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Parenting styles, cyberaggression, and cybervictimization among adolescents

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Abstract

Social concern about the negative effects of cyberbullying in children and adolescents' psychosocial development is currently increasing. The importance of the family environment and factors in bullying has been highlighted, but little is known about the role of parenting styles in adolescents' engagement in cyberaggression and cybervictimization. The aim of this study was to analyze the relationships of parenting styles (authoritative, indulgent, authoritarian, and neglectful) and cyberbullying (cybervictimization and cyberaggression) in adolescents, also considering sex and age. Participants were 2399 Spanish adolescents, 50.2% boys, aged between 12 and 18 years old ($M_{age} = 14.69$, $SD_{age} = 1.82$). A multivariate analysis of variance (MANOVA, $4 \times 2 \times 2$) was performed, with parenting styles, sex, and age (12-14 years and 15-18 years) as independent variables and cybervictimization and cyberaggression as criteria. Possible interaction effects were also analyzed. Results showed main effects of parenting styles, sex, and age, as well as an interaction effect between sex and parenting styles. Girls suffered more cybervictimization than boys, whereas boys performed higher levels of cyberaggression than girls. Results suggested that authoritarian parenting style was a risk factor for cyberviolence. Girls from authoritarian families scored highest on cybervictimization. Boys from indulgent families were less involved in cybervictimization. These findings highlight the importance of establishing positive and open communication between parents and adolescents. The implications are discussed.

Keywords: parenting styles, cyberbullying, cybervictimization, adolescence

1. Introduction

In this study, we analyzed the relation between parenting styles and cyberbullying in adolescence. More specifically, we examined the association of four parenting styles — authoritarian, neglectful, authoritative, and indulgent—with cybervictimization and cyberaggression, as a function of adolescents' sex and age.

In the last decade, cyberbullying has emerged as a new form of violence among adolescents. Cyberbullying is the use of electronic or digital means to harass, threaten, embarrass, or target another person repeatedly with the intention of causing harm to a victim who has difficulties defending him- or herself (Smith et al., 2008; Tokunaga, 2010; Ybarra & Mitchell, 2004). Cyberaggression and cybervictimization are distinguished, respectively, depending on whether this type of violent behavior is performed or suffered (Corcoran, McGuckin, & Prentice, 2015).

In contrast to school bullying, cyberbullying continues beyond the classroom and class schedules because it does not require a physical space in which to be performed, it allows the bully's anonymity, and is difficult for adults to detect (Álvarez-García, Barreiro-Collazo, & Núñez, 2017). These aspects, along with the negative consequences of cyberbullying in adolescents' psychosocial development, justify its investigation.

2. Parenting styles and cyberbullying

Research on cyberaggression and cybervictimization is still incipient, especially regarding parenting styles and taking into account the typology proposed by Maccoby and Martin (1983). In these authors' theoretical model, the dimensions of strictness/imposition and warmth/affection are considered theoretically independent, forming four main parenting styles (Darling & Steinberg, 1993; Maccoby & Martin, 1983; Martínez, Cruise, García, & Murgui, 2017), as described below.

The authoritarian style is characterized by parents' high levels of strictness/imposition and low levels of warmth. The indulgent style is defined by low strictness/imposition and high warmth. The authoritative parenting style has high levels of strictness/imposition and warmth. Lastly, the

neglectful style is determined by low levels of parental strictness and warmth (Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994).

Prior research has confirmed that some variables corresponding to parental socialization style dimensions—such as warmth, affection, parental supervision, and strictness—are related to cybervictimization and cyberaggression in adolescents (i.e., Appel, Stiglbauer, Batinic, & Holtz, 2014; Kowalski, Limber, & Agatson, 2012; Makri-Botsari & Karagianni, 2014; Ortega-Barón, Buelga, & Cava, 2016; Ybarra & Mitchell, 2004).

2.1. Cyberbullying and affection

Affection is an important protective factor against children's online and offline participation in violent behavior, as it promotes a greater feeling of self-confidence and strengthens the emotional parent-child bond through positive, open, and empathic communication (Appel et al., 2014; Martínez, Murgui, García, & Garcia, 2019; Moreno, 2013; Solecki, McLaughli, & Goldschmidt, 2014).

More specifically, open parent-child communication has been considered an important resource that alerts adolescents about the opportunities, risks, and scope of their behaviors in the virtual setting (Appel et al., 2014; Solecki et al., 2014). In fact, spontaneous parent-child communication about adolescents' Internet activities decreases the probability of their involvement in cybernetic violence and victimization (Law, Shapka, & Olson, 2010; Stattin & Kerr, 2000).

In contrast, low affection, characterized by negative, hurtful, or defiant communication among family members, can trigger violent interactions and cyberbullying in social networks through the use of offensive language, hatred, and anger towards others (Jones, Mitchell, & Finkelhor, 2013; Kowalski et al., 2012; Lwin, Li, & Ang, 2012; Martínez et al., 2019; Tokunaga, 2010).

2.2. Cyberbullying, parental supervision, and strictness

Besides open communication and affective bonds, factors related to parental control of adolescents' behavior play a relevant role in cyberbullying. For example, families characterized by excessively harsh discipline, with little democratic interaction and excessive use of punishment—typical of the authoritarian parenting style—, and low supervision of the adolescent in online environments—a main characteristic of the neglectful parenting style—are related to a greater likelihood of adolescent involvement in cyberbullying (Accordino & Accordino, 2011; Buelga, Martínez-Ferrer, & Cava, 2017; Kokkinos, 2013; Kowalski, Giumetti, Schroeder, & Lattanner, 2014; Makri-Botsari & Karagianni, 2014; Martínez et al., 2019; Ybarra & Mitchell, 2004). Some adolescents involved in cyberbullying do not inform their parents about it for fear of punishment and the negative consequences they may suffer (Mehari et al., 2018). The authoritarian parenting style has also been associated with more cybervictimization in adolescence (Martínez et al., 2019).

Parental supervision of children's online behavior (parental mediation) has been considered a protective factor, especially in early childhood and adolescence, reducing the risk of adopting the roles of cyberbully and cybervictim (Giménez, Luengo, & Bartrina, 2017; Lwin, Stanaland, & Miyazaki, 2008; Navarro, Serna, Martínez, & Ruiz-Oliva, 2013). In contrast, low parental supervision of children's online activities is related to a greater risk of participating in cyberbullying (Buelga, Iranzo, Cava, & Torralba, 2015; Kowalski et al., 2014) and suffering cybervictimization (Aoyama, Utsumi, & Hasegawa, 2012; Low & Espelage, 2013).

Nevertheless, other studies have indicated that positive family communication is more effective than parental supervision of online activities (Buelga, Martínez, & Musitu, 2016; Law et al., 2010). This may be related to parents' regulation of their children's behavior, either through an authoritative approach, using high but reasoned control, or through an indulgent style, with low strictness that guides the adolescent's behavior by means of affection and positive communication. In fact, Lwin, Stanaland, and Miyazaki (2008) noted that restrictive control of children's access to Internet is not effective across all the stages of childhood and adolescence; on the contrary, this strategy does not seem to be successful in middle and late adolescence (ages 15 to 17). During these

stages, positive communication appears to be more effective for behavioral control in the specific area of digital media (Buelga et al., 2016, Lwin et al., 2008).

2.3. Cyberbullying, sex, and age

An important deficit in our comprehension of the relations between cyberaggression, cybervictimization, sex, and age can be observed in the scientific literature. With regard to sex, very heterogeneous results have been found, with some works concluding that girls are cybervictimized more frequently than boys (Buelga, Cava, & Musitu, 2010; Fundación Ayuda a Niños y Adolescentes en Riesgo [Support for Children and Adolescents at Risk] (ANAR), Fundación Mutua Madrileña, 2016, 2017, 2018; Kowalski et al., 2014), and others finding a greater number of cybervictimized boys (Durán & Martínez, 2015), or finding no significant sex differences (Didden et al., 2009; Katzer, Fetchenhauer, & Belschak, 2009), or only very small differences (Álvarez-García et al., 2017). Regarding the cyberbully role, some studies have found a greater prevalence of male bullies (Buelga & Pons, 2012; Fundación ANAR, Fundación Mutua Madrileña, 2016, 2017, 2018), although in recent reviews of cyberbullying, the results are quite variable (Navarro, 2016; Zych, Ortega-Ruiz, & Del Rey, 2015). Concerning age, previous studies have indicated that cyberbullying is more frequent in early adolescence, decreasing with age (Li, 2007; Smith et al., 2008). However, Buelga and Pons (2012) pointed out that cyberbullying increases in mid-adolescence (15-16 years). In the study of Martínez et al. (2019), older adolescents also presented more disruptive behavior than younger ones. Nevertheless, research on cyberbullying and age is inconclusive.

2.4. The present study

The above-mentioned research data and relevant findings indicate the importance of warmth, parental supervision, and strictness, characteristic factors of the socialization styles. Nevertheless, none of these works analyzed analysis the relations between cyberaggression, cybervictimization, and the parental styles typology proposed by Maccoby and Martin (1983). This classification is one

of the most confirmed in the scientific literature and has shown its utility and validity in the analysis of psychosocial adjustment in adolescence (Oliva, Parra, & Arranz, 2008).

Hence, one of the goals of this work is to explore the relations between the different parenting styles proposed by Maccoby and Martin (1983) and cybervictimization and cyberaggression. It is expected that:

H1. The indulgent style—high warmth and low strictness/imposition—and the authoritative style—high warmth and high strictness/imposition based on reasoned control—will be related to lower levels of cyberaggression and cybervictimization than the neglectful and authoritarian styles, both characterized by low warmth and by low and high strictness based on coercive control, respectively.

Another of the goals proposed is to analyze the role of sex and age in cybervictimization and cyberaggression. Therefore, we expect that:

H2. Girls will be more cybervictimized than boys, although boys will score higher as cyberbullies.

H3. Adolescents aged 15 to 18 years will obtain higher scores in cyberaggression and cybervictimization than adolescents aged 12 to 14 years. As the results concerning age and cyberbullying are very heterogeneous, we shall explore possible differences in cyberbullying in two age ranges (12-14 years and 15-18 years). The hypothesis is based on the results obtained by Buelga and Pons (2012), who observed an increase of cyberbullying as of age 15. Hence, we used these authors' measurement instrument. We also will explore possible specific interactions between parenting styles, sex, and age with regard to cyberaggression and cybervictimization.

H4. An interaction will be found between parenting styles and sex. Adolescent girls from indulgent and authoritative families will obtain lower scores in cybervictimization and cyberaggression than girls and boys from authoritarian and neglectful families.

H5. There will be a significant interaction between parenting styles and age. Following the study of Lwin, Stanaland, and Miyazaki (2008), adolescents aged 12 to 14 from restrictive families will obtain lower scores in cybervictimization and cyberaggression than adolescents aged 15 to 18 from similar families.

The main purpose of this study was to analyze the relationships between parenting styles and cyberbullying as a function of adolescents' sex and age. The findings of this research can contribute to the development of different forms of intervention, which will involve working with the families to achieve their active participation in order to decrease cyberbullying.

2. Material and methods

2.1. Participants

Participants in this study were 2480 adolescents of both sexes aged between 12 and 18 years ($M = 14.69$, $SD = 1.82$), of whom 81 were excluded: 56% for not attending school on the day the instruments were administered, usually due to illness; 28% for erroneous responses; 12% for difficulties understanding the Spanish language (foreign students); and 4% of students who voluntarily left the study or who systematically responded the same on all the scales. The final sample was made up of 2399 adolescents (50.2% boys) enrolled in 19 public and private schools of Compulsory Secondary Education and High School of the provinces of Huelva, Seville, Cadiz, and Cordoba (western Andalusia, Spain).

There was a total number of 266,985 students in the above-mentioned region. This region has a total of 905 schools, 589 (65%) public schools and 386 (35%) private schools. The sample size required with a sampling error of $\pm 2\%$, a 95% confidence interval, and the population variance of 0.50 was 2380 subjects. Stratified cluster sampling was used for sample selection. The primary sampling units were the geographical urban and rural areas. The subunits were public and private schools in each area, which were randomly and proportionally selected according to the number of students from each province. We selected 6 classrooms in each school, one classroom for each

academic year, and in those schools that had more than one classroom per course, we selected the classroom randomly. In the schools whose principal declined to participate, we selected another school to complete the sample. The schools were located in middle socioeconomic neighborhoods. Regarding the families' sociocultural level, they had middle and higher studies. The analysis of mean difference of the target variables, based on the location of the school and its public or private status, was nonsignificant, so these variables were not included in subsequent analyses.

2.2. Measures

2.2.1. Parenting Styles

Parental Socialization Scale (ESPA29, Musitu & García, 2001). This instrument is based on the two-dimensional theoretical model of parental socialization (Darling, & Steinberg, 1993; Maccoby, & Martin, 1983). It contains 212 items (106 parallel items for each parent; mother and father). Adolescents rate their parents' actions in 29 situations that are representative of everyday family life in western culture: 16 items refer to children's rule-following behavior (i.e., "I respect the schedules established in my home") and 13 refer to behavior that does not follow these rules (i.e., "I'm dirty and untidy"). For each of these situations, on a 4-point scale ranging from 1 (*never*) to 4 (*always*), adolescents rate their parents' actions in terms of affection ("Shows me love") and indifference ("Is indifferent") when the adolescent follows the rule, and in terms of dialogue ("Talks to me"), indifference ("Doesn't care"), verbal coercion ("Scolds me"), physical coercion ("Hits me"), and deprivation ("Deprives me of something") when the adolescent disobeys the rule. Thus, a global measure is obtained for the dimensions of the socialization model—strictness/imposition and warmth/affection—through which the parenting style is classified as authoritative, indulgent, authoritarian, and neglectful. The score in the warmth/affection dimension is obtained by averaging the subscales of affection, dialogue, indifference, and displeasure (in the last two, in the score is reversed because they are inversely related to the dimension). The score in the strictness/imposition dimension is obtained by averaging the subscales of verbal coercion, physical coercion, and deprivation. The Cronbach alpha reliability coefficients for the scale were:

warmth/affection .90, and strictness/imposition .96; and for the seven subscales, they were: Affection .96; Indifference .96; Dialogue .96; Displeasure .91; Verbal Coercion .95; Physical Coercion .95; and Deprivation .96.

2.2.2. *Cybervictimization*

The Adolescent Victimization through Mobile Phone and Internet Scale (CYBVIC; Buelga, Cava, & Musitu, 2012). This scale consists of 18 Likert-type items with responses ranging from 1 (*never*) to 4 (*always*). The scale measure cybervictimization experienced through mobile phones and Internet in the last 12 months. Victimization by mobile phone is measured with 8 items (i.e., “They have threatened me to scare me”), and victimization by Internet is evaluated with the same 8 items plus 2 items related to identity theft (i.e., “They have pretended to be me in order to say or do bad things on the Internet”). In this study, we used a general index of cybervictimization resulting from the total score of the scale. In the present study, the Cronbach alpha reliability coefficient for the scale was .88.

2.2.3. *Cyberaggression*

The Cyberbullying Scale (CYB-AGRESS; Buelga & Pons, 2012). This scale consists of 10 Likert-type items with a response range of 1 (*never*) to 5 (*very often*). The items measure cyberaggression in the last 12 months by mobile phone and Internet (i.e., “I’ve insulted or made fun of someone”) and provide a general index of cyberbullying from the aggressor’s viewpoint. In the present study, the Cronbach alpha reliability coefficient for the scale was .76.

2.3. *Procedure*

The principals of the selected schools were initially contacted to explain the goals and purpose of the investigation and request their participation. We then sent a letter to the students’ parents, explaining the investigation and requesting their written consent for their children’s participation in the study. Subsequently, we administered the instruments in a 45-minute session. Instrument administration was performed under the supervision of previously trained researchers, in

the normal classrooms of each of the participating groups and during a regular class period. The adolescents were informed that their participation in the study was voluntary and anonymous. The study fulfilled ethical values required in research with human beings, respecting the fundamental principles included in the Declaration of Helsinki and its subsequent updates.

2.4. Statistical analyses

To analyze the data of this work, we used multivariate analysis of variance with the statistical package SPSS (version 17). The investigation design was cross-sectional and correlational. We applied a multivariate factorial design (MANOVA, $4 \times 2 \times 2$) with the set of criterion variables (cyberaggression and cybervictimization), considering parenting style (authoritative, indulgent, authoritarian, and neglectful) and adolescents' sex (male and female) and age (12-14 years and 15-18 years) as independent variables. Subsequently, several univariate *F*-tests were performed to analyze differences in the dependent variables and we applied the Bonferroni post-hoc test. The age groups were based on two criteria: one refers to the report of the Fundación ANAR and Fundación Mutua Madrileña (2016, 2017, 2018) carried out in Spain, which observed differences in cyberbullying engagement at approximately 13 to 14 and 15 to 16 years. Martínez et al. (2019), in their study on traditional bullying, cyberbullying, and parental styles, also used two similar age groups to those of the present study (12 – 14 years and 15 – 17 years). The second criterion is the educational cycle, because at age 15, adolescents begin the second cycle of Secondary Education.

3. Results

3.1. Descriptive analyses

Table 1 presents the crossed distribution of parenting styles with sex and age. The distribution between parenting styles and sex was not statistically homogeneous, $\chi^2(3) = 9.87, p < .05$, implying that the two variables are related. With regard to the distribution between age group and parenting styles, the results showed no significant group differences, $\chi^2(3) = 4.38, p > .05$, indicating that they are statistically homogeneous. Moreover, cyberaggression and cybervictimization were positively and significantly correlated ($r = .46, p < .001$).

3.2. Prior multivariate analyses

In the MANOVA of the variables of cybervictimization and cyberaggression, statistically significant differences were observed in the main effects of parenting styles, $\Lambda = .976$, $F(6, 4764) = 9.54$, $p < .001$, $\eta_p^2 = .012$, sex, $\Lambda = .975$, $F(2, 2382) = 30.79$, $p < .001$, $\eta_p^2 = .025$; and age, $\Lambda = .992$, $F(2, 2382) = 9.34$, $p < .01$, $\eta_p^2 = .008$. A significant interaction was found between parenting styles and sex, $\Lambda = .989$, $F(6, 4764) = 4.49$, $p < .01$, $\eta_p^2 = .006$. No statistically significant interactions were obtained between parenting styles and age, $\Lambda = .995$, $F(6, 4764) = 1.87$, $p = .083$, $\eta_p^2 = .002$; sex and age, $\Lambda = .998$, $F(2, 2382) = 2.70$, $p = .067$, $\eta_p^2 = .002$; or parenting styles, sex, and age, $\Lambda = .997$, $F(6, 4764) = 1.26$, $p = .272$, $\eta_p^2 = .002$.

3.3. Parenting styles, cybervictimization, and cyberaggression

As shown in Table 2, the ANOVA yielded significant differences in cybervictimization and cyberaggression. In the Bonferroni tests, it was found that adolescents from authoritarian families obtained statistically higher scores in cybervictimization than adolescents from neglectful, authoritative, and indulgent families. No significant differences were found between these three groups. Regarding the variable cyberaggression, adolescents from the indulgent group obtained significantly lower mean scores than the authoritarian and neglectful groups, but no significant differences were observed with regard to the authoritative group. Participants from the authoritative group obtained lower cyberaggression levels than those from the authoritarian group. No significant differences were observed between the authoritarian group and the neglectful group in cyberaggression.

3.4. Main effects of the demographic variables

With regard to sex, the ANOVA yielded statistically significant differences in cybervictimization, $F(1, 2383) = 12.62$, $p < .001$, $\eta_p^2 = .005$; and cyberaggression, $F(1, 2383) = 20.87$, $p < .001$, $\eta_p^2 = .009$. Girls obtained higher scores in cybervictimization than boys, and boys obtained higher scores in cyberaggression.

The ANOVA using age as the independent variable yielded statistically significant differences in cyberaggression, $F(1, 2383) = 18.45, p < .001, \eta_p^2 = .008$; but no significant differences were found in the variable cybervictimization, $F(1, 2383) = 2.38, p = .123, \eta_p^2 = .001$. The group of adolescents aged between 15 and 18 obtained higher scores in cyberaggression than the group of adolescents aged between 12 and 14.

3.5. Effect of the interaction between the variables parenting styles and sex

A statistically significant interaction effect between parenting styles and sex was obtained in cybervictimization, $F(3, 2383) = 6.28, p < .001, \eta_p^2 = .008$. Cyberaggression was nonsignificant, $F(3, 2383) = .254, p = .055, \eta_p^2 < .003$.

Table 3 presents the results of the Bonferroni test, indicating that adolescent girls from authoritarian families obtained the highest scores in cybervictimization. These differences were significant compared to the rest of the analyzed groups, both boys and girls, and in any of the parenting styles considered. Lower cybervictimization scores were observed in boys from indulgent families in comparison with boys from authoritarian families and girls from authoritative families. Lastly, the group of girls from authoritative families presented higher cybervictimization scores than boys from authoritative families.

4. Discussion

The purpose of this investigation was to explore the relations between the different parenting styles proposed by Maccoby and Martin (1983) and cybervictimization and cyberaggression as a function of adolescents' sex and age. The results of the MANOVA revealed statistically significant differences in the main effects of parenting styles, sex, and age in the dependent variables of cybervictimization and cyberaggression. A statistically significant interaction effect was also obtained between parenting styles and sex.

The findings obtained in the main effects of parenting styles partially confirmed H1. Adolescents educated with an authoritarian or neglectful style obtained higher scores in cyberaggression in comparison to the groups from authoritative and indulgent families. This aspect

seems to be related to the low warmth expressed by authoritarian and neglectful parents. In fact, adolescents involved in cyberbullying report weaker emotional bonds with their parents and lower parental warmth (Kowalski et al., 2014). Deficient affective socialization may contribute to the development of poor coping resources and social skills in the virtual setting, which enhances cyberaggression.

With regard to cybervictimization, participants from the authoritarian group obtained the highest scores. This result is related to the findings of other investigations confirming that cyberaggressors are more likely to be victims of cyberbullying (Estévez, Villardón, Calvete, Padilla, & Orue, 2010). In this regard, our study also found a moderate and positive correlation between cybervictimization and cyberaggression. This may be related to the dual role of cyberaggressor and cybervictim performed by some adolescents involved in cyberbullying (Buelga, et al. 2017). The peak of cybervictimization of the group from authoritarian families could be attributed to the more coercive control exerted by these parents. These highly restrictive parental practices, also in the online setting, are likely to generate reactance (Lwin et al., 2008). According to the reactance theory, if adolescents perceive strong constraints to their freedom, they may be motivated to disobey their parents (Miron & Brehm, 2006), for example, by accessing risky virtual environments in which they are more likely to be victimized.

No differences were found between the neglectful, authoritative, and indulgent groups. This result was unexpected for H1 because we thought that adolescents from neglectful families would obtain similar levels of cybervictimization as adolescents from authoritarian families, and higher levels than adolescents from indulgent and authoritative families. In the neglectful, authoritative, and indulgent style, the typical mechanisms of reactance theory would be less likely to emerge. In this sense, the neglectful style—characterized by very low strictness/imposition—would generate lower reactance because the parents would not forbid access to risky online spaces, which would favor lower participation in online contexts that are potentially dangerous for victimization.

In the indulgent style, behavioral control is not restrictive, and children are socialized through guidance and warmth, making their behavioral opposition more difficult. In the authoritative style, characterized by reasoned behavioral control with a high component of supervision, the rules are clear and there is also high parental warmth. Therefore, these adolescents show less reactance and have a lower risk of being cybervictimimized, in contrast to adolescents from authoritarian families.

In reference to the interaction effect between parenting styles and sex referred to in H4, we found significant differences in the variable cybervictimimization but cyberaggression was nonsignificant, so H4 was only partially confirmed. Specifically, we observed that girls from authoritarian families obtained higher scores in cybervictimimization than all the other groups analyzed. This finding reinforces the result obtained in the above-mentioned main effects of parenting styles, but it also suggests that girls who are educated in an authoritarian environment—high strictness/imposition and low warmth—more likely to suffer cyberbullying. Several studies have suggested that girls (Fundación ANAR, Fundación Mutua Madrileña, 2016, 2017, 2018; Kowalski et al., 2014) and adolescents from authoritarian families (Martínez et al., 2019) are more likely to be cybervictimimized.

Due to the different processes of gender socialization for boys and girls, female adolescents may be especially affected by the authoritarian educational style and the negative events derived from this dynamic in the family context. Girls' greater sensitivity to coercive methods may affect their learning and development of coping strategies and resources in the face of possible cyberbullying. In a prior study that analyzed violence in the classroom and the family environment, it was reported that negative climate—characterized by low cohesion, little affective expressiveness, and high family conflict—is related to violent dynamics in the classroom in adolescent girls (Estévez, Murgui, Musitu, & Moreno, 2008).

The low affection and self-confidence promoted by an authoritarian education would severely limit the development of self-esteem and the mechanics of family support in the children, essential resources to cope with situations of cyberbullying (Grusec, Danyliuk, Kil, & O'Neill, 2017;

Martínez et al., 2019). This scenario could produce a process of positive feedback between cybervictimization and the deficient resources and strategies in adolescents from authoritarian families. In addition, reactance may emerge, favoring adolescents' access to risky virtual spaces in which they can be cybervictimized. These assumptions must be confirmed in future studies.

It was also noted that boys from indulgent families obtained lower scores in cybervictimization than boys from authoritarian families and than girls from authoritative families. Emotional expressiveness, positive communication, parental support, and low imposition—characteristics of the indulgent style—may help to foster more parent-child trust and less confrontation, which serve as protective factors against cybervictimization (Martínez et al., 2019). This result is line with the findings of Accordino and Accordino (2011), who confirmed that students with close parental relationships were cybervictimized less frequently.

The open communication and low strictness of the indulgent style, in contrast to the high control of the authoritarian and authoritative styles, act as a protective resource against children's involvement in cyberbullying (Martínez et al., 2019). The data obtained are related to the findings from previous studies, suggesting the greater effectiveness of positive family communication to control children's online behavior, in comparison with coercive and strict parental practices, characterized by levels higher of imposition (Appel et al., 2014; Buelga et al., 2016; Martínez et al., 2019; Solecki et al., 2014).

H5, which proposed an interaction between parenting styles and age, was nonsignificant. In reference to the main effects of sex, as formulated in H2, girls obtained higher scores in cybervictimization than boys, who presented higher levels of cyberaggression. These findings coincide with the results from a report on cyberbullying by the Fundación ANAR and Fundación Mutua Madrileña (2016, 2017, 2018). This result is also in line with those obtained by other authors, indicating the higher level of cybervictimization suffered by girls (Buelga et al., 2010; Kowalski et al., 2014) and boys' higher levels of cyberaggression (Buelga & Pons, 2012). A possible explanation of this result lies in the fact that many cyberaggressive behaviors have an

important sexist content and, in fact, they are performed by men against women (Calvete, Orue, Estévez, Villardón, & Padilla, 2010).

Regarding the main effect of age, H3 was partially confirmed. Significant age differences in cyberaggression were observed, but not in cybervictimization. Adolescents between 15 and 18 years of age obtained higher scores in cyberaggression than adolescents aged between 12 and 14. This result coincides with that obtained by Buelga and Pons (2012), who found higher levels of cyberbullying in adolescents aged 15-16 years (the highest age of their sample).

The observed differences suggest that cyberbullying increases in mid and late adolescence. Another possible explanation of the increase of cyberbullying among adolescents aged 15 to 18, compared with the 12 to 14 age range, may be the greater accessibility in this stage to electronic or digital media (Fundación ANAR, Fundación Mutua Madrileña, 2016, 2017, 2018).

Although this study presents interesting contributions to the analysis of parenting styles and cyberbullying, it presents some limitations. The results presented in this work should be interpreted with caution due to the cross-sectional nature of the study and the correlational nature of the data, which precludes establishing causal relationships among the variables. A longitudinal study of measures at different times would help to clarify the observed associations.

Lastly, the implications of this study can contribute to the orientation of public policies and actions for the prevention of and intervention in cyberbullying. Peer violence implies high costs for public administrations and society, which transcend the purely economic context, affecting personal and social well-being, and the health and psychosocial development in the family, the school, and the community. Specifically, the results of this work make it possible to: (1) focus intervention programs on risk and protective factors with scientific evidence. The findings of this study reveal the importance of the relationship between parenting styles and adolescents' engagement in cyberbullying. Therefore, we consider that these results are a first step in the development of rigorous intervention programs based on scientific evidence to contribute efficiently to positive parenting practices (Álvarez, Padilla, & Máiquez, 2016; Hidalgo, Jiménez, López-Verdugo,

Lorence, & Sánchez, 2016; Martínez-González, Rodríguez-Ruiz, Álvarez-Blanco, & Becedóniz-Vázquez, 2016; Suárez, Rodríguez, & Rodrigo, 2016). These programs should include parental education so that families become aware of the importance of warmth, communication, and supervision as protective factors against their children's engagement in cyberbullying. In this regard, a recent systematic review of 17 cyberbullying intervention programs with implications for evidence-based practice indicated the importance of the education and training of parents (Hutson, Kelly, & Militello, 2018). (2) This work can increase the social awareness of risk and protective factors as a function of sex. The present study indicates that girls suffer more cybervictimization, and boys perform more cyberaggression. In future studies on cyberbullying, we recommend analyzing these differences in greater depth and exploring other psychosocial variables as a function of sex. If these differences are confirmed, we would recommend adapting intervention proposals as a function of the participants' sex. (3) This work highlights the role and importance of parental styles in prevention and intervention programs. Families who are aware of the implications of their role as educators can contribute to the prevention of and intervention in cyberbullying and school violence. Intervention in cyberbullying programs should train, inform, and make the parents aware of their importance in their children's socialization in the digital age. Children's early access to devices like smartphones, which allow permanent online connection, makes it necessary to raise families' awareness of their responsibility for their children's digital education, by means of mediation, dialogue, and warm communication.

5. Conclusion

The dynamic and social nature of cyberbullying requires a rigorous analysis of the relationship with other scarcely studied but important factors in the prevention of this problem. In the scientific literature on traditional bullying, the importance of the family environment has been indicated but there are hardly any studies that relate parenting styles with cyberbullying. This study analyzed the relationship between parenting styles, cyberaggression, and cybervictimization as a function of sex and age. The results show the protective role of warmth/affection, and supervising,

which are characteristic of the indulgent and authoritative styles, against engagement in cyberbullying. Conversely, the authoritarian style, in which strong control is exercised but with little affection, has proven to be a risk factor for being a target of cyberbullying, especially in girls. This aspect suggests the need for gender-sensitive studies in relation to parenting styles. These findings show the need to consider parental education in cyberbullying prevention programs. The learning and work of the families and their children will promote positive school coexistence and reduce cyberbullying behavior.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Conflict of interest

The authors declare that they have no conflicts of interest.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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Highlights

- Warmth and reasoning control are key aspects for lower involvement in cyberbullying.
- Risk of cyberbullying is related to authoritarian and neglectful parenting styles.
- Strictness is associated with a higher probability of being cybervictimized.
- Authoritarian parenting style for girls shows the highest levels of cybervictimization.

Table 1.

Sociodemographic variables

Variables	Total Sample <i>N</i> (%)	Parenting styles				χ^2
		Neglectful (<i>n</i> = 736) <i>N</i> (%)	Authoritarian (<i>n</i> = 513) <i>N</i> (%)	Indulgent (<i>n</i> = 457) <i>N</i> (%)	Authoritative (<i>n</i> = 693) <i>N</i> (%)	
Sex						$\chi^2(3) = 9.87^*$
Boys	1204 (50.2%)	372 (30.9%)	231 (19.2%)	226 (18.8%)	375 (31.1%)	
Girls	1195 (49.8 %)	364 (30.5%)	282 (23.6%)	231 (19.3%)	318 (26.6%)	
Age Group						$\chi^2(3) = 4.38$
[12-14]	1144 (47.7%)	344 (30.1%)	228 (19.9%)	228 (19.9%)	344 (30.1%)	
[15-18]	1255 (52.3%)	392 (31.2%)	285 (22.7%)	229 (18.2%)	349 (27.8%)	

Note: * $p < .05$.

Table 2.

Mean, Standard Deviation and post-hoc comparisons between parenting styles, cybervictimization and cyberaggression.

	Parenting Styles				$F(3, 2383)$	η_p^2	Post hoc
	Neglectful $M(SD)$	Authoritarian $M(SD)$	Indulgent $M(SD)$	Authoritative $M(SD)$			
CYV	1.18 (.24) ^a	1.26 (.31) ^b	1.15 (.21) ^c	1.19 (.24) ^d	15.88***	.020	b > a, c, d
CYA	1.20 (.28) ^a	1.23 (.31) ^b	1.14 (.25) ^c	1.18 (.26) ^d	9.47***	.012	c < a, b d < b

Note: CYV = Cybervictimization; CYA = Cyberaggression. $\alpha = 0.05$.

*** = $p < .001$

Table 3.

Mean, Standard Deviation and post-hoc comparisons between parenting styles, sex and cybervictimization.

		Parenting Styles				Post-hoc
		Neglectful <i>M (SD)</i>	Authoritarian <i>M (SD)</i>	Indulgent <i>M (SD)</i>	Authoritative <i>M (SD)</i>	
Cybervictimization	Girls	Group 1	Group 2	Group 3	Group 4	2>1, 3, 4, 5, 6, 7, 8
		1.17 (.21)	1.29 (.34)	1.16 (.21)	1.22 (.25)	7<6, 4
		Group 5	Group 6	Group 7	Group 8	4>8
		1.19 (.28)	1.22 (.26)	1.14 (.21)	1.15 (.23)	

Note: $F(7, 2391) = 11.25^{***}$; $\eta_p^2 = .032$. $\alpha = .05$

*** = $p < .001$