Being a cybervictim and a cyberbully – The duality of cyberbullying: A meta-analysis

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1. Introduction

The introduction of information and communication technologies (ICT) into adolescents' everyday lives has allowed a new type of online violence to develop in secondary schools: cyberbullying. This phenomenon encompasses intentional, aggressive conduct carried out using ICT among peers (Smith et al., 2008). The ways in which such violence is performed vary and range from WhatsApp messages or degrading videos on platforms such as YouTube to offensive remarks on social networks (Garaigordobil, 2015). Cyberbullying is a highly relevant social phenomenon given the psychological consequences it may have for victims and bullies alike (Garaigordobil, 2011). It has thus become an enormous challenge that educational communities, with support from their administrations, are attempting to eradicate by means of innovative education projects. The high prevalence of cyberbullying on social networks, along with the absence of a clearly delimited spatiotemporal framework and the lack of adult supervision, poses a formidable challenge given the very nature of the Internet. Measurement of the incidence of this phenomenon fundamentally depends on the instrument employed to study it (Cross et al., 2015; Romera et al., 2016; Selkie et al., 2016 and Zych et al., 2016). The data vary enormously, with the estimates of incidence ranging from 6.5% (Ybarra & Mitchell, 2004) to 72% (Juvonen & Gross, 2008), as indicated by Quintana-Orts & Rey (2018). Indeed, it has been observed that prevalence indices can even vary within the same country (see Table 1). A meta-analysis on this phenomenon among adolescents conducted by (Modecki et al., 2014) showed that 36% were victims and 35% were bullies. Considerable diversity is evident depending on the underlying nation and culture. The ecological model of the risks of cyberbullying and cybervictimization (Bronfenbrenner, 1979) states that cultural norms, societal responses, and protecting issues (i.e., the macrosystem) are the first level to consider. The meta-analysis conducted by Baldry et al. (2015) exposes the importance of the macrosystem, which can promote or inhibit cyberbullying. However, Baldry et al. (2015) encourage further research on the relationship between the macrosystem and cyberbullying. A recent meta-analysis

conducted by Chen et al. (2017) exposes social norms as a significant variable (Q = 82.62, p <0.001) among predictors of cyberbullying perpetration. Chen et al. (2017) also argue that there are cultural differences between Asia-Pacific, Europe, and North America (Q = 100.76, p <0.001) in parental interaction with cyberbullies. Cultural differences can even moderate classical personality variables. The meta-analysis conducted by Lei et al. (2019) reveals that the role of self-esteem in cyberbullying varies by region. The cultures of America (Q = −3.446, p <.001), Asia (Q = −7.223, p <.0001) and Europe (Q = −4.027, p <.0001) yielded significant results, but Australia did not (Q = 1.624, p> 0.05; Lei et al., 2019). Similarly, the meta-analysis by Guo (2016) found differences in the correlation between externalizing problems and cybervictimization in different culture, including the United States (r = .28), Europe (r = .09), and other regions (i.e., Australia, Israel and Singapore; r = .23).

Table 1. Cyberbullying prevalence per nation.

Authors	Nations	Sample (age)	Prevalence
Ybarra & Mitchell (2004)	USA	1501 (10-17)	4% cybervictims 12% cyberbullies 3% cyberbully victims
Peskin et al., (2017)	USA	424 (11)	15% in a cyberdating situation
Del Rio et al. (2010)	South America	20941 (10-18)	12.1% cybervictims
Fahy et al., (2016)	England	2480 (12-13)	42.2% had participated in a cyberbullying situation 20.4% cybervictims
Brewer & Kerslake, (2015)	England	90 (17.11)	16.22% cybervictims 13.54% cyberbullies
Álvarez-García et al., (2017)	Spain	30.758 (14.01)	Prevalence varied enormously depending on the action carried out, but with low or very low values that come close to 2%
Larrañaga et al., (2018)	Spain	1062 (15.20)	8.2% cyberbullies among boys 5.1% cyberbullies among girls
Quintana-Orts & Rey, (2018)	Spain	1650 (14.1)	11.6% cyberbullies 16.0% cybervictims
Vale et al., (2018)	Portugal	627 (13.98)	72.2% had participated in a cyberbullying situation
Wong et al., (2014)	China	1917 (13.36)	16% of boys and 14.8% of girls had participated in cyberbullying in the last 30 days
Chen et al., (2019)	China	2120 (15.11)	12% had participated in doxxing situations
Lee & Shin, (2017)	South Korea	4000 (12-17)	6.3% cyberbullies 14.6% cybervictims 13.1% cyberbully victims

The age range within which cyberbullying is most frequently found is early to mid-adolescence, that is, between 12 and 15 years (Kowalski, Giumetti, Schroeder, & Lattaner, 2014 and Tokunaga, 2010). However, as Twardowska-Staszek et al. (2018) and Garaigordobil, (2015) report, cyberbullying can also be found in primary education, and the incidence figures increase in secondary education. Authors such as Calvete et al., (2010), Sakellariou et al., (2012), Ortega et al., (2009), Tokunaga, (2010) and Wang, Iannotti and Nansel (2009) indicate that students in mid-secondary education courses (aged 14-15 years) present the highest cyberbullying incidence, while the rate starts to decline among students in late secondary education courses (aged 17-18 years). Some authors postulate that cyberbullying decreases with age (Giménez Gualdo et al., 2015; Schneider et al., 2012 and Tokunaga, 2010); while others state the exact opposite (Del Rey et al., 2016; Festl et al., 2015; Hinduja & Patchin, 2013 and Tynes & Mitchell, 2014). There is also evidence of cyberbullying among university students (Kowalski, Giumetti, Schroeder, & Reece, 2012). DeSmet et al., (2018) assert that age is positively and significantly related to cybervictimization by means of sexual images (r=0.07, p<0.05) but not by means of embarrassing information or messages/posts. Conversely, other authors point out that age is not a predictor of cyberbullying (Bastiaensens et al., 2016; Bauman, 2010; Garaigordobil, 2015; Gofin & Avitzour, 2012; Larrañaga et al., 2018; Macháčková et al., 2013; Mark & Ratliffe, 2011; Monks et al., 2012; Ortega, R.; Calmaestra, J & Mora-Merchán, 2008; Perren & Gutzwiller-Helfenfinger, 2012; Slonje & Smith, 2008 and Walrave & Heirman, 2011). Like Cappadocia et al., (2013), we conclude that the literature on this subject offers very different age-related data. Just as the effect of the age variable in cyberbullying is inconsistent, so is that of sex (Garaigordobil, 2011). Many authors argue that it is not a statistically significant variable (Giménez Gualdo et al., 2015; Mishna et al., 2010 and Smith et al., 2008). Others argue quite the opposite and disagree over the role played by sex in cyberbullying among both boys and girls. Some argue that more males engage in cyberbullying situations (Álvarez-García, Barreiro-Collazo, and Nunez 2017; Buelga et al., 2015; Erdur-Baker, 2010; Kowalski & Limber, 2013; Ortega-Barón et al., 2017; Perren et al., 2012 and Slonje & Smith, 2008).

Others assert that females present higher levels of victimization (Giménez Gualdo et al., 2015; Ortega, Calmaestra & Mora-Merchán, 2008 and Ortega et al., 2009). Some research concludes that women present higher cyberbullying rates than men (Cullerton-Sen &

Crick, 2005; Holfeld & Grabe, 2012 and Navarro, 2016). Festl et al., (2017) argue that females' behaviours have a particular indirect nature that is linked with intimidation (false rumours or social exclusion), unlike males, who tend to employ direct forms of aggression, such as insults. Other interesting contributions to consider are the meta-analysis by Barlett & Coyne, (2014) and the research of Buelga et al., (2017), who contend that girls engage in cyberbullying at younger ages and employ indirect techniques, whereas boys engage in more of these behavioural actions in mid- to late adolescence.

Another relevant matter for debate is the question of whether adolescents can play a dual cyberbullying role by being both a bully and a victim at the same time and whether these situations have a high incidence (Hood & Duffy, 2018 and Meter & Bauman, 2018). In the literature, the prevalence rates for cyber-victims-bullies range between 3.3% (Renati et al., 2012) and 24.3% (Twardowska-Staszek et al., 2018), with prevalence peaking at mid-adolescence (Mishna, Khoury-Kassabri, Gadalla & Daciuk 2012). Twardowska-Staszek et al., (2018) indicate that 7.3% of cases occur as early as during primary education. However, Hood & Duffy, (2018) demonstrate that age is not a moderator variable. Although the sex data remain unclear, we generally observe that the likelihood of being a cyberbully-victim increases in girls (Kowalski & Limber, 2007 and Mishna et al., 2012). Nonetheless, some authors such as Yang & Salmivalli, (2013) do not coincide, and (Hood & Duffy, 2018) do not identify the sex variable as having a moderator effect. Apparently, the most relevant risk factor for participating in cyberbullying situations is having previously been a cybervictim (Hood & Duffy, 2018; Kowalski et al., 2014; Kwan & Skoric, 2013). Moreover, adolescents who present this duality report more adverse events, such as suicidal ideation (Holt et al., 2015), than pure cyberbullies or cybervictims (Kowalski & Limber, 2013), and they also have difficulties empathizing (Fanti & Kimonis, 2013). In fact, cybervictims-bullies present lower empathy levels than those of pure cyberbullies (Perren et al., 2012). Therefore, it is necessary to understand the situation that students are experiencing and its degree of incidence so that the education system is able to take appropriate action.

The main objective of this research is to determine the incidence among adolescents of being both a cybervictim and a cyberbully simultaneously. We also attempt to discern whether sex, age and culture act as moderators. This subject has been partially covered in

the literature, which indicates that the phenomenon exists, but its nature has not been studied in depth. Very few authors have centred their research on this duality, which occurs in both conventional bullying and cyberbullying.

Thus, the research questions we pose are as follows:

1. Can someone be a cybervictim and a cyberbully at the same time?
2. Do the moderator variables of sex, age, and culture have the effects on the cybervictim-bully phenomenon?
3. Does the cybervictim-bully phenomenon appear in all cultures?

2. Methods

The research register protocol was used in accordance with the Cochrane Manual of Systematic Reviews, as indicated in Higgins and Green (2011), the work by Botella and Gambara (2002) and PRISMA (2015). A series of inclusion criteria was agreed upon for performing the search of the literature:

- Sample age. The study population included adolescents with a mean age between 11.5 and 18 years.
- Methodological style of the articles. The study included only experimental and quantitative studies.
- Publication date. The articles were published from 2014 to 2019.
- Methodological rigour. Studies of acknowledged prestige and published in QI Index journals (Scimago Journal & Country Rank) were collected.
- Language. Priority was given to research works published in English, although those written in French and Spanish were also accepted.

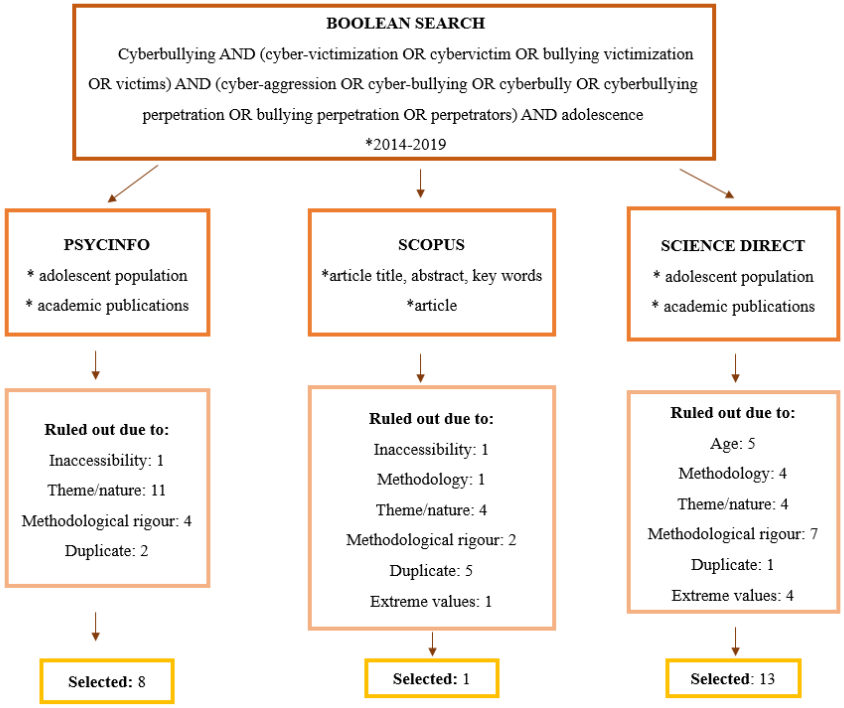
The adopted exclusion criteria were as follows:

- Adolescents with special education needs (SEN) as their main trait. Nonetheless, a decision was made to accept those research works carried out with students with SEN in which measures were standardized according to the normal curve.
- Research works that did not include clear and accurate quantitative data and those that the CMA software detected to have statistical errors.

The search strategy followed the parameters of Botella y Gambara (2002). The search for research works employed three databases: PsycINFO, Scopus and Science Direct. We have decided to choose these databases because they allow us to search for high impact international papers in the English language. They are also benchmarks in both psychology and educational science.The searches were carried out in March and April 2019. The successive search strategies indicated that the Boolean action that best covered the terminology required to answer the research question was "cyberbullying AND (cybervictimization OR cybervictim OR bullying victimization OR victims) AND (cyber-aggression OR cyber-bullying OR cyberbully OR cyberbullying perpetration OR bullying perpetration OR perpetrators) AND adolescence". These searches returned a large number of studies. By briefly tracking them, it was found that most did not study the correlation between being a cyberbully and a cybervictim using statistics. Most terms appeared in either the introductions or theoretical reviews of the studies. To limit the results, the following measures were taken. In Scopus, these terms had to appear: "article title, abstract, keywords" within the "article" research type. In PsycINFO, these terms had to appear: "adolescent population" and "academic publications". In Science Direct, these same terms had to appear in "abstracts or key words", and the results had to be "research articles". The 2014-2019 time period was set in all three search engines. The bibliography of the articles that appeared was reviewed, and the research works that met the inclusion criteria were included. However, five studies were removed from the sample during data processing for presenting extreme data values, although the studies were considered for the discussion. The meta-analysis included 22 studies with k=27 samples in Europe, Asia, Oceania and America.

Figure 1.

Flow chart of the search process and the selection of studies



Note: An additional article was added from the bibliographic search.

Studies were selected for this research by following the Cochrane Manual of Systematic Reviews, as indicated in Higgins and Green (2011); the manual outlines the criteria for selecting study samples. The selected studies were coded manually, as most did not explicitly refer to the considered variables. A decision was first made to code all terms into categories, as there was considerable diversity in the employed terminology. The cyberbully category included the terms cyber-aggression, cyber-bullying, cyberbully, cyberbullying perpetration, bullying perpetration, perpetrators and cyberdating. The cybervictim category included the terms cybervictimization, cybervictim, bullying victimization and victims. These two categories constituted the variables studied in the articles. Then, all the articles returned by the databases were carefully read. The selection was made according to the aforementioned inclusion/exclusion criteria. The CMA statistical software was used to conduct this meta-analysis; the software helped convert Fisher's Z-values to allow for the testing of publication bias (Egger et al., 1997), calculate statistics about heterogeneity and meta-regressions to compare models, and obtain figures such as the forest plot, funnel plot and Fisher's z meta-regression graphs. The employed data were mainly from Pearson's correlation tables, which represented 76.66% of all cases, followed by odds ratio data and chi-squared (Xi^2) data from 13.33% and 10% of the included studies, respectively.

Although an inclusion criterion was added about methodological rigour, the following procedures to guarantee rigorous data were considered necessary. First, the possibility of publication bias was determined. Consequently, checks were carried out automatically by the CMA software to ensure that the data did not produce errors. Extreme data values were removed, and Egger's regression testing was performed, while statistics related to heterogeneity were studied. Data diversity meant having to convert all values into Fisher's values, which allowed extreme values to be identified. It is necessary to point out that the initial sample size decreased because some studies included extreme values, i.e., Fisher's $Z > 1$ (Brewer & Kerslake, 2015; Sari & Camadan, 2016) or showed Fisher's $Z < 0.2$ (Chen et al.,b 2019; Fahy et al.,c 2016; and Twardowska-Staszek et al., 2018). It is worth noting that although conversion to Fisher's Z-values is an accepted meta-analysis methodology (Martin-Andrés & Luna del Castillo, 2004), it is not risk-free. This is because the transformation of a normal curve into a Fisher curve distorts values (x>0.5) that move further away from mean values. As this transformation may account for the reliability of such data, they were removed despite the methodological and statistical rigour with which they were obtained. Following Cochrane, as indicated in Higgins, JPT. & Green (2011), the sample's heterogeneity was studied. As the Q statistic of DerSimonian & Laird, (2015) (Q=964.17, df=26, p<0.000) evidenced wide variability, the homogeneity hypothesis was rejected. Therefore, it was necessary to take the statistics of I^2=97.305%, which indicated the percentage of variability due to heterogeneity and not to randomness. In this case, heterogeneity was very high (Higgins et al., 2003). Therefore, the random model, or the random effects model, was used (Martin-Andrés & Luna del Castillo, 2004). In line with Botella and Sánchez (2015) and with Botella & Gambara (2002), Egger's testing was used to verify the non-existence of publication bias. No significance was found in either tail (*p-value 1-tailed*=0.40; *p-value 2-tailed*=0.81), which indicated that no bias existed (Egger et al., 1997) (see Table 3), and the standard error was not high (3.28). As a result, the model came close to being a linear regression, which reasserted that no publication bias existed (Martin-Andrés, A. & Luna del Castillo, 2004). The effect size was calculated with the data expressed as Pearson's correlations, odds ratios and Xi^2. They were input into the CMA statistical software, which gave an effect size of r=0.428. Consistent with Cohen (1988) a positive and significant moderate correlation (p<0.001) was found between both the studied variables.

Table 2.

Heterogeneity statistics

Model	Effect size and 95% interval			Test of null (2-Tailed)		Heterogeneity				Tau-squared		
Model	Point estimate	Lower limit	Upper limit	Z-value	P- value	Q-value	Df (Q)	P-value	I-squared	Tau squared	Standard Error	Variance
Fixed	0.437	0.428	0.428	83.425	0.000	964.17	26	0.000	97.305	0.031	0.011	0.000
Random	0.428	0.371	0.483	13.076	0.00							

Table 3.

Egger's regression test

Intercept	-0.78996
Standard error	3.28832
95% lower limit (2-tailed)	-7.56239
95% upper limit (2-tailed)	5.98247
t-value	0.24023
Df	25.00000
P-value (1-tailed)	0.40605
P-value (2-tailed)	0.81211

3. Results

3.1 Demographic description

The search of the recent (2014-2019) literature on individuals being both a cyberbully and a cybervictim returned interesting results. A total sample with 47,836 individuals was obtained from 27 samples (*K*=27) collected in 22 studies. The study sample sizes ranged from 175 to 4,000. The social anthropology literature makes clear that it is necessary to consider human cultural diversity (Molano L., 2007). Therefore, the individuals in the sample were categorized in the following cultural groups: Asian, with 30.27% of the sample (S Korea and China); North American, with 7.52% (USA); South American, with 4.03% (Colombia); Central European, with 27.11% (Belgium, England); European Mediterranean, with 23.19% (Spain, Portugal and Cyprus); and Oceanian, with 0.36% (Australia and New Zealand). Regarding sex, it is noteworthy that one study provided no data about this variable. Of the whole sample, 41.03% were male and 41.11% were female. In regard to age, four of the studies did not indicate a mean age but rather an age range. In this case, an arithmetic mean was taken to calculate the collective mean age, which was 13.68 years.

Some of the researches that make up the sample are longitudinal, cross-sectional or

comparative studies of different cultures and nations. To address this diversity, the number of participating samples in each study (Nu) was chosen to be set apart from the population of each sample (Np). This occurs in the following studies: Romera et al., (2017), Charalampous et al., (2018), Pabian & Vandebosch (2016), Fahy et al., (2016) and Chu et al., (2018). On the other hand, it is necessary to expose how Romera et al., (2017) compares Spanish and Colombian sample. Being different cultures we have chosen to separate them, and consequently they appear twice.

Table 4.

Sociodemographic data

Authors	N p	N u	Age	N ma	N fe	Country	Culture	Distribution of participants
Hill et al. (2017)	1042	1	15,09	459	583	USA	North American	Multiple public high schools in diverse metropolitan regions
Cho et al. (2019)	2560	1	13,11	1277	1283	USA	North American	Health behaviour in school-aged children (HBSC) in the United States
Romera et al. (2017)	1931	1	10-19	906	1025	Colombia	South American	Public/private and rural/urban schools from the south of Colombia
Quintana-Orts & Rey (2018)	1650	1	14.10	825	840	Spain	Mediterranean	Six public secondary schools in the city of Málaga (Spain)
Álvarez-García et al. (2018)	3059	1	14.01	1575	1484	Spain	Mediterranean	Asturias region (Spain)
Larrañaga et al. (2018)	1062	1	15.20	488	574	Spain	Mediterranean	Castilla-La Mancha region (Spain)
Romera et al. (2017)	1899	2	14.92	968	931	Spain	Mediterranean	Public/privates and rural/urban schools from the south of Spain
Buelga et al. (2017)	1062	1	14.50	573	489	Spain	Mediterranean	Valencia region (Spain)
Vale et al. (2018)	627	1	13.98	283	344	Portugal	Mediterranean	State and private schools under the Portuguese DGE (General Directorate of Education)
Charalampous et al. (2018)	868	3	11.72	410	451	Cyprus	Mediterranean	Three different prefectures
DeSmet et al. (2018)	1037	1	12-18	521	516	Belgium	Central European	Flanders region (Belgium)
Erreygers et al. (2016)	2309	1	12.6	1223	1089	Belgium	Central European	Regional origin deleted in order to maintain the integrity of the review process
Pabian & Vandebosch (2016)	2333	2	13.02	1013	1320	Belgium	Central European	No information
Fahy et al. (2016)	2480	2	12-13	?	?	England	Central European	East London (England)

You & Lim (2016)	3449	1	13.78	1725	1724	S Korea	Asian	Nationally representative sample
Lee & Shin (2017)	4000	1	12-17	2000	2000	S Korea	Asian	Nationally representative sample
Park et al. (2014)	1200	1	12-15	615	585	S Korea	Asian	Nationally representative sample
Chu et al. (2018)	598	3	12.68	365	233	China	Asian	Wuhan city in central China
Wong et al. (2014)	1917	1	13.36	1046	871	China	Asian	Hong Kong (China)
Chen et al. (2019)	2120	1	15.11	1123	997	China	Asian	Hong Kong (China)
Hood & Duffy (2018)	175	1	14.82	83	92	Australia/ New Zealand	Oceanian	No information

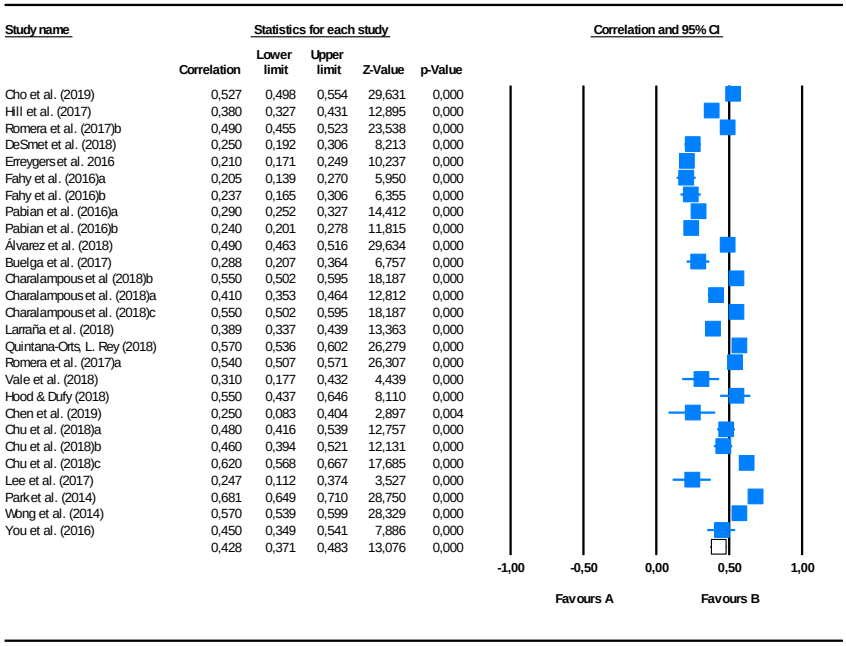
*N p (Number of participants); *N u (Number of samples); *N ma (Number of males) and *N fe (Number of females)

The aim of this study is to investigate the relation between the variables "cybervictim" and "cyberbully" using CMA software. A decision was made to transform the sample of correlation coefficients, odds ratios and Xi^2 values into Fisher's Z-values (Martin-Andrés & Luna del Castillo, 2004). Figure 2 (the forest plot graph) presents the sample size and the 95% confidence interval (0.371, 0.483) for the research works that found a relationship between the studied variables. The obtained effect size was moderate-high (r=0.428) (Cohen, 1988) and significant (p<0.01). All the data were highly significant (p<0.01), although only one study (Hill et al., 2017) fell within the confidence intervals. Two groups were formed: The first comprised those countries that did not reach the minimum value (mainly Central European countries, along with two Mediterranean and two Asian countries). The second was formed by those that exceeded the maximum limit (North American, South American, Oceanic countries and the other Mediterranean and Asian countries). The data on Central European cultures was noteworthy in its uniformity and disconnection from the rest of the data. The variability evidenced in the Q and I^2 statistics and the very wide confidence interval meant that the research works that we considered included extreme data values that considerably increased the standard deviation. Given this situation, the weight of each study was assumed by the random model or the random effects model (Martin-Andrés & Luna del Castillo, 2004). The funnel plot graph (Figure 3) underlines the previously noted variability and the diversity of the studies (Sterne et al., 2011), as the Egger's test also indicated. Three clear groups can be discerned: those on the left (7 with lower *Z-values*), those on the right (7 with higher *Z-values*) and those inside or on the edges of the cone. In the last case, we can see that some studies are in the middle of the structure but always inside it or at its edge; these studies present a higher standard error (Chen et al., 2019; Lee & Shin, 2017 & Vale et al.,

2018). In regard to the group of studies on the right, we must remember that the transformation they underwent was $x>0.5$ when the normal curve was converted into the Fisher curve, which moved these observations away from the mean values.

Figure 2.

Forest plot graph

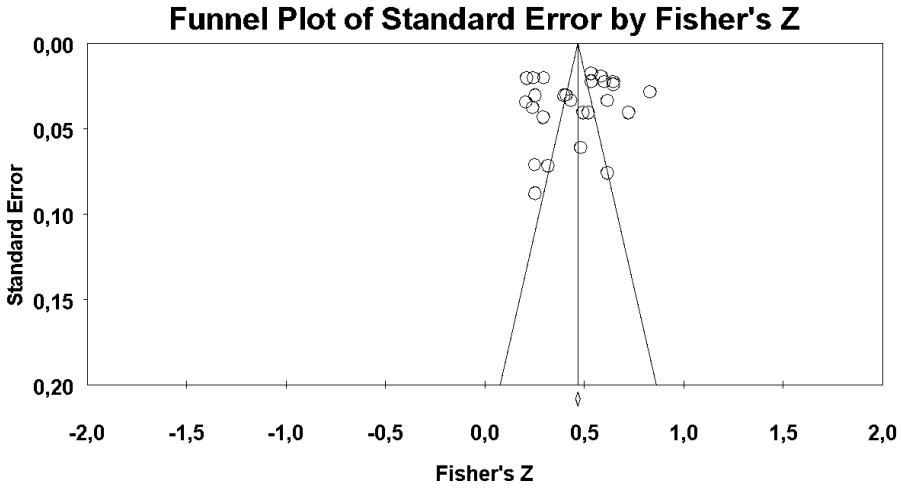


Study name	Correlation	Lower limit	Upper limit	Z-Value	p-Value
Cho et al. (2019)	0,527	0,498	0,554	29,631	0,000
Hill et al. (2017)	0,380	0,327	0,431	12,895	0,000
Romera et al. (2017)b	0,490	0,455	0,523	23,538	0,000
DeSmet et al. (2018)	0,250	0,192	0,306	8,213	0,000
Erreygers et al. 2016	0,210	0,171	0,249	10,237	0,000
Fahy et al. (2016)a	0,205	0,139	0,270	5,950	0,000
Fahy et al. (2016)b	0,237	0,165	0,306	6,355	0,000
Pabian et al. (2016)a	0,290	0,252	0,327	14,412	0,000
Pabian et al. (2016)b	0,240	0,201	0,278	11,815	0,000
Álvarez et al. (2018)	0,490	0,463	0,516	29,634	0,000
Buelga et al. (2017)	0,288	0,207	0,364	6,757	0,000
Charalampous et al (2018)b	0,550	0,502	0,595	18,187	0,000
Charalampous et al. (2018)a	0,410	0,353	0,464	12,812	0,000
Charalampous et al. (2018)c	0,550	0,502	0,595	18,187	0,000
Larrañа et al. (2018)	0,389	0,337	0,439	13,363	0,000
Quintana-Orts, L. Rey (2018)	0,570	0,536	0,602	26,279	0,000
Romera et al. (2017)a	0,540	0,507	0,571	26,307	0,000
Vale et al. (2018)	0,310	0,177	0,432	4,439	0,000
Hood & Dufy (2018)	0,550	0,437	0,646	8,110	0,000
Chen et al. (2019)	0,250	0,083	0,404	2,897	0,004
Chu et al. (2018)a	0,480	0,416	0,539	12,757	0,000
Chu et al. (2018)b	0,460	0,394	0,521	12,131	0,000
Chu et al. (2018)c	0,620	0,568	0,667	17,685	0,000
Lee et al. (2017)	0,247	0,112	0,374	3,527	0,000
Park et al. (2014)	0,681	0,649	0,710	28,750	0,000
Wong et al. (2014)	0,570	0,539	0,599	28,329	0,000
You et al. (2016)	0,450	0,349	0,541	7,886	0,000
	0,428	0,371	0,483	13,076	0,000

Meta Analysis

Figure 3.

Funnel plot graph



3.2 Moderator variables and meta-regression analysis

Because the existence of moderator factors (male sex, female sex, age and culture) could lead to wide variability in the results (Botella & Sánchez, 2015), it was necessary to test for such effects. A meta-regression test was used, and models were compared. Four moderator variables were established: male sex, female sex, mean age and culture (North American, South American, Central European, Mediterranean, Asian and Oceanic). The meta-regression (see Table 5) yielded five models: 1. simple, 2. male sex, 3. female sex, 4. age, and 5. culture. The first model, which included no moderator variable, did not help to explain any percentage of variance, and the same applied to model 2 (male sex) and model 4 (age). Although model 3 (female sex) explained 3% of the variance, these data were non-significant (p>0.05). Model 5 explained 66% of the variance (R^2=0.66), with a significance of p=0.0000 (p<0.01). However, the meta-regression (see Table 6 and Figure 4) allowed for a better analysis of the culture variables. The significance (p<0.05) and negative signs of the Central European culture, Mediterranean culture, Asian culture, North American culture and South America Culture coefficients indicated that adolescents within these cultures were more likely to become cybervictims-bullies. In other words, culture explained the data variability. Moreover, the heterogeneity displayed by the Q and I^2 statistics and the funnel plot graph was more easily interpretable in light of this cultural diversity.

Table 5.

Model comparison: Random effects (MM), Z-distribution, Fisher's Z

Model name	TauSq	R²	Q	df	p-value
'Model 1 SIMPLE	0.0314	0.00	0.00	0	1.0000
'Model 2 MALE	0.0318	0.00	2.90	1	0.0885
'Model 3 FEMALE	0.0305	0.03	3.04	1	0.0810
'Model 4 AGE	0.0258	0.00	0.21	1	0.6459
'Model 5 CULTURE	0.0107	0.66	33,35	5	0.0000

326 Table 6.

327 Meta-regression M.5

Meta-regression M.5									
Covariate	Coefficient	Standard Error	95%Lower	95%Upper	Z-value	2-sided p-value	Q	df	p
Intercept	0.8310	0.0972	0.6404	1.0216	8.55	0.000			
Asian Culture	-0.3214	0.1053	-0.5277	-0.1151	-3.05	**0.0023**			
Central European Culture	-0.5870	0.1050	-0.7928	-0.3812	-5.59	**0.0000**			
Mediterranean Culture	-0.3229	0.1207	-0.5243	-0.1215	-3.14	**0.0017**			
North American Culture	-0.3351	0.1187	-0.5678	-0.1024	-2.82	**0.0048**	50.53	6	0.000
Oceanian Culture	-0.2126	0.1564	-0.5155	0.0903	-1.38	0.1690			
South America Culture	-0.2949	0.1364	-0.5622	-0.0277	-2.16	**0.0306**			

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329 Figure 4.

330 Fisher's regression for culture variables

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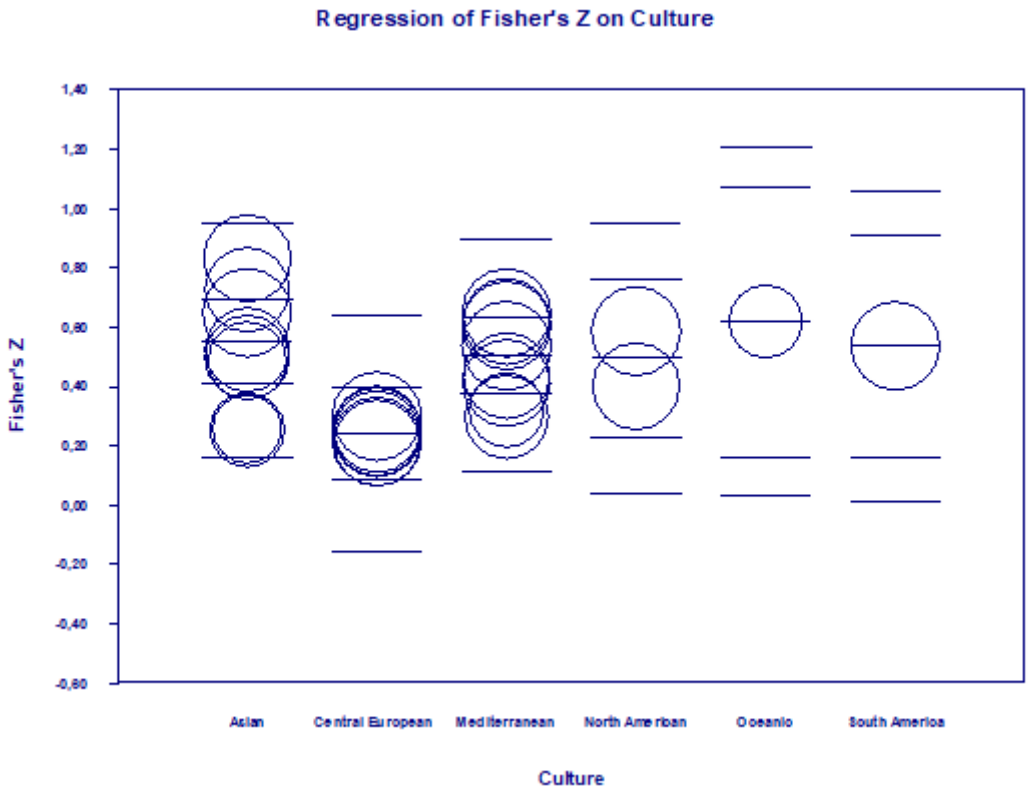

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4. Discussion

The studies herein employed agreed that a significant correlation appeared between being a cybervictim and a cyberbully, with a prevalence between moderate (r=0.205) (Fahy et al., 2016) and high (r=0.8) (Brewer & Kerslake, 2015). This diversity in the results corresponds to findings from other authors such as (Meter & Bauman, 2018).

Regarding sex, our results coincide with the works by Kowalski & Limber (2013) and (Mishna et al., 2012). Female sex explained 3% of the variance, unlike male sex, which explained none of the variance. Female sex had no effect according to the statistics, which is not in line with previous studies (Cullerton-Sen & Crick 2005; Holfeld & Grabe, 2012; Navarro, 2016).Nevertheless, it is worth stressing, in line with Hood & Duffy (2018), that sex was not a significant moderator variable. The theoretical review indicated that most articles did not directly deal with sex in their analysis of the cyberbully-victim group. Some authors did reported significant intergroup differences among individuals who had not been exposed to bullying, cyberbullies, cybervictims and cybervictims-bullies. However, they did not indicate which sex was more relevant in the study group. Buelga et al. (2017) and Hill et al. (2017) reported that the female sex was overrepresented among cybervictims-bullies, unlike Chen et al. (2019), Lee & Shin (2017), Twardowska-Staszek et al. (2018) and Vale et al. (2018), who indicated a higher proportion of males sex. Nonetheless, only Fahy et al. (2016) presented significant differences and revealed that the female sex was more prone to being in this group.

The meta-regression revealed that mean age did not explain any percentage of the variance. This finding is in line with (Buelga et al., 2017) and Hood & Duffy (2018). The theoretical review corroborated that most research works did not deal with age in the cybervictims-bullies group, while those that did provided contradictory views. Authors such as Vale et al. (2018) and Lee & Shin (2017) concluded that there were significant intergroup differences (i.e., among individuals not been exposed to bullying, cyberbullies, cybervictims, and cybervictim-bullies) but disagreed in regard to age ranges. Vale et al. (2018) argued that such problems emerge mainly at older ages, whereas Lee & Shin (2017) asserted that most issues appear in mid-adolescence. Twardowska-Staszek et al. (2018) reported a considerable increase in incidence from primary education to secondary education. It is worth stressing that although the targeted age range included the whole of adolescence (11.5-18.9 years) and the most common ages were 14 and 13, no mean ages beyond the age of 15 appeared in the sample, which significantly reduced the age range covered in this study.

The meta-regression indicated that culture explained 66% of the variance (p<0.0000). Indeed, Central European culture presented significantly negative values (t = −0.5870, p = 0.000), as did Mediterranean culture (t = −0.3229, p<0.0017), North American culture (t = −0.3351, p = 0.0048), South American culture (t = −0.2949, p<0.0306), and Asian culture (t = −0.3214, p = 0.0023). This suggests that adolescents from these nations were more likely to become cyberbully-victims, unlike their counterparts in other cultural groups, such as Oceanian Culture, which displayed coefficient values that did not reach the level of significance (t = −0.2126, p = 0.1690). These results are consistent with previous studies by Guo (2016) and Lei et al. (2019), who have argued that cultural diversity in cyberbullying can be seen in cultures such as those of America, Europe, Asia, and Australia. Chen et al. (2017) revealed cultural differences in social norms in Asia-Pacific, Europe, and North America cultures. Such differences help to explain the existence of different predictors for cyberbullying. In the words of Baldry et al. (2015), it is necessary to investigate the relationship between cyberbullying and the macrosystem (Bronfenbrenner, 1979).

First, it is necessary to determine how Oceania differs from other cultures. According to a recent meta-analysis by Jadambaa et al. (2019), the prevalence of cyberbullying victimization in Australia is 7.02% and that of cyberbullying perpetration is 3.45%. This research covers studies from 1990 to 2015 and offers a complete overview of this phenomenon in Australia. Jadambaa et al. (2019) recorded a decrease in the prevalence of traditional bullying and suggest that public awareness campaigns have been able to contribute to this reduction. They argued that the implementation of anti-bullying programs is an effective measure of mental health prevention. The meta-analysis by Baldry et al. (2015) does, however, report a series of variables that influence cyberbullying in Australia: low levels of self-esteem (Modecki et al., 2013), early depressed mood (Modecki et al., 2013), being a school bully, poor family management, and low parental support (Hemphill et al., 2015). Likewise, Hood and Duffy (2018) point out that moral disengagement (t = 2.184, p = 0.009) favors a cybervictim-bully relationship, while parental monitoring (t = −2.578, p = 0.011) decreases it. Other authors, such as Baldry et al. (2015), highlight the importance of monitoring adolescent Internet use. Family plays a determining role (Beringer, 2011; Cross & Barnes, 2014; Katz et al., 2014), and this variable has been introduced in anti-bullying intervention programs. The systematic review by Cantone et al. (2015) considers the efficacy of three Australian

intervention models: “Friendly schools” (Cross et al., 2010), which has moderate efficacy; “Creating a Peaceful School Learning Environment” (CAPSLE; Fonagy et al., 2009), which has high efficacy, especially for victims; and “CBT” (Berry & Hunt, 2009), which has moderate efficacy for bullying. All of these interventions included those affected and their families. The Cyber Friendly Schools (CFS) method developed by Cross et al. (2016) reduced both cyberbullying victimization and cyberbullying perpetration rates, although, in their suggestions for future lines of research, they demonstrated the need to incorporate the role of families.

One of today’s most innovative and successful strategies in school abuse is to intervene with all students, namely, victims, bullies and spectators, mainly before a cyberabuse situation arises. This method, called KiVa and developed at Turku University in Finland, it aims to develop collective norms. The observer plays the role of intermediary to improve coexistence. The method was established in 2006, and its efficiency has repeatedly been proven (Garandeau et al., 2014; Kärnä et al., 2013 & Saarento et al., 2015). It is being applied in many countries, such as the UK, one of the affected nations that is obtaining very positive results after the incorporation of the KiVa method in schools (Hutchings & Clarkson, 2015).

The systematic review of studies provided other interesting data about this group in victim-bully duality terms and about their individual differences and parents’ child-rearing styles. A priori, it is necessary to consider which of these two impacts starts first. The longitudinal research studies in our sample showed the awful situation faced by these adolescents. First, those who reported being cybervictims in the first survey waves were more likely to later become cyberbullies themselves. Quintana-Orts & Rey (2018) demonstrated that the most important factor for becoming a cyberbully was having previously been a cybervictim. The structural equations model of Pabian & Vandebosch, (2016) indicated that being a cybervictim in the first wave showed a relation with being a cyberbully in the second wave ($r=0.08$, $p<.05$). Chu et al. (2018) demonstrated that from the first wave to the third wave, this correlation between the two variables increased. Twardowska-Staszek et al. (2018) found a significant association (Xi^2) between conventional bullying and cyberbullying. Indeed, 11.6% of cyberbully-victims also reported experiencing conventional bullying. Suffering a cyberbullying situation and

inflicting such a situation on another person are not free of psychological consequences. Fahy et al. (2016) indicated that this group was twice as likely to suffer depression, 1.52 times more likely to have anxiety and 1.65 times more likely not to talk about the status of their own well-being; they also showed low social competence (Romera et al., 2017). Moreover, when less able to forgive, people are more likely (b=0.05, p<0.001) to become a cybervictim-bully (Quintana-Orts & Rey, 2018). These adolescents also displayed aggressive behaviour when they had to face objectives they disliked (Chen et al., 2019). The binary logistic regression by Vale et al. (2018) presented a series of behaviours that explained 71.1% of cyberbully-victim cases. These behaviours included publishing texts, images, videos, etc., on social networks or personal blogs, watching pornography and/or erotic websites and meeting up with people they had met over the Internet. That behaviours should be supervised by adults to avoid risky behaviours. Family was another determining variable. Vale et al. (2018) showed that 52.7% of the families of adolescent cyberbully-victims displayed a laissez-faire parenting style (i.e., the families do not give rules to their children or correct them), followed by 44.4% that adopted a "permissive" style. Intergroup differences appeared among non-participants, cybervictims, cyberbullies and cybervictims-bullies. Most non-participating adolescents had families that displayed democratic parenting styles (40.3%). Buelga et al. (2017) underlined this perspective by showing how cybervictims-bully minors indicated more family conflicts, less cohesion, poor expression capacity and offensive communication with their parents (with a very significantly high value compared to those of their counterparts). Therefore, these authors concluded that the affected adolescents had dysfunctional families. The importance of the family was measured by Hood & Duffy (2018), who indicated that parental control is a moderator variable that lowers the likelihood of becoming a cyberbully-victim. Garcia-Guilabert (2017) argued that families act as guardians; that is, they ensure that new technologies are properly used, an aspect also studied by Kowalski et al., (2014). These authors also indicated that Internet use increased the likelihood of becoming a cyberbully-victim. These results coincide with the longitudinal study by Gámez-Guadix et al., (2013), who found a positive and significant correlation between cybervictimization and excessive Internet use.

5. Conclusion

The overall findings show that the longitudinal studies have revealed that these students experience dramatic situations in which they are first cybervictims who later become

cyberbullies. These subjects appear to show emotional problems, coupled with reduced social and forgiveness competences and aggressive conduct when they must face objectives they dislike, and are more prone to suffer from psychological disorders (depression and anxiety). This situation may be due to their families lacking stability (poor family expression and cohesion, serious communication problems). This goes hand in hand with a laissez-faire-type child-rearing style, in which clear limits or the behavioural patterns needed to regulate conduct are not established for adolescents. A lack of family rules may explain why these adolescents engage in dangerous acts similar to corruption of minors on the Internet. All of this could make them potential victims of sexual predators. In addition to these findings, we included meta-regression results that drew attention to the Central European, Mediterranean culture, North American, South America and Asian culture. The cultural diversity that we have identified shows the need to explore the importance of the macrosystem in the duality between being cyber-victim and cyber-bully. Cultural differences in terms of cultural norms, social responses, and protection issues are elements of the macrosystem that can promote or inhibit cyberbullying. A clear example of the importance of the macrosystem are the intervention measures carried out in Australia. For decades, this nation has implemented interventions in educational centers, with students, teachers, and family.

Individuals affected by this phenomenon often inhabit an absent family in which parents act as friends rather than as parents, and the immense space of the Internet, unlimited by spatiotemporal barriers. All this appears to imply that those who are already cybervictims will move towards cyberbullying themselves and will suffer all the psychological consequences that this duality implies. Thus, one conclusion to be drawn regards the urgent need to introduce programmes such as KiVa into our education systems to prevent and treat cyberbullying so that in the next few years, the moderator effect found by this meta-analysis neither increases nor becomes significant.

This study is not without its limitations, as the sample does not include an African population. It would also have been interesting to observe a better representation of Indo-European, Eastern European and Asian countries, because Asia was represented only by two countries, China and South Korea, while South East Asian and Middle Eastern countries were ignored. It is also necessary to further investigate the relation between

parenting styles and cybervictimization-bullying in adolescents and the individual differences in those who present this duality.

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