Differences in family climate and family communication among cyberbullies, cybervictims, and cyber bully-victims in adolescents

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Abstract

Scientific studies on family factors related to the main cyberbullying roles are still scarce. The present study analyzed family climate and parent-adolescent communication in the four roles involved in cyberbullying: cybervictims, cyberbullies, cyberbully-victims, and non-involved adolescents. The study had two main objectives: (1) to analyze the differences in family climate (cohesion and conflict) and communication patterns with the mother and father (open, avoidance, and offensive) among the four roles, controlling the variables sex and academic grade; and (2) to determine the predictive weight of these family variables in the roles involved in cyberbullying. A battery of instruments was applied to 1062 adolescents from 12 to 18 years old. The results revealed that the cyberbully-victim profile had the lowest quality family climate and family communication patterns. In addition, family conflict predicted the role of cyberbullies, and non-open communication with the mother and avoidant communication with the father predicted the role of cybervictim. Finally, these family variables together (conflict and non-open and avoidant communication) predicted the role of cyberbully-victim.

Keywords: Family climate, Parent-child communication, Cyberbully-victims, Cyberbullying, Adolescence

1. Introduction

Cyberbullying is defined as aggressive, repetitive, and deliberate behavior between peers, where one person or group uses electronic devices (electronic communication technologies) to abuse a victim who cannot easily defend him/herself (Aboujaoude, Savage, Starcevic, & Salame, 2015; Giumetti & Kowalski, 2016). The prevalence of cybervictimization and perpetration ranges between approximately 15% and 40% (Garaigordobil & Martínez-Valderrey, 2016; Kowalski, Giumetti, Schroeder, & Lattanner, 2014; Tanrikulu & Campbell, 2015; Tokunaga, 2010). In fact, studies on worldwide cyberbullying trends have produced widely varying results (rates as high as 72%, Juvoven & Gross, 2008, and as low as 6.5%, Ybarra & Mitchell, 2004), which makes it difficult to draw comparisons between surveys. This stark disparity may be attributed to the different conceptual foundations and methodologies used in these scientific studies (Buelga, Cava, Musitu, & Torralba, 2015; Festl, Vogelgesang, Scharkow, & Quandt, 2017). Furthermore, it is important to note that many of the reported behaviors do not necessarily imply cyberbullying/victimization, but rather other events that do not comply with all the bullying criteria (Antoniadou & Kokkinos, 2015).
It is still unclear whether cyberbullying/victimization is a subtype of traditional bullying (Olweus, 2013, following the criteria of intentionality, repetition, and power imbalance), or a variant of traditional bullying but with specific features (Slonje, Smith, & Frisen, 2013), or a completely distinct phenomenon from traditional bullying (Gradinger, Strohmeier, & Spiel, 2009). Regarding the latter position, Antoniadou and Kokkinos (2015) and Mishna, Khoury-Kassabri, Gadalla, and Daciuk (2012) propose that the characteristics of the new information and communication technologies (potential anonymity, pseudonymity, asynchronous communication, power, status equalization, and lack of supervision) make them a unique phenomenon that explains the high prevalence of bully-victims in cyberbullying/victimization. These conditions make it possible for the victim to counter-attack on the Internet and display behaviors that s/he would not dare to perform face-to-face.

A large number of adolescents seem to be involved in both cyber aggression and cyber victimization. However, compared to the large amount of previous research focused on the cybervictim and cyberbully roles (see Kowalski et al., 2014), few studies have examined adolescents who are both victims and perpetrators in the virtual environment (see Chang et al., 2013; Cuadrado-Gordillo & Fernández-Antelo, 2014; Kokkinos, Antoniadou, & Markos, 2014). In fact, some studies conclude that previous research has underestimated the proportion of perpetrator-victims in this area (Festl et al., 2017; SchultzeKrumbholz et al., 2015).

In Spain, in spite of the rapid growth of the field of cyberbullying and the increase in the number of articles published in the past decade (e.g. Zych, Ortega-Ruiz, & Marin-López, 2016), research on cyberbully/victims is still scarce. However, previous findings in this cultural context have emphasized the relevance of cyberbully-victims. For instance, studies have shown that approximately 15-18% of Spanish adolescents have been classified as cyberbully-victims (Cuadrado-Gordillo & Fernández-Antelo, 2014; Gámez-Guadix, Gini, & Calvete, 2015). Moreover, Romera, Cano, García-Fernández, and Ortega-Ruiz (2016) pointed out that cyberbully-victims make up the most frequent group. Likewise, in another Mediterranean country, Kokkinos et al. (2014) observed that the cyberbully-victim was the most common participant role among Greek students. Furthermore, in Canada, Mishna et al. (2012) found that 25% of adolescents are cyberbully-victims, the predominant role found in their study. In the Czech Republic, Bayraktar, Machackova, Dedkova, Cerna, and Sevcikova (2015) found that almost 20% of the students involved in cyberbullying abuse their peers and are abused by them. Moreover, in Germany, Festl et al. (2017), using an innovative approach to cyberbullying (Latent Transition Analysis), found a heavily victimized group (with mild perpetration) and a very small class of heavy perpetrator-victims with intensive and stable problematic behavior.

In spite of the relevance of this role and its implications for adolescents’ adjustment (Kokkinos et al., 2014), little is known about the sociodemographic characteristics of adolescents who are both cyberbullies and cybervictims. Therefore, the current study further explores the relationships among demographic characteristics of adolescents involved as cyberbully-victims.

In addition, research related to the risk and protection factors associated with cyberbullying has focused on individual and social variables, whereas studies that explore the importance of
family relationships are scarce and based on findings from traditional bullying literature. In this regard, empirical evidence has focused mainly on cyberbullies and cybervictims. The present study explores the role of family climate and parent-child communication in adolescent cyberbullies, cybervictims, cyberbully-victims, and non-involved adolescents.

1.1. Demographic characteristics of roles involved in cyberbullying

Most of the research on the prevalence of cyberbullying has focused on cyberbullies and cybervictims. Results have consistently shown that boys are more involved as cyberbullies (Katzer, Fetchenhauer, & Belschak, 2009; Ortega-Barón, Buelga, Cava, & Torralba, 2017; Schulze-Krumholz et al., 2015) and girls as cybervictims (Aboujaoude et al., 2015; Navarro, Serna, Martínez, & Ruiz-Oliva, 2013; Zych et al., 2016). However, findings from the few studies that have analyzed the prevalence of cyberbully-victims are contradictory. Whereas Mishna et al. (2012) reported a larger number of girls involved as cyberbully-victims, Cuadrado-Gordillo and Fernández-Antelo (2014) found a higher percentage of boys, and Bayraktar, Machackova, Dedkova, Cerna, and Sevcikova’ (2015) found no differences between the sexes.

With regard to age, various studies have observed a greater number of cyberbullying victims among pre-adolescents (elementary school) (Kokkinos, Antoniadou, Dalara, Koufogazou, & Papatziki, 2013; Mishna et al., 2012; Tanrikulu & Campbell, 2015). By contrast, older students (high school) seem to more frequently perform the roles of cyberbully (Buelga, Iranzo, Cava, & Torralba, 2015; Zych et al., 2016) and cyberbully-victim (Festl et al., 2017; Mishna et al., 2012). In their meta-analysis on the interaction between age and sex, Barlett and Coyne (2014) found significant differences in cyberbullying. Girls use cyberbullying at younger ages to inflict relational or indirect aggression, whereas boys increase these behaviors during mid-adolescence and late adolescence. Along these lines, Festl et al. (2017) confirmed that girls were commonly in the gossip group, whereas boys were more frequently the (more direct) insulting perpetrator-victims.

1.2. Family risk and protection factors linked to the different roles

The classic digital gap between digital natives and immigrants has been considerably reduced in recent years, but it still exists between parents and their adolescent children (Kokkinos, Antoniadou, Asdre, & Voulgaridou, 2016; Prote'geles, 2014). In Spain, many parents still do not have enough technological competence, and they find it difficult to understand their children's fascination with having fun and interacting almost continuously on the Internet (Buelga, 2016). Spain is the European country with the highest proportions of Internet access via smartphone (European Commission, 2015), which fosters adolescents' constant connection to the Internet. In fact, 70% of Spanish adolescents have a smartphone at the age of 12 (Prote'geles, 2014), and 98% at the age of 14 (Ditrendia Digital Marketing Trends, 2016). The almost generalized availability of these devices in such a young population reveals the importance of research designed to study the family factors linked to the misuse of ICTs.

Nevertheless, the limited findings on family variables in cyberbullying contrast with the abundant literature available on traditional bullying (see Lereya, Samara, & Wolke, 2013). Numerous studies on traditional bullying have consistently shown the existence of family...
protection and risk factors associated with the roles of bully and victim, such as family communication problems (Griffin & Gross, 2004; Martínez-Ferrer, Musitu, Murgui, & Amador, 2009; Sánchez, León, Martínez-Ferrer, & Moreno, 2015) and maladaptive parenting (Georgiou, Ioannou, & Stavrinides, 2016; Hong & Espelage, 2012; Pontzer, 2010). Moreover, the perception of a negative family climate, where there are communication problems, frequent conflicts, and low levels of involvement (Cava, Musitu, & Murgui, 2007; Lereya et al., 2013; Martínez-Ferrer, Moreno, Amador, & Orford, 2011), has been related to victims of bullying and the role of bully-victim (Estévez, Jiménez, & Moreno, 2010; Hoetger, Hazen, & Brank, 2015).

Family factors also seem to be strongly related to cyberbullying (Buelga, Martínez-Ferrer, & Musitu, 2016; Kokkinos et al., 2016; Navarro, Yubero, & Larrañaga, 2016). As Kokkinos et al. (2016) suggested, family factors appear to be linked to cyberbullying/ victimization because, contrary to traditional bullying, the problems occur outside the school context and, therefore, can have a weak connection to school-related variables (i.e. involvement in schoolwork, teacher support). Until now, the existing research on cyberbullying has mainly addressed cyberbullies (see Baldry, Farrington, & Sorrentino, 2015; Hemphill & Heerde, 2014), and more recently, cybervictims (see Larrañaga, Yubero, Ovejero, & Navarro, 2016; Ortega-Barón, Buelga, & Cava, 2016; Van Dijk et al., 2013) and cyberbully-victims (Bayraktar et al., 2015; Kokkinos et al., 2016; Romera et al., 2016).

Recent literature shows that family relationships characterized by a positive family climate and open and empathic parent-child communication act as protector factors against cybervictimization and cyberperpetration (Buelga et al., 2016; Cross et al., 2015; Fanti, Demetriou, & Hawa, 2012; Navarro, Ruiz-Oliva, et al., 2015; Ortega-Barón et al., 2016). By contrast, cyberbullies present dysfunctional family relationships characterized by poor emotional attachment to their parents (Hemphill & Heerde, 2014; Ybarra & Mitchell, 2004), a negative perception of parental support (Fanti et al., 2012), frequent family conflicts (Tanrikulu & Campbell, 2015), and negative communication patterns with their parents (Elgar et al., 2014). Furthermore, as Martínez-Herves, Kramer, and Hickey (2014) suggested, there is a significant positive correlation between worse family functioning and time spent online and being involved in cyberbullying, even after controlling for time spent online.

Likewise, family relationships of cybervictims, although less deteriorated than those of cyberbullies, have been found to be negative, with avoidant and conflictive communication patterns with their parents (Buelga et al., 2016; Larrañaga et al., 2016; Van Dijk et al., 2013). In this regard, Accordino and Accordino (2011) reported that family cohesion was negatively associated with cybervictimization. In fact, less family cohesion increases the probability of being the target of electronic bullying (Buelga et al., 2016; Makri-Botsari & Karagianni, 2014), and this experience of cybervictimization is prolonged in time (Gámez-Guadix et al., 2015; Van Dijk et al., 2013), due to the lack of social and family resources of these adolescents. In addition, positive parent-adolescent communication is associated with parents’ engagement in dialogue with adolescents about online risks, which is linked to low involvement in cyberbullying/cybervictimization (Mesch, 2009; Perren et al., 2012).
In the case of family relationships of cyberbully-victims, the empirical evidence available is still scarce. Previous studies on traditional bullying have shown that bully-victims, compared to other roles, present not only psychological symptoms (Kokkinos et al., 2014), but also behavioral and family adjustment problems (Keelan, Schenk, McNally, & Fremouw, 2014; Lereya et al., 2013; Salmivalli & Nieminen, 2002). Specifically, findings show that bully-victims come from harsher family environments with more adverse family backgrounds (Lereya et al., 2013). These results coincide with those found recently by Bayraktar et al. (2015) in one of the few existing studies on the family relationships of cyberbully-victims. These authors found that cyberbully-victims, compared to cyberbullies, cybervictims, and non-involved adolescents, have more psychosocial difficulties and worse parental attachment. Moreover, a study carried out by Kokkinos et al. (2016) showed that pre-adolescents who perceive less harmonious parenting (authoritarian and submissive parenting styles) are more frequently involved as cyberbullies, cybervictims, and cyberbully-victims.

1.3. The present study

In the extant literature, few scientific studies have addressed the family factors related to the main cyberbullying roles (bullies, victims) and included the profile of cyberbully-victims. Thus, the present study examined adolescents’ roles in cyberbullying. Taking into account previous studies on bullying and cyberbullying (e.g. SchultzeeKrumbholz et al., 2015), the following roles were expected to emerge: cyberbullies, cybervictims, cyberbully-victims, and non-involved. From this perspective, the first objective of this study was to identify and analyze the prevalence of the main roles involved in cyberbullying (cyberbullies, cybervictims, cyberbully-victims, and non-involved adolescents), taking sex and academic grade (age) into account in the analysis.

Furthermore, previous findings pointed out that family variables should be taken into account when examining adolescents’ involvement in both bullying and cyberbullying (Buelga et al., 2016; Festl et al., 2017; Kokkinos et al., 2016). However, little is known about the role of family climate and parent-adolescent communication in the different roles involved in cyberbullying (cybervictims, cyberbullies, cyberbully-victims, and non-involved). In the present study, we analyzed differences in the family climate (cohesion and conflict) and communication patterns with the mother and father (open, avoidant, and offensive), controlling the variables sex and academic grade. Based on previous studies indicating that negative family relations are related to involvement in bullying or cyberbullying as a perpetrator (SchultzeeKrumbholz et al., 2015), we expected that cyberbullies and cyberbully-victims, compared to cybervictims and non-involved adolescents, would obtain lower scores on family climate and present more problematic communication patterns with their parents. Finally, we analyzed the predictive weight of these family variables in the roles involved in cyberbullying. Along these lines, we hypothesized that family climate and negative communication would have greater weight in predicting the role of cyberbully-victim. This study may contribute to specifically advancing the knowledge about the family setting in the main roles involved in cyberbullying and, more specifically, the profile of cyberbully-victims. In addition, this study will provide information at the national level in Spain because there have been few studies on cyberbully-victims and, specifically, family factors related to this role.
Therefore, based on the literature review, we propose the following research hypotheses:

H1. Cyberbully-victims, compared to cyberbullies, cybervictims, and non-involved adolescents, will obtain lower scores on family climate and present more problematic communication patterns with their parents.

H2. Family climate and negative communication will have greater weight in predicting the role of cyberbully-victims.

2. Material and methods

2.1. Participants

Participants were selected using randomized cluster sampling. The unit (cluster) was the school -public and semi public Secondary Schools- in the Valencian region (Spain). The sample was also stratified by academic grade. Thus, based on these criteria, four schools (three public and one publicly-subsidized private school) were randomly selected in each of the 17 counties in the province of Valencia, representing 68 schools in all. The sample size -with a sampling error of ±3.4%, a confidence level of 95%, and p ¼ q ¼ 0.5, (N ¼ 190,773)- was estimated at 1061 students.

A total of 1068 adolescents participated in this study, six of whom were excluded for responding systematically in the same way to the scales. Finally, the sample was composed of 1062 adolescents (51.4% boys and 48.5% girls) between 12 and 18 years old (M ¼ 14.5; SD ¼ 1.62) who were students at four public secondary schools in the provinces of Valencia and Alicante. Of these adolescents, 44.8% were enrolled in the first cycle of Compulsory Secondary Education (CSE), (lower secondary), 39.5% were enrolled in the second cycle of CSE (upper secondary), and 15.7% were enrolled in Pre-university studies. Ethnicity distribution was 86.3% Spanish, 1% African, 10% Latin American, 2.4% European Union members, and 0.4% Asian, which was similar to the national average (Ministry of Education, Culture and Sport of the Spanish Government, 2014). The size of the sample of adolescents corresponded to the size of the group of students in Compulsory and Upper Secondary Education in the Valencian Community.

2.2. Measures

2.2.1. Cybervictimization

The Adolescent Victimization through Mobile Phone and Internet Scale (CYBVIC; Buelga, Cava, & Musitu, 2010) consists of 18 items rated on a 4-point Likert-type scale ranging from 1 (never) to 4 (always). The scale measures the adolescent's experience as a victim of cyberbullying through the mobile phone and the Internet in the past 12 months. The scale consists of two subscales: Mobile Phone Victimization (e.g. “Someone called me and hung up”); and Internet victimization (e.g. “Someone went into my private accounts, and I couldn't do anything about it”). The CFA using the maximum likelihood estimation method confirmed the fit of the proposed measurement model, $\chi^2 = 238.90, df = 124, p < 0.001, \text{CFI} = 0.93, \text{NNFI} = 0.91, \text{RMSEA} = 0.03, 90\% \text{CI} = [0.024, 0.035]$, and the internal consistency (Cronbach's alpha = 0.89).
2.2.2. Cyberbullying

The Cyberbullying Scale (CYB-AGRESS; Buelga & Pons, 2012) consists of 10 items rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (very often). The items evaluate one's involvement as the perpetrator in aggressive behaviors via the Internet (e.g. “I have entered someone else’s Messenger or private accounts without him/her being able to do anything about it”) and Mobile Phone (e.g. “I have insulted or ridiculed someone”) in the past 12 months. The CFA using the maximum likelihood estimation method confirmed the fit of the proposed measurement model, $SBc2 = 41.50$, df $= 32$, $p < 0.001$, $CFI = 0.98$, $NNFI = 0.98$, $RMSEA = 0.02$, $90\% CI [0.000, 0.030]$, and the internal consistency (Cronbach’s alpha $= 0.80$).

2.2.3. Family climate

The Family Environment Scale (FES; Spanish adaptation by Fernández-Ballesteros & Sierra, 1989) is composed of 90 true-false items measuring social and environmental characteristics of families. In the present study, the Relationship subscale was selected. It consists of 27 items that measure the adolescent’s perception of the quality of his/her family relationships by assessing three domains: Cohesion (e.g. “There is a strong feeling of togetherness in our family”); Expressiveness (e.g. “Family members often keep their feelings to themselves”); and Conflict (e.g., “We fight a lot in our family”). The CFA using the maximum likelihood estimation method confirmed the fit of the proposed measurement model, $SBc2 = 559.67$, df $= 32$, $p < 0.001$, $CFI = 0.93$, $NNFI = 0.92$, $RMSEA = 0.05$, $90\% CI [0.045, 0.054]$, and the internal consistency (Cronbach’s alpha $= 0.84$, $0.71$, and $0.86$ for cohesion, expressiveness, and conflict respectively).

2.2.4. Family communication

The Parent-Adolescent Communication Scale (PACS; Barnes & Olson, 1982; Spanish adaptation by Estévez, Musitu, & Herrero, 2005) is composed of 20 items rated on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). The items measure the adolescent’s perception of the communication with his/her father and mother separately. This scale has three subscales for the father and three for the mother: Openness in Father/Mother Communication (e.g., “I can discuss my beliefs with my mother/father without feeling restrained or embarrassed); Offensive Communication with Father/Mother (e.g. “S/he insults me when s/he is angry with me”); and Avoidant Communication with Father/Mother (e.g. “There are topics I avoid discussing with him/her”). The second order CFA using the maximum likelihood estimation method confirmed the fit of the proposed measurement model, $SBc2 = 545.30$, df $= 156$, $p < 0.001$, $CFI = 0.94$, $NNFI = 0.92$, $RMSEA = 0.04$, $90\% CI [0.000, 0.030]$. The Cronbach’s alpha reliability coefficients in this study were: 0.91 and 0.90 for openness communication with the mother and father, respectively; 0.72 and 0.74 for Offensive communication with the father and mother, respectively; and 0.66 and 0.67 for avoidance communication with the father and mother, respectively.
2.3. Procedure

After initial contact with the principals of the selected schools, an informative seminar was held for the teachers and administration to explain the research objectives and request the parent authorizations. Next, a letter describing the study was sent to the parents, instructing them to indicate in writing if they did not want their child to participate in the study (only 1% of the parents did so). Participants anonymously and voluntarily filled out the scales during a regular class period (55 min). Trained researchers administered the instruments to the adolescents during the school day, informing them at all times that their participation in the study was voluntary and anonymous. Regarding family communication, adolescents were asked to respond with the person they perceived as their mother or father during the past year in mind. If one parent was deceased, we did not consider the information. Students could refuse to answer if they found it difficult to do so. Their privacy was guaranteed, reducing any possible social desirability effects. This study was approved by The Ethics Committee of the University of Valencia (Protocol Number: H1456762885511).

2.4. Statistical analyses

In order to examine the construct validity of the scale, Confirmatory Factorial Analysis (CFA) using EQS (6.1) (Bentler, 1995) was performed. We used the Maximum Likelihood estimation method and the Satorra-Bentler scaled chi-square test for non-normal data (Yuan & Bentler, 2000). Moreover, we calculated the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI), where acceptable or good fit is indicated by values above 0.90 or 0.95, respectively. Root Mean Square Error of Approximation (RMSEA) values of 0.05 or less indicate good model fit (Hu & Bentler, 1998). Cronbach's alpha was also calculated. Factor loadings were assessed for statistical significance at the p < 0.01 level.

Next, statistical analyses were performed using the statistical package SPSS, version 23, and missing values were handled using the regression imputation method (Allison, 2001). First, descriptive analyses were carried out to examine the frequency of cyberbullying and cybervictimization behaviors. Family communication and family climate were fairly normally distributed; however, both the cyberbullying and cybervictimization scales were positively skewed (2.30 for cyberbullying and 1.88 for cybervictimization scales). This means that most adolescents did not exhibit high levels of the variables related to cyberbullying involvement, which is very common when analyzing maladjustment outcomes and, in particular, cyberbullying (e.g. Vazsonyi, Machackova, Sevcikova, Smahel, & Cerna, 2012). Next, Pearson correlation analysis was conducted to analyze the relationships among the study variables.

Then, a cluster analysis was performed with the variables “cybervictims” and “cyberbullies” to identify the emerging groups according to the adolescents' involvement in cyberbullying. On the one hand, previous studies have found four groups, coinciding with the roles found in traditional bullying - cyberbullies, cybervictims, cyberbully-victims, and non-involved- (e.g., Olweus, 2013). On the other hand, different profiles have been found when examining cyberbullying latent trajectories (e.g. Festl et al., 2017). Consequently, we conducted a cluster analysis to explore the groups that would emerge as a natural cluster. Before performing the cluster analysis, all the measures were standardized. In order to avoid clusters with few adolescents, we assigned adolescents scoring below -2.5 standard deviations on these
measures a value of -2.5, and adolescents scoring over 2.5 standard deviations a value of 2.5. Next, hierarchical cluster analysis was performed using Ward’s method, with squared Euclidean distances as the similarity measure. To determine the optimal number of clusters, we examined the percentage change in the agglomeration coefficients, and we analyzed the dendrogram. Second, a k-mean cluster analysis was carried out to classify adolescents into four groups (cyberbullies, cybervictims, cyberbullyvictims, and non-involved). Due to the nature of cyberbullying, repetition may be hard to assess. As suggested in previous studies (see Perren, Dooley, Shaw, & Cross, 2010), no established cut-offs for being a cyberbully or cybervictim were calculated.

Next, several ANCOVAs were conducted to examine the differences among the cluster groups on the selected family setting variables, such as openness in communication with Father/Mother, communication problems with Father/Mother, cohesion, expressiveness, and conflict, using gender and academic grade level as covariates. Post-hoc tests were applied using the Bonferroni procedure to determine which variables showed differences between the groups. Eta-squared was used as an effect-size measure accompanying the ANCOVA analysis.

Finally, a multinomial regression analysis was carried out to determine the impact of family variables, gender, and academic grade on the cluster groups. Odds ratios with a 95% confidence interval were computed through regression analysis to establish which variables were more associated with cyberbullies, cybervictims, and cyberbully-victims.

3. Results

3.1. Descriptive analyses

3.1.1. Frequency of cyberbullying and cybervictimization behaviors

In the case of Cyberbullying, results showed that insulting or ridiculing someone was the most frequent Cyberbullying behavior (M ¼ 1.54, SD ¼ 0.74), whereas forcing someone to do things he/she did not want to do by using threats was the least frequent Cyberbullying behavior (M ¼ 1.11, SD ¼ 0.39). As for Cybervictimization, results indicated that receiving missed calls through mobile devices (M ¼ 1.54, SD ¼ 0.74) was the most frequently reported Cybervictimization, whereas the least frequent behavior was “being forced to do things I did not want to do by using threats” (M ¼ 1.07, SD ¼ 0.28). Even when the most frequently reported behaviors occurred almost never and a few times (one or twice), we included all the students in further analyses because any cyberaggression is potentially as harmful as repeated aggressive acts of violence (Modecki, Barber, & Vernon, 2013; Runions, Bak, & Cross, 2016).

3.1.2. Correlations among cyberbullying, cybervictimization, family climate, and parent-child communication

Before performing the cluster analysis, we first computed a zero-order correlation among all the variables. As Table 1 shows, cyberbullying and cybervictimization were significantly and positively related to family conflict, offensive communication with father and mother, and avoidant communication with mother and father. Cyberbullying and cybervictimization were negatively associated with cohesion, expressiveness, and open communication with the father.
and mother. Finally, family conflict was also positively correlated with cyberbullying, but not with cybervictimization.

3.2. Cluster analysis

We performed a cluster analysis in two phases. First, we conducted a hierarchical cluster analysis using Ward's method with squared Euclidean Distance to determine the initial number of clusters. The solution and the hierarchical cluster dendograms indicated a four-cluster solution supported by theoretical bullying and cyberbullying groups. Second, a k-means cluster analysis was carried out to classify the participants into four groups. Based on the adolescents' involvement in cyberbullying and cybervictimization, four clusters emerged: non-involved (N = 465; 43.78%), cyberbullies (N = 300; 28.24%), cybervictims (N = 99; 9.32%), and cyberbully-victims (N = 198; 18.64%). These groups coincided with previous studies in Spanish contexts (see Cuadrado-Gordillo & Fernández-Antelo, 2014; Gámez-Guadix et al., 2015).

Next, we examined whether the groups were similar in terms of demographic variables. As Table 2 shows, the groups were equivalent in terms of academic grade and type of family. Regarding gender, significant differences were found between clusters. Boys were overrepresented in the cluster groups of non-involved adolescents and cyberbullies, whereas girls were overrepresented in the cyberbully-victim group. Finally, the percentages of boys and girls were similar in the cybervictim group.

3.3. Differences in family relationships according to adolescents’ involvement in cyberbullying

Several Analyses of Covariance (ANCOVA) were carried out to test the differences among the cluster groups of non-involved adolescents, cyberbullies, cybervictims, and cyberbully-victims in their family relationships -family climate and parent-adolescent
communication- using gender and academic grade as covariates. As Table 3 shows, there were significant differences among the cluster groups for all the family variables. Cyberbully-victims scored significantly higher on family conflict than cybervictims and non-involved students. Cyberbully-victims also had significantly higher scores than the other groups on offensive communication with the mother and father, higher scores than the non-involved group on avoidant communication with the mother and father, and higher scores than cyberbullies on avoidant communication with the father. On the other hand, cyberbully-victims scored the lowest on family cohesion and expressiveness. The non-involved group reported the highest levels of open communication with the mother and father.

3.4. Family predictors of involvement in cyberbullying

Multinomial regression was performed to determine the effects of gender, academic grade, family climate (cohesion, expressiveness, and conflict), and family communication (openness and offensiveness with mother and father) on the involvement roles in cyberbullying (none-involved, cyberbullies, cybervictims, and cyberbully-victims). The interaction between gender and academic grade was also examined. The non-involved group served as the reference group. Results showed that the regression model was statistically significant, c²(42) = 175.79, p < 0.001, e²LL = 2485.69, Nagelkerke R² = 0.17. As Table 4 reveals, adolescents in families with higher levels of conflict were 8.42 times more likely to become cyberbullies than the non-involved group. Furthermore, boys were more likely to be cyberbullies (Exp(B) = 2.37), compared to the non-involved group. However, in lower secondary, boys are less likely to be cyberbullies than girls. Adolescents who reported high levels of avoidant communication with the father and lower levels of open communication with the mother were more likely to be cybervictims (Exp(B) = 1.64 for open communication with the father and 0.61 for open communication with the mother) and cyberbully-victims (Exp(B) = 1.77 for open communication with the father and 0.41 for open communication with the mother). Cyberbully-victims were also more likely to report higher levels of family conflict (Exp(B) = 2.67) than non-involved students.

4. Discussion

There is very little literature about the family factors linked to the different roles involved in cyberbullying and, specifically, the profile of cyberbully-victim. Therefore, the main purpose of this study was to advance the knowledge in this research area by studying the relationships between some important family variables and the roles of cyberbully, cybervictim, cyberbully-victim, and non-involved.

The first aim of our study was to analyze the prevalence of cyberbullies, cybervictims, cyberbully-victims, and non-involved adolescents in a Spanish sample by examining gender and age. Our data revealed that more than half of the adolescents in the study are involved in cyberbullying, and 28.4% of the involved adolescents are cyberbullies, followed by cyberbully-victims (18.64%) and cybervictims (9.3%). The high prevalence of cyberbullies found in our study agrees with results obtained by Calvete et al. (2010), who found that 44 percent of Spanish adolescents had engaged in
### Table 3

Means, standard deviations, and differences on family climate and parent-child communication among non-involved, cyberbullies, cybervictims, and cyberbully-victims.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cluster groups</th>
<th>(\mu(1, 1062))</th>
<th>Post hoc comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-involved</td>
<td>Cyber bully</td>
<td>Other victim</td>
</tr>
<tr>
<td>Cohesion</td>
<td>1.81 (0.30)</td>
<td>1.71 (0.30)</td>
<td>1.74 (0.30)</td>
</tr>
<tr>
<td>Expressiveness</td>
<td>1.60 (0.11)</td>
<td>1.15 (0.12)</td>
<td>1.19 (0.12)</td>
</tr>
<tr>
<td>Conflict</td>
<td>1.28 (0.04)</td>
<td>1.31 (0.04)</td>
<td>1.29 (0.04)</td>
</tr>
<tr>
<td>OpenC Mother</td>
<td>3.56 (0.14)</td>
<td>3.58 (0.14)</td>
<td>3.64 (0.14)</td>
</tr>
<tr>
<td>Off Mother</td>
<td>1.72 (0.04)</td>
<td>1.86 (0.05)</td>
<td>1.77 (0.06)</td>
</tr>
<tr>
<td>AvoidC Mother</td>
<td>2.81 (0.07)</td>
<td>2.93 (0.07)</td>
<td>2.87 (0.09)</td>
</tr>
<tr>
<td>OpenC Father</td>
<td>3.64 (0.14)</td>
<td>3.41 (0.15)</td>
<td>3.38 (0.15)</td>
</tr>
<tr>
<td>Off Father</td>
<td>1.80 (0.04)</td>
<td>1.83 (0.04)</td>
<td>1.78 (0.08)</td>
</tr>
<tr>
<td>AvoidC Father</td>
<td>2.87 (0.07)</td>
<td>2.98 (0.07)</td>
<td>3.04 (0.09)</td>
</tr>
</tbody>
</table>

### Table 4

Multinomial logistic regression model predicting gender, academic degree, family climate, and parent-adolescent communication among cyberbullies, cybervictims, and cyberbully-victims.

<table>
<thead>
<tr>
<th>Group</th>
<th>Effect</th>
<th>(\beta)</th>
<th>SE</th>
<th>Wald</th>
<th>Exp((\beta))</th>
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<td>Cyberbullies</td>
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<td>1.38</td>
<td>11.02**</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>Gender()</td>
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<td>0.40</td>
<td>4.76*</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>AD1</td>
<td>0.46</td>
<td>0.35</td>
<td>1.79</td>
<td>1.59</td>
</tr>
<tr>
<td></td>
<td>AD2</td>
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<td>0.35</td>
<td>0.66</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>Gender x AD1</td>
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<td>6.88**</td>
<td>1.03</td>
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<td>Gender x AD2</td>
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<td>1.15</td>
<td>1.33</td>
</tr>
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<td>Cohesion</td>
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<td></td>
<td>Expressiveness</td>
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<td>1.23</td>
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</tr>
<tr>
<td></td>
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<td>0.14</td>
<td>0.06</td>
<td>0.99</td>
</tr>
<tr>
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<td>0.27</td>
<td>1.08</td>
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<tr>
<td></td>
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<td>0.15</td>
<td>0.79</td>
<td>1.14</td>
</tr>
<tr>
<td>Cybervictims</td>
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<td>2.00</td>
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<td>1.29</td>
</tr>
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<td>0.23</td>
<td>1.34</td>
</tr>
<tr>
<td></td>
<td>AD1</td>
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<td>1.34</td>
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<td>1.13</td>
</tr>
<tr>
<td></td>
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<td>1.31</td>
<td>1.13</td>
</tr>
<tr>
<td></td>
<td>Gender x AD2</td>
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<td>0.73</td>
<td>0.02</td>
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<tr>
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<td>0.71</td>
<td>0.00</td>
<td>1.01</td>
</tr>
<tr>
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<td>0.65</td>
<td>2.05</td>
<td>1.53</td>
</tr>
<tr>
<td></td>
<td>Conflict</td>
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<td>0.74</td>
<td>0.09</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
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<td>0.15</td>
<td>10.76**</td>
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<td>0.17</td>
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</tr>
<tr>
<td></td>
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<td>0.22</td>
<td>4.15*</td>
<td>1.64</td>
</tr>
<tr>
<td>Cyberbully-victims</td>
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<td>0.97</td>
<td>0.32</td>
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<tr>
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<td>AD1</td>
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<td>0.03</td>
<td>0.99</td>
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<tr>
<td></td>
<td>AD2</td>
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<td>0.71</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>Gender x AD1</td>
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<td>1.29</td>
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<tr>
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<tr>
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<td>0.01</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
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<td>0.12</td>
<td>33.87***</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>OpenC Father</td>
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<td>0.14</td>
<td>0.03</td>
<td>1.03</td>
</tr>
<tr>
<td></td>
<td>AvoidC Mother</td>
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<td>0.17</td>
<td>0.35</td>
<td>1.11</td>
</tr>
<tr>
<td></td>
<td>AvoidC Father</td>
<td>0.57</td>
<td>0.18</td>
<td>10.31**</td>
<td>2.37</td>
</tr>
</tbody>
</table>

\(p < 0.05; \quad \ast p < 0.01; \quad \ast\ast p < 0.001.\)

**Note:**
- a Non-involved was used as the normative group.
- b Gender (1): Males.
- c AD: Academic Degree; 1: First cycle; 2: Second cycle.
some type of cyberbullying. One possible explanation for this high incidence of cyberbullies in Spain is the almost generalized use of smartphones in the young population; 98% of 14-year-old Spanish adolescents have a smartphone (Ditrendia Digital Marketing Trends, 2016). This situation is combined with the fact that the virtual world has specific characteristics that seem to contribute to a greater expression of violent behaviors (Buelga et al., 2015; Kowalski et al., 2014; Zych et al., 2016).

Thus, disinhibition, de-individuation, invisibility, and anonymity in Internet (Dehue, Bolmon, & Vollink, 2008; Kokkinos et al., 2014; Schultze et al., 2015) may also explain the greater involvement of Spanish adolescents in cyberaggression behaviors, both as cyberbullies and as cyberbully-victims. Therefore, as Kokkinos et al. (2014) suggests, it is possible that, due to the online disinhibition effect, cybervictims may be empowered to engage in retaliatory attacks online. The Internet allows adolescents to hide their identity, which can explain the fact that this dual role is much more common in the virtual environment than in traditional bullying (Aboujaoude et al., 2015; Cuadrado-Gordillo & Fernández-Antelo, 2014; Gámez-Guadix et al., 2015; Garaigordobil & Martínez-Valderrey, 2016), where this profile is less frequent (Estévez et al., 2010; Navarro, Larrañaga & Yubero, 2015; Olweus, 2001).

These social and technological circumstances can explain the high percentage of cyberbully-victims and cyberbullies found in the present study, coinciding with previous studies (Cuadrado-Gordillo & Fernández-Antelo, 2014; Gamez-Guadix et al., 2015). In fact, Romera et al. (2016) observed that the cyberbully-victim was the prevalent role in the involvement in cybernetic violence. Moreover, authors such as Festl et al. (2017) and Schultze-Krumbholz et al. (2015) concluded that the proportion of perpetrator-victims has been underestimated in prior research.

Furthermore, regarding the relationship of gender and the roles, the results showed a larger percentage of boys in the group of cyberbullies and more girls among the cybervictims and cyberbully-victims. These gender differences agree with results obtained in previous studies showing that boys participate more as cyberbullies (Bayraktar et al., 2015; Fanti et al., 2012; Garaigordobil, 2016; Schultze-Krumbholz et al., 2015), and girls as cybervictims (Larrañaga et al., 2016; Mishna et al., 2012; Zych et al., 2016). Regarding the role of cyberbully-victims, our results coincide with those found by Hinduja and Patchin (2012) and Schultze-Krumbholz et al. (2015), who find a higher prevalence in girls. However, other authors have observed no differences between the sexes (Bayraktar et al., 2015), or they have even shown a greater participation of girls in this dual role (Cuadrado-Gordillo & Fernández-Antelo, 2014). Consequently, this interesting question requires more scientific studies to shed light on the inconsistent results found in the research on this dual role.

Regarding the main objective of our study, the results show that the family context plays an important role in cyberbullying behavior and, particularly, in cyberbully-victims. Our data reveal that this latter group perceives a negative family climate and has poor parent-child communication. Specifically, this profile perceives less cohesion and family expressiveness in their family climate than the other roles. In addition, in their communication patterns, cyberbully-victims present communication difficulties with the mother, as they perceive the communication to be offensive, closed, and not very empathic, and with the father, as they
perceive the communication to be offensive and that talking about certain controversial topics is avoided. These data support our first hypothesis and agree with previous studies reporting that cyberbully-victims present the most conflictive profile, with the greatest number of family problems and the worst parental ties (Bayraktar et al., 2015; Kokkinos et al., 2016). These findings also agree with traditional bullying, where the bully-victims, compared to the other roles, show the worst psychological and family adjustment (Duggins, Kuperminc, Henrich, Smalls-Glover, & Perilla, 2016; Kokkinos et al., 2014; Lereya et al., 2013).

Moreover, as expected, apart from the cyberbully-victims, another role that presents family problems is that of cyberbullies, who obtained high scores on family conflict. In previous studies, similar results were observed for the family environment of cyberbullies, suggesting the existence of a negative family climate with frequent discussions (Fanti et al., 2012; Hemphill & Heerde, 2014; Tanrikulu & Campbell, 2015) and offensive communication with their parents (Buelga et al., 2016; Elgar et al., 2014; Larrañaga et al., 2016). However, cybervictims, compared to the two previous roles, present more well-adjusted and less problematic family relationships. Thus, specifically, unlike cyberbully-victims, cybervictims rate their family climate (cohesion, expressiveness, and conflict) more positively, and they present less offensive communication with their parents.

Certainly, these family variables, family climate and family communication, have considerable weight in all these roles. Along these lines, the multinomial regression analysis performed in our study provides interesting results about the predictive weight of these family variables in the analyzed roles. Thus, the data suggest that adolescents who perceive less open communication with their mother and more avoidant communication with their father are more likely to become victimized. These findings agree with those obtained previously, and they are congruent with studies that have consistently shown that positive, open, and fluid communication with parents is associated with less cybervictimization (Appel, Stiglbauer, Batinic, & Holtz, 2014; Buelga et al., 2016; Cross et al., 2015; Fanti et al., 2012; Navarro, Larrañaga, et al., 2015; Ortega-Barón et al., 2016). Our results also coincide with the study by Larrañaga et al. (2016), who show that cybervictims present avoidant communication patterns with their parents. This absence and avoidance of communication with parents contributes to prolonging cybervictimization in time, due to a lack of social support from adults in resolving the bullying situation (Makri-Botsari & Karagianni, 2014; Ortega-Barón et al., 2016; Van Dijk et al., 2013).

In addition, also in consonance with our descriptive results, we observe that family conflict and the sex variable (being a boy) are predictors of the cyberbully profile. With regard to sex, our results are coherent, as mentioned above, with numerous studies suggesting that boys engage more in cyberaggressions than girls (Buelga et al., 2015; Kowalski et al., 2014; Ortega-Barón et al., 2017). However, we have also shown the existence of an interaction between sex and age, so that the probability of being a male aggressor is lower at younger ages. This result is congruent with the meta-analysis by Barlett and Coyne (2014). The authors conclude that the participation of male cyberbullies increases in mid and late adolescence and is lower at younger ages.
Regarding family conflict, this family variable undoubtedly predicts the role of cyberbully. This result agrees with previous research showing that conflictive family relationships are a family risk factor for cyberbullying (Buelga et al., 2016; Kowalski et al., 2014; Tanrikulu & Campbell, 2015), and other violent and antisocial behaviors (Barrett & McIntosh, 2015; Estévez et al., 2010; Yang & McLoyd, 2015).

Finally, and considering the family profile of cyberbully-victims, which has hardly been studied in the current research, it is quite interesting that participants identified as cyberbully-victims share the significant difficulties in the family context of both cyberbullies and cybervictims. Thus, our results reveal that the profile with the most dysfunctional family relationships is that of cyberbully-victim. This finding, which coincides with previous studies (Bayraktar et al., 2015; Kokkinos et al., 2016), supports our second hypothesis that family climate and negative communication will have greater weight in predicting the role of cyberbully-victims.

Furthermore, as expected, both family conflict, a variable that was shown to be significant in cyberbullies, and the perception of closed communication with the mother and avoidant communication with the father, relevant predictors of the cybervictim profile, predict the role of cyberbully-victim. Therefore, family conflict (Duggins et al., 2016; Hemphills et al., 2012) and open and avoidant family communication (Larrañaga et al., 2016; Ortega-Barón et al., 2016) seem to be key variables that should be studied more in depth in future studies.

In spite of the obvious contributions of our study, which sheds light on the family context of the profiles involved in cyberbullying, it is important to mention some limitations. First, as the study has a cross-sectional design, a longitudinal study would be needed to understand how the different cyberbullying roles can change over time depending on the weight of the family variables. Moreover, this longitudinal study could include other family variables, such as online parental supervision, that have not been utilized in the present study, but have been studied as risk factors in cyberbullying (Navarro et al., 2013; Sasson & Mesch, 2014). In addition, another limitation of the present study involves the possible effects of social desirability and bias in the adolescents' answers on the self-reports. Even so, the evaluation of violent behaviors through self-reports in adolescents is acceptable (Buelga & Pons, 2012; Navarro, Yubero, & Larra, 2016; Ortega-Barón et al., 2016). Moreover, due to the rapid and massive expansion of the use of smartphones in Spain since the year 2013 (European Commission, 2015), the cybervictimization scale that measures bullying through the mobile phone, on the one hand, and through the Internet, on the other, might repeat information because Spanish adolescents access the Internet through the smartphone. In fact, in response to these rapid technological changes, the authors of the present study are validating a new cybervictimization instrument that measures bullying behaviors through ICTs on one unique scale. It is also important to consider that relationships between family factors and cyberbullying involvement could also be reversed, so that the child's participation in cyberbullying behaviors can negatively affect the family climate and parent-child communication, rather than family factors fostering the child's violent cybernetic behavior. Therefore, future research could provide dyadic data from the parents, given that only the child's perspective was measured in the present study.
In summary, although our study presents some limitations, our results undoubtedly contribute to advancing the current research on the family factors linked to the different roles involved in the growing behavior of cyberbullying. Although numerous studies have examined the prevalence of cyberbullying and cybervictimization, research on the family correlates of cyberbullying in perpetrators and victims is scant. The present study contributes to the extant literature by examining family climate and parent-adolescent communication, factors hypothesized to be related to cyberbullies, cybervictims, and cyberbully-victims.

Specifically, this study contributes to better understanding cyberbully-victims, a numerous group with a particularly problematic family profile, as described above. The implications of these results reveal the need to include the family in cyberbullying intervention programs as a key variable in preventing and reducing the growing problems of cybernetic violence among children and adolescents. The family’s responsibility in the healthy use of the new space and communication technologies is absolutely necessary in our country, given that almost 100% of Spanish adolescents have latest generation smartphones at very early ages. Families must take responsibility for their children’s correct use of these devices because, as this study shows, positive family communication and a family climate characterized by warm involvement are key factors in preventing cyberbullying. Therefore, apart from children and adolescents, it is also important to involve parents in cyberbullying prevention programs in the school context. Parent classes can be held to work on protective family factors for the proper use of information and communication technologies by their children, who are exposed to a growing number of dangers in Internet.

References


