schoolchildren in Spain -with lower levels of interpersonal violence and better school climate-it could be interpreted that being more assertive but with less conflict resolution skills could influence some students to have more confrontations and being the target of cybervictimization. The predictive ability of social skills observed on wide samples of adolescents in Spain and Ecuador contrast with the observation in a previous study in Spain that used the same instruments for each one of the controlled ethnic-cultural groups [7], where social skills did not show a predictive capacity of cybervictimization.

Self-esteem was expected to be negatively associated with cyberaggression [44, 45]. This hypothesis is only confirmed in adolescents from Spain: negative self-esteem (or self-deprecation) is associated with cyberaggression. However, this hypothesis was not confirmed in Ecuador. Perhaps, in more violent societies, such as Ecuador, the fact of being a cyberbully would

not be so associated with psychological variables as with context variables. But this hypothesis should be contrasted with specific studies.

Considering previous studies, empathy was expected to be negatively associated with cyberaggression [44, 52]. This hypothesis is confirmed in both Spanish and Ecuadorian adolescents. In fact, this is consistent with the conclusion of Zych et al.'s meta-analysis [55]: high levels of cyberaggression are related to low levels of empathy.

Social skills were expected to show an association with cyberaggression. This hypothesis is confirmed in the samples of adolescents from Spain and Ecuador. Regarding each of the social skills studied in the present work, the different countries show equivalent predictive patterns. Cyberaggression could be: positively associated by means of communicative and relational skills; and negatively associated by means of assertiveness and conflict-resolution skills. The predictive capacity of communicative and relational skills and assertiveness is consistent with the previous observation of another study carried out in Spain only on some ethnic-cultural subgroups [7].

There are cultural similarities between Spain and Ecuador due to the language and reciprocal historical influence. However, there are great differences regarding their socio-economic level, ethnic-cultural diversity, access and availability of technology and internet, parenting styles and education, among others. It is possible that these differences have an influence on the differences observed between countries both in the roles of involvement and in the predictors of cyberbullying (e.g., assertiveness and conflict resolution skills predict cybervictimization in the opposite direction in Spain and in Ecuador).

Strengths, limitations, and future lines of research

The present study has some limitations but also allows to move forward into the development of some new lines of research. The transversal methodology by means of self-reports, despite fitting the objectives and hypothesis under study, presents some limitations as well. Due to the methodology used (cross-sectional study), causality cannot be inferred so the reason why the relationships occur is unknown. If being involved in cyberbullying influences psychosocial variables or by having certain psychosocial variables, one is more likely to become involved in this phenomenon, either in cyberaggression or cybervictimization. Another limitation of the study is the lack of participation/rejection rates due to the large volume of participating centers. It would have been interesting to know the reasons for the refusal to participate in the study, in this way it could be known if there has been any repetitive error in the sample. For example, centers with higher rates of cyberbullying refuse to participate due to the fear that their results will be known.

Although a common data collection protocol was established in both countries, the fact of collecting data in Spain online and in Ecuador on paper may have influenced the results. Perhaps using a paper support can make participants more task-focused and respond more accurately. These possible differences should be tested in the future.

Despite these limitations, our study combines a large sample obtained in two countries with robust analyzes that allow us to improve our knowledge of cyberbullying and its psychosocial predictors. For future research, data collection could combine self-reports and hetero-reports and triangulate the results regarding involvement in cyberbullying through different roles. It could be interesting to carry out longitudinal studies on this matter. This would make possible to know about the evolution of cyberbullying and move from the prediction to the deepening in knowledge of protective factors and precursors of this phenomenon. It would be convenient that future studies on cyberbullying would consider not only the transcultural comparison between different countries but also the ethnic-cultural comparison within each country [7].

It would also be convenient to include in future studies the registry of variables related to parenting and educational styles, as well as access and availability of technology and the Internet, since they could show a relationship or explain some of the possible transnational differences. In the same way, it would be interesting to explore whether there were differences between genders or ages. By obtaining this information we will be able to be more precise when it comes to knowing the variables that most influence cyberbullying and develop better programs for its prevention.

Another possible line of work could investigate whether in different types of cyber-aggression and cybervictimization these SEM models would be maintained or would change substantially. Cyberbullying does not manifest itself in a single way, but it can have different faces. Knowing all of them in depth will give us a better knowledge.

Conclusions

Our findings show that the incidence of cyberbullying in Ecuador is higher than in Spain. Moreover, self-deprecation, communicative or relational skills, assertiveness and conflict-resolution skills were significantly associated with cybervictimization. These psychosocial variables together with empathy were significantly associated with cyberaggression. From the conclusions regarding the prevalence of cyberbullying, it would be convenient to develop specific educational programs of prevention both in Secondary Education and at the final stage of Primary Education. This could contribute to anticipate its emergence. From the conclusions regarding the prediction of cyberbullying, it can be inferred that there are several aspects that such preventive educational programs should include. The prediction patterns of cyberaggression between countries are very consistent. This makes possible to create a prevention proposal of cyberaggression from a transcultural point of view. The proposal would be based on socioemotional support and education in order to: a) dissolve and avoid negative self-esteem; b) stimulate the development of affective and cognitive empathy; and c) promote assertive behavior and conflict-resolution skills. However, the prediction patterns of cybervictimization between countries are less consistent. Taking similarities into account, the prevention proposal of cybervictimization of transcultural nature could consider the socioemotional support and education in order to: a) manage and overcome negative self-worth; and b) successfully develop communicative/relational social skills, assertiveness and conflict-resolution skills.

Universal prevention and intervention proposals could be more effective if they could be adapted and specified considering cultural aspects of cultural groups that could be helpful. The differences in the access to cyberspace, technological development, customs, habits, and cultural values, among other aspects, could condition the degree of involvement and the weight of protective factors and precursors of cyberbullying.

Author Contributions

Conceptualization: Antonio J. Rodríguez-Hidalgo, Oswaldo Mero, Eva Solera, Mauricio Herrera-López, Juan Calmaestra.

Data curation: Oswaldo Mero, Eva Solera.

Formal analysis: Antonio J. Rodríguez-Hidalgo, Mauricio Herrera-López, Juan Calmaestra.

Funding acquisition: Juan Calmaestra.

Investigation: Antonio J. Rodríguez-Hidalgo, Oswaldo Mero, Eva Solera, Juan Calmaestra.

Methodology: Antonio J. Rodríguez-Hidalgo, Mauricio Herrera-López, Juan Calmaestra.

Project administration: Antonio J. Rodríguez-Hidalgo, Juan Calmaestra.

Resources: Antonio J. Rodríguez-Hidalgo, Juan Calmaestra.

Supervision: Antonio J. Rodríguez-Hidalgo, Mauricio Herrera-López, Juan Calmaestra.

Validation: Antonio J. Rodríguez-Hidalgo, Mauricio Herrera-López, Juan Calmaestra.

Writing – original draft: Antonio J. Rodríguez-Hidalgo, Mauricio Herrera-López, Juan Calmaestra.

Writing – review & editing: Antonio J. Rodríguez-Hidalgo, Mauricio Herrera-López, Juan Calmaestra.

References

1. Baytemir K. Experiences of School as a Mediator between Interpersonal Competence and Happiness in Adolescents. *An Psicol.* 2019; 35: 259–268. <https://doi.org/10.6018/analesps.35.2.320311>
2. Ferreira TR de SC, Deslandes SF. Cyberbullying: conceituações, dinâmicas, personagens e implicações à saúde. *Cien Saude Colet.* 2018; 23: 3369–3379. <https://doi.org/10.1590/1413-812320182310.13482018> PMID: 30365856
3. Pieper AK, Pieper M. The insulting Internet: universal access and cyberbullying. *Univers Access Inf Soc.* 2017; 16: 497–504. <https://doi.org/10.1007/s10209-016-0474-z>
4. Shapka JD, Maghsoudi R. Examining the validity and reliability of the cyber-aggression and cyber-victimization scale. *Comput Human Behav.* 2017; 69: 10–17. <https://doi.org/10.1016/j.chb.2016.12.015>
5. Zych I, Ortega-Ruiz R, Del Rey R. Scientific research on bullying and cyberbullying: Where have we been and where are we going. *Aggress Violent Behav.* 2015; 24: 188–198. <https://doi.org/10.1016/j.avb.2015.05.015>
6. Del Rey R, Ortega R. Bullying in poor countries: Prevalence and coexistence with other forms of violence (Bullying en los países pobres: Prevalencia y coexistencia con otras formas de violencia). *Int J Psychol Psychol Ther.* 2008; 8: 39–50. Available: <http://www.scopus.com/inward/record.url?eid=2-s2.0-54349095637&partnerID=40>
7. Rodríguez-Hidalgo AJ, Solera E, Calmaestra J. Psychological Predictors of Cyberbullying According to Ethnic-Cultural Origin in Adolescents: A National Study in Spain. *J Cross Cult Psychol.* 2018; 49: 1506–1522. <https://doi.org/10.1177/0022022118795283>
8. Rodríguez-Hidalgo AJ, Pantaleón Y, Calmaestra J. Psychological Predictors of Bullying in Adolescents From Pluricultural Schools: A Transnational Study in Spain and Ecuador. *Front Psychol.* 2019; 10. <https://doi.org/10.3389/fpsyg.2019.01383> PMID: 31275205
9. Kowalski RM, Morgan CA, Limber SP. Traditional bullying as a potential warning sign of cyberbullying. *Sch Psychol Int.* 2012; 33: 505–519. <https://doi.org/10.1177/0143034312445244>
10. Ybarra ML, Espelage DL, Mitchell KJ. Differentiating Youth Who Are Bullied From Other Victims of Peer-Aggression: The Importance of Differential Power and Repetition. *J Adolesc Heal.* 2014; 55: 293–300. <https://doi.org/10.1016/j.jadohealth.2014.02.009> PMID: 24726463
11. Del Rey R, Casas JA, Ortega-Ruiz R, Schultze-Krumholz A, Scheithauer H, Smith PK, et al. Structural validation and cross-cultural robustness of the European Cyberbullying Intervention Project Questionnaire. *Comput Human Behav.* 2015; 50: 141–147. <http://dx.doi.org/10.1016/j.chb.2015.03.065>
12. Slonje R, Smith PK, Frisén A. Processes of cyberbullying, and feelings of remorse by bullies: A pilot study. *Eur J Dev Psychol.* 2012; 9: 244–259. <https://doi.org/10.1080/17405629.2011.643670>
13. Smith PK, Mahdavi J, Carvalho M, Fisher S, Russell S, Tippett N. Cyberbullying: its nature and impact in secondary school pupils. *J Child Psychol Psychiatry.* 2008; 49: 376–385. <https://doi.org/10.1111/j.1469-7610.2007.01846.x> PMID: 18363945
14. Machimbarrena JM, Garaigordobil M. Bullying/Cyberbullying en quinto y sexto curso de primaria: Diferencias entre centros públicos y privados. *An Psicol.* 2017; 33: 319–326. <https://doi.org/10.6018/analesps.33.2.249381>
15. Cerezo F, Arnaiz P, Gimenez AM, Maquilón JJ. Conductas de ciberadicción y experiencias de cyberbullying entre adolescentes. *An Psicol.* 2016; 32: 761. <https://doi.org/10.6018/analesps.32.3.217461>
16. Betts LR, Spenser KA, Gardner SE. Adolescents' Involvement in Cyber Bullying and Perceptions of School: The Importance of Perceived Peer Acceptance for Female Adolescents. *Sex Roles.* 2017; 77: 471–481. <https://doi.org/10.1007/s11199-017-0742-2> PMID: 28979061

17. Chen Q, Lo CKM, Zhu Y, Cheung A, Chan KL, Ip P. Family poly-victimization and cyberbullying among adolescents in a Chinese school sample. *Child Abuse Negl.* 2018; 77: 180–187. <https://doi.org/10.1016/j.chiabu.2018.01.015> PMID: 29407606
18. Peled Y. Cyberbullying and its influence on academic, social, and emotional development of undergraduate students. *Heliyon.* 2019; 5: e01393. <https://doi.org/10.1016/j.heliyon.2019.e01393> PMID: 30963126
19. Rodríguez-Hidalgo AJ, Hurtado-Mellado A. Prevalence and Psychosocial Predictors of Homophobic Victimization among Adolescents. *Int J Environ Res Public Health.* 2019; 16: 1243. <https://doi.org/10.3390/ijerph16071243> PMID: 30965577
20. Hutson E. Cyberbullying in Adolescence. *Adv Nurs Sci.* 2016; 39: 60–70. <https://doi.org/10.1097/ANS.000000000000104> PMID: 26836994
21. Bergmann MC, Baier D. Prevalence and correlates of cyberbullying perpetration. Findings from a German representative student survey. *Int J Environ Res Public Health.* 2018; 15. <https://doi.org/10.3390/ijerph15020274> PMID: 29415426
22. Quintana-Orts C, Rey L. Forgiveness and cyberbullying in adolescence: Does willingness to forgive help minimize the risk of becoming a cyberbully? *Comput Human Behav.* 2018; 81: 209–214. <https://doi.org/10.1016/j.chb.2017.12.021>
23. Baldry AC, Farrington DP, Sorrentino A. “Am I at risk of cyberbullying”? A narrative review and conceptual framework for research on risk of cyberbullying and cybervictimization: The risk and needs assessment approach. *Aggress Violent Behav.* 2015; 23: 36–51. <https://doi.org/10.1016/j.avb.2015.05.014>
24. Salmivalli C, Lagerspetz K, Bjorkqvist K, Osterman K, Kaukiainen A. Bullying as a Group Process: Participant Roles and Their Relations to Social Status Within the Group. *Aggress Behav.* 1996; 22: 1–15.
25. Garaigordobil M. Conducta antisocial: conexión con bullying/cyberbullying y estrategias de resolución de conflictos. *Psychosoc Interv.* 2017; 26: 47–54. <https://doi.org/10.1016/j.psi.2015.12.002>
26. Lee J, Hong JS, Resko SM, Tripodi SJ. Face-to-Face Bullying, Cyberbullying, and Multiple Forms of Substance Use Among School-Age Adolescents in the USA. *School Ment Health.* 2018; 10: 12–25. <https://doi.org/10.1007/s12310-017-9231-6>
27. Selkie EM, Fales JL, Moreno MA. Cyberbullying Prevalence Among US Middle and High School–Aged Adolescents: A Systematic Review and Quality Assessment. *J Adolesc Heal.* 2016; 58. <https://doi.org/10.1016/j.jadohealth.2015.09.026> PMID: 26576821
28. García-Fernández CM, Romera-Félix EM, Ortega-Ruiz R. Relaciones entre el bullying y el cyberbullying: prevalencia y co-ocurrencia. *Pensam Psicológico.* 2015; 14: 49–61. <https://doi.org/10.11144/Javerianacali.PPSI14-1.rbcj>
29. Larrañaga E, Yubero S, Ovejero A, Navarro R. Loneliness, parent-child communication and cyberbullying victimization among Spanish youths. *Comput Human Behav.* 2016; 65: 1–8. <https://doi.org/10.1016/j.chb.2016.08.015>
30. Martínez J, Rodríguez-Hidalgo AJ, Zych I. Bullying and Cyberbullying in Adolescents from Disadvantaged Areas: Validation of Questionnaires; Prevalence Rates; and Relationship to Self-Esteem, Empathy and Social Skills. *Int J Environ Res Public Health.* 2020; 17: 6199. <https://doi.org/10.3390/ijerph17176199> PMID: 32859073
31. Pieschl S, Kuhlmann C, Porsch T. Beware of Publicity! Perceived Distress of Negative Cyber Incidents and Implications for Defining Cyberbullying. *J Sch Violence.* 2015; 14. <https://doi.org/10.1080/15388220.2014.971363>
32. Calmaestra J, Rodríguez-Hidalgo AJ, Mero-Delgado O, Solera E. Cyberbullying in Adolescents from Ecuador and Spain: Prevalence and Differences in Gender, School Year and Ethnic-Cultural Background. *Sustainability.* 2020; 12. <https://doi.org/10.3390/su12114597>
33. Herrera-López M, Casas JA, Romera EM, Ortega-Ruiz R, Del Rey R. Validation of the European Cyberbullying Intervention Project Questionnaire for Colombian Adolescents. *Cyberpsychology, Behav Soc Netw.* 2017; 20: 117–125. <https://doi.org/10.1089/cyber.2016.0414> PMID: 28061035
34. Herrera-López M, Romera E, Ortega-Ruiz R. Bullying y cyberbullying en Colombia; coocurrencia en adolescentes escolarizados. *Rev Latinoam Psicol.* 2017; 49: 163–172. <https://doi.org/10.1016/j.rlp.2016.08.001>
35. Lee C, Shin N. Prevalence of cyberbullying and predictors of cyberbullying perpetration among Korean adolescents. *Comput Human Behav.* 2017; 68: 352–358. <https://doi.org/10.1016/j.chb.2016.11.047>
36. López-Pradas IC, Romera EM, Casas JA, Ortega-Ruiz R. Cybergossip and cyberbullying during primary school years. *Psicol Educ.* 2017; 23: 73–80. <https://doi.org/10.1016/j.pse.2017.05.007>
37. Zych I, Farrington DP, Ttofi MM. Protective factors against bullying and cyberbullying: A systematic review of meta-analyses. *Aggression and Violent Behavior.* 2018. <https://doi.org/10.1016/j.avb.2018.04.001> PMID: 30713462

38. Rosenberg M. *Society and the adolescent self-image*. (Rev. ed.). Middletown, CT: Wesleyan University Press; 1989.
39. Extremera N, Quintana-Orts C, Mérida-López S, Rey L. Cyberbullying Victimization, Self-Esteem and Suicidal Ideation in Adolescence: Does Emotional Intelligence Play a Buffering Role? *Front Psychol*. 2018; 9: 1–9. <https://doi.org/10.3389/fpsyg.2018.00001> PMID: 29410639
40. Mobin A, Feng CX, Neudorf C. Cybervictimization among preadolescents in a community-based sample in Canada: Prevalence and predictors. *Can J Public Heal*. 2017; 108: e475–e481. <https://doi.org/10.17269/cjph.108.5878> PMID: 29356652
41. Wolke D, Lee K, Guy A. Cyberbullying: a storm in a teacup? 2017; 26: 899–908. <https://doi.org/10.1007/s00787-017-0954-6> PMID: 28188382
42. You S, Lee Y, Kim E. Physical, Social, and Cyberbullying: Relationships with Adolescents' Psychosocial Factors. *Child Indic Res*. 2016; 9: 805–823. <https://doi.org/10.1007/s12187-015-9338-y>
43. Bayraktar F, Machackova H, Dedkova L, Cerna A, Ševčíková A. Cyberbullying. *J Interpers Violence*. 2015; 30: 3192–3216. <https://doi.org/10.1177/0886260514555006> PMID: 25411234
44. Brewer G, Kerslake J. Cyberbullying, self-esteem, empathy and loneliness. *Comput Human Behav*. 2015; 48: 255–260. <https://doi.org/10.1016/j.chb.2015.01.073>
45. Modecki KL, Barber BL, Vernon L. Mapping Developmental Precursors of Cyber-Aggression: Trajectories of Risk Predict Perpetration and Victimization. *J Youth Adolesc*. 2013; 42: 651–661. <https://doi.org/10.1007/s10964-012-9887-z> PMID: 23242509
46. Garaigordobil M. Psychometric Properties of the Cyberbullying Test, a Screening Instrument to Measure Cybervictimization, Cyberaggression, and Cyberobservation. *J Interpers Violence*. 2017; 32: 3556–3576. <https://doi.org/10.1177/0886260515600165> PMID: 26289455
47. Jolliffe D, Farrington DP. Development and validation of the Basic Empathy Scale. *J Adolesc*. 2006; 29: 589–611. <https://doi.org/10.1016/j.adolescence.2005.08.010> PMID: 16198409
48. Jolliffe D, Farrington DP. Is low empathy related to bullying after controlling for individual and social background variables? *J Adolesc*. 2011; 34: 59–71. <https://doi.org/10.1016/j.adolescence.2010.02.001> PMID: 20202677
49. Andreychik MR, Lewis E. Will you help me to suffer less? How about to feel more joy? Positive and negative empathy are associated with different other-oriented motivations. *Pers Individ Dif*. 2017; 105: 139–149. <https://doi.org/10.1016/j.paid.2016.09.038>
50. Machackova H, Pfetsch J. Bystanders' responses to offline bullying and cyberbullying: The role of empathy and normative beliefs about aggression. *Scand J Psychol*. 2016; 57: 169–176. <https://doi.org/10.1111/sjop.12277> PMID: 26946454
51. Ang RP, Li X, Seah SL. The Role of Normative Beliefs About Aggression in the Relationship Between Empathy and Cyberbullying. *J Cross Cult Psychol*. 2017; 48: 1138–1152. <https://doi.org/10.1177/0022022116678928>
52. Del Rey R, Lazuras L, Casas JA, Barkoukis V, Ortega-Ruiz R, Tsorbatzoudis H. Does empathy predict (cyber) bullying perpetration, and how do age, gender and nationality affect this relationship? *Learn Individ Differ*. 2016; 45: 275–281. <https://doi.org/10.1016/j.lindif.2015.11.021>
53. Schultze-Krumbholz A, Schultze M, Zagorscak P, Wölfer R, Scheithauer H. Feeling cybervictims' pain—The effect of empathy training on cyberbullying. *Aggress Behav*. 2016; 42: 147–156. <https://doi.org/10.1002/ab.21613> PMID: 26349848
54. Chan HC (Oliver), Wong DSW. Coping with cyberbullying victimization: An exploratory study of Chinese adolescents in Hong Kong. *Int J Law, Crime Justice*. 2017; 50: 71–82. <https://doi.org/10.1016/j.ijlcrj.2017.04.003>
55. Zych I, Baldry AC, Farrington DP, Llorent VJ. Are children involved in cyberbullying low on empathy? A systematic review and meta-analysis of research on empathy versus different cyberbullying roles. *Aggress Violent Behav*. 2019; 45: 83–97. <https://doi.org/10.1016/j.avb.2018.03.004>
56. Athanasiades C, Baldry AC, Kamarotis T, Kostouli M, Psalti A. The “net” of the Internet: Risk Factors for Cyberbullying among Secondary-School Students in Greece. *Eur J Crim Policy Res*. 2016; 22: 301–317. <https://doi.org/10.1007/s10610-016-9303-4>
57. Pfetsch JS. Empathic Skills and Cyberbullying: Relationship of Different Measures of Empathy to Cyberbullying in Comparison to Offline Bullying Among Young Adults. *J Genet Psychol*. 2017; 178: 58–72. <https://doi.org/10.1080/00221325.2016.1256155> PMID: 28121287
58. Dryburgh NSJ, Khullar TH, Sandre A, Persram RJ, Bukowski WM, Dirks MA. Evidence Base Update for Measures of Social Skills and Social Competence in Clinical Samples of Youth. *J Clin Child Adolesc Psychol*. 2020; 1–23. <https://doi.org/10.1080/15374416.2020.1790381> PMID: 32697122
59. Oliva A, Antolín Suárez L, Pertegal Vega MÁ, Ríos Bermúdez M, Parra Jiménez Á, Hernando Gómez Á, et al. Instrumentos para la evaluación de la salud mental y el desarrollo positivo adolescente y los

- activos que lo promueven. Sevilla: Junta de Andalucía. Consejería de Salud; 2011. Available: http://www.formajoven.org/AdminFJ/doc_recursos/201241812465364.pdf
60. Romera E-M, Cano J-J, García-Fernández C-M, Ortega-Ruiz R. Cyberbullying: Social Competence, Motivation and Peer Relationships. *Comunicar*. 2016; 24: 71–79. <https://doi.org/10.3916/C48-2016-07>
 61. Hemphill SA, Tollit M, Herrenkohl TI. Protective Factors Against the Impact of School Bullying Perpetration and Victimization on Young Adult Externalizing and Internalizing Problems. *J Sch Violence*. 2014; 13: 125–145. <https://doi.org/10.1080/15388220.2013.844072> PMID: 25419190
 62. Seigfried-Spellar KC, O'Quinn CL, Treadway KN. Assessing the relationship between autistic traits and cyberdeviancy in a sample of college students. *Behav Inf Technol*. 2015; 34: 533–542. <https://doi.org/10.1080/0144929x.2014.978377>
 63. Jacobs NCL, Dehue F, Völlink T, Lechner L. Determinants of adolescents' ineffective and improved coping with cyberbullying: A Delphi study. *J Adolesc*. 2014; 37: 373–385. <https://doi.org/10.1016/j.adolescence.2014.02.011> PMID: 24793384
 64. Hutson E, Kelly S, Militello LK. Systematic Review of Cyberbullying Interventions for Youth and Parents With Implications for Evidence-Based Practice. *Worldviews Evidence-Based Nurs*. 2018; 15: 72–79. <https://doi.org/10.1111/wvn.12257> PMID: 28859246
 65. Navarro R, Larrañaga E, Yubero S. Differences between Preadolescent Victims and Non-Victims of Cyberbullying in Cyber-Relationship Motives and Coping Strategies for Handling Problems with Peers. *Curr Psychol*. 2018; 37: 116–127. <https://doi.org/10.1007/s12144-016-9495-2>
 66. Hemphill SA, Heerde JA. Adolescent predictors of young adult cyberbullying perpetration and victimization among Australian youth. *J Adolesc Heal*. 2014; 55. <https://doi.org/10.1016/j.jadohealth.2014.04.014> PMID: 24939014
 67. Navarro R, Yubero S, Larrañaga E, Martínez V. Children's Cyberbullying Victimization: Associations with Social Anxiety and Social Competence in a Spanish Sample. *Child Indic Res*. 2012; 5: 281–295. <https://doi.org/10.1007/s12187-011-9132-4>
 68. Ortega-Ruiz R, Del Rey R, Casas JA. Evaluar el bullying y el cyberbullying validación española del EBIP-Q y del ECIP-Q. *Psicol Educ*. 2016; 22: 71–79. <https://doi.org/10.1016/j.pse.2016.01.004>
 69. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Model A Multidiscip J*. 1999; 6: 1–55. <https://doi.org/10.1080/10705519909540118>
 70. Martín-Albo J, Núñez JL, Navarro JG, Grijalvo F. The Rosenberg Self-Esteem Scale: Translation and Validation in University Students. *Span J Psychol*. 2007; 10: 458–467. <https://doi.org/10.1017/s1138741600006727> PMID: 17992972
 71. Viejo C. 'Dating violence' y cortejo adolescente Un estudio sobre la violencia en las parejas sentimentales de los jóvenes andaluces. Sevilla: Fundación Pública Andaluza Centro de Estudios Andaluces, Consejería de la Presidencia, Junta de Andalucía; 2014.
 72. Browne MW, Cudeck R. Alternative ways of assessing model fit.: Sage., In: Bollen KA, Long JS, editors. *Testing structural equation models*. Newbury Park, CA: SAGE; 1993. pp. 136–162.
 73. Dimitrov DM. Testing for Factorial Invariance in the Context of Construct Validation. *Meas Eval Couns Dev*. 2010; 43: 121–149. <https://doi.org/10.1177/0748175610373459>
 74. World Health Organization. World Health Statistics data visualizations dashboard, Year 2016: Homicide. 2018. Available: <https://apps.who.int/gho/data/node.sdg.16-1-viz-1?>
 75. Gaffney H, Tfofi MM, Farrington DP. Evaluating the effectiveness of school-bullying prevention programs: An updated meta-analytical review. *Aggress Violent Behav*. 2019; 45: 111–133. <https://doi.org/10.1016/j.avb.2018.07.001>