



Bullying, Cyberbullying and Mental Health: The Role of Student Connectedness as a School Protective Factor

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ABSTRACT

Traditional bullying and cyberbullying are linked to adverse mental health outcomes. Student connectedness has been recently identified as a potential protective factor in these relationships. Nonetheless, the multilevel nature of these interactions has been frequently overlooked. The present study pretends to fill this gap by exploring the associations between individual levels of bullying and cyberbullying and three adjustment outcomes (i.e., suicidal behavior, symptoms of depression, and self-esteem), as well as the moderating role of the school level of student connectedness on these relationships. The participants in this work were 1,774 students aged 14-18 years ($M = 15.70$, $SD = 1.26$), of which 53.7% were female, from 31 secondary schools in Spain. We used previously validated self-reported questionnaires in this study. Traditional victimization and cybervictimization, as well as cyberbullying, were positively related to suicidal behavior and depression, and were negatively related to self-esteem. Conversely, individual levels of student connectedness were associated with lower levels of suicidal behavior and depression, and with higher levels of self-esteem. Moreover, school levels of student connectedness buffered the adjustment problems experienced by victims of cyberbullying. These findings highlight the importance of student connectedness as a possible target for school-based cyberbullying prevention.

Acoso escolar, *ciberbullying* y salud mental: el rol de la cohesión entre estudiantes como factor protector escolar

RESUMEN

El acoso escolar y el *ciberbullying* están asociados a efectos adversos para la salud mental. La cohesión entre estudiantes se ha identificado recientemente como un potencial factor protector respecto a este tipo de relaciones. No obstante, con frecuencia se ha pasado por alto la naturaleza multinivel de estas interacciones. El presente estudio pretende llenar este vacío explorando la asociación entre el nivel individual de acoso y *ciberbullying* y tres indicadores de ajuste (i.e., conducta suicida, síntomas de depresión y autoestima), así como el papel moderador del nivel escolar de cohesión estudiantil en estas relaciones. Los participantes fueron 1,744 estudiantes de 14-18 años ($M = 15.70$, $DT = 1.26$), de los cuales el 53.7% eran mujeres, de 31 centros de educación secundaria de España. En el estudio se utilizaron autoinformes previamente validados. La victimización tradicional y la cibervictimización, así como el *ciberbullying*, se relacionaron positivamente con la conducta suicida y la depresión y negativamente con la autoestima. Por el contrario, los niveles individuales de cohesión entre estudiantes se asociaron con niveles más bajos de conducta suicida y depresión y con niveles más elevados de autoestima. Además, los niveles escolares de cohesión entre estudiantes amortiguaron los problemas de adaptación experimentados por las víctimas de *ciberbullying*. Estos hallazgos destacan la importancia de la cohesión entre estudiantes como un posible objetivo de cara a la prevención del *ciberbullying*.

Palabras clave:

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Bullying is a type of aggressive behavior that a student or group of students intentionally and repeatedly exerts upon another student who cannot defend themselves because of an imbalance of power (Hymel & Swearer, 2015; Smith, 2019). This type of behavior is considered cyberbullying when it is carried out via information and communication technologies (ICTs), such as mobile phones, email, social networks, blogs, web pages, etc. (Campbell & Bauman, 2018; Smith et al., 2008). Both types of bullying are frequently related. For instance, Hase et al. (2015) found that 93% of students who suffered cyberbullying also suffered traditional bullying. Nonetheless, some studies suggest that there are important differences between both phenomena (Law et al., 2012). In that regard, cyberbullying has its own peculiarities, such as the victim being unable to escape from the intimidating situation, the greater scope of aggressive acts because they can be spread quickly to a large audience, and the greater invisibility and anonymity of the bully, which usually causes the victim to feel more defenseless (Tokunaga, 2010).

According to a recent study by the World Health Organization (WHO) conducted in 227,441 students aged 11, 13, and 15 years old from 45 countries, 10% and 6% of the students, respectively, reported having suffered or perpetrated bullying at least twice or three times in the two months prior (Inchley et al., 2020). For cyberbullying, these percentages rose to 13% for victimization and to 10% for perpetration. Spain obtained prevalence levels below the average, both in traditional bullying (3% and 5%, for victimization and perpetration, respectively) and in cyberbullying (5.5% and 6.5%, for victimization and perpetration, respectively). Compared with the prior study carried out by the WHO (Inchley et al., 2016), there had been a general decrease in traditional bullying and an increase in cyberbullying. In addition, these results contrast with those we found in the previously published literature that had observed a lower prevalence of cyberbullying compared to bullying (George & Oders, 2015; Modecki et al., 2014). Regarding age, both traditional bullying and cyberbullying showed an increase at the beginning of secondary education with a later decline (Guo, 2016). Interestingly, in terms of gender, a different pattern has been observed for both forms of bullying for males and females. While a higher percentage of males were found to be involved in traditional bullying, both in the victim and bully roles (Smith et al., 2019; Tokunaga, 2010), the literature indicates that females were more often the victims of cyberbullying compared to males (Inchley et al., 2020; Kowalski et al., 2019; Smith et al., 2019). Nevertheless, it is worth noting the importance of being cautious when interpreting and contrasting the prevalences of traditional and cyberbullying reported in different studies because there is no consensus on the definition and measurement of these phenomena (DeSmets et al., 2016; Olweus & Limber, 2018).

The negative consequences of both bullying and cyberbullying in the short, medium, and long term have been widely acknowledged (e.g., Kowalski et al., 2014; Schoeler et al., 2018; Young-Jones et al., 2015), highlighting that both bully and victim students are at a greater risk of suffering psychosocial maladjustment and psychopathological disorders and symptoms in adolescence and adult life. Furthermore, some authors have pointed out that the effects of cyberbullying can be more devastating than those of traditional bullying, especially among victimized students (Baier et al., 2019; Bonanno & Hymel, 2013; Campbell et al., 2012).

For instance, different meta-analyses have revealed the positive relationship between experiencing and perpetrating bullying or cyberbullying and suicidal behavior and depression in both cross-sectional and longitudinal studies (Bannink et al., 2014; Holt et al., 2015; Kowalski et al., 2014; Moore et al., 2017). Indeed, cybervictimization has been more strongly related to suicidal ideation and the symptomatology of depression than traditional victimization (Katsaras et al., 2018; Perren et al., 2010; van Geel et al., 2014). Moreover, results have shown that the impact of bullying and cyberbullying on suicidal ideation and depression can be related

to gender, with females being more susceptible to the damaging consequences of these behaviors than males (Iranzo et al., 2019; Klomek et al., 2010; Koyanagi et al., 2019; Kowalski et al., 2014).

Another mental health outcome that is often studied in relation to bullying and cyberbullying is self-esteem. Indeed, there is a considerable body of research to suggest a significant negative relationship between both forms of bullying and self-esteem (Kowalski & Limber, 2013; Martínez et al., 2020; Palermi et al., 2017; Tsaousis, 2016). Most importantly, this negative relationship has been found to be transactional (Modecki et al., 2013; van Geel et al., 2018). In other words, low self-esteem is both a predictor and a negative consequence of the bullying or cyberbullying experience. In addition, previous studies have shown higher self-esteem scores among traditional bully males compared to bully females (Brito & Oliveira, 2013; Martínez et al., 2020).

Recently, researchers have been focusing more effort on determining which factors protect students from the negative impact of bullying and cyberbullying. To further this end, the socio-ecological model (Bronfenbrenner, 1979) may provide a framework to integrate the complexity of the many variables potentially involved, thereby reducing the potential consequences of these phenomena. In line with this approach, beyond the impact of individual variables (e.g., age, gender, etc.), a growing number of studies are analyzing the possible influence that different contextual variables (e.g., classroom and school) could have on bullying and cyberbullying in terms of different adjustment outcomes (Morin et al., 2018).

A potential protective factor that has recently gained a significant amount of attention in relation to bullying and cyberbullying, especially at an individual level, is student connectedness. Student connectedness is generally defined as the perception of belonging to peers, specifically the perception that students help, like, trust, and respect one another (Bradshaw et al., 2014). Therefore, student connectedness is mainly based on students' sense of attachment (feeling cared about by other students) and belonging to (feeling a part of) their school. According to the Social Developmental Model (Catalano et al., 2004), this type of social bonding may promote healthy development and prevent problem behaviors. This outcome might be expected because school bonding leads students to conform more to the school's values and norms so as not to risk losing these ties. Thus, if the norms are positive, positive student development and behavior become the likely results. This assumption could also be congruent with the Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010). One of the major constructs of this theory is termed 'thwarted' (or low) belongingness. Social beings have an innate need for social connectedness, in other words, a need to belong (Baumeister & Leary, 1995). When this need is unmet, numerous negative health consequences result, one of which is a desire for suicide (Van Orden et al., 2010; Whitlock et al., 2014) and probably also the symptomatology of depression and poor self-esteem, given the strong relationship between these three variables (Fonseca-Pedrero et al., 2020). In that regard, students' perceived connectedness to their peers has been related with both less victimization and less bullying and cyberbullying (Eugene et al., 2021; Williams & Guerra, 2007), as well as with less suicidal ideation, fewer suicide attempts (Arango et al., 2018), and lower levels of depression (Kidger et al., 2012; Klinck et al., 2020).

Although several studies have investigated how student connectedness can buffer the association between victimization or cybervictimization and adjustment problems (Davidson & Demaray, 2007; Kim et al., 2020), most of this research has adopted an individual perspective. That is, this previous work has only examined how students' perception of connectedness moderates levels of bullying or cyberbullying behavior. However, from a social-ecological perspective, and considering the Social Developmental Model, student connectedness can also be considered a school variable as it largely depends on the shared school-wide relational atmosphere,

rather than on the perception of individual students (Morin et al., 2018). In that regard, less is known about the moderating effects of the school level of student connectedness and support of the individual adjustment problems of bullies and victims of traditional and cybernetic bullying. Therefore, in accordance with a social-ecological perspective (Smith, 2019), this study pretends to expand the focus from the individual who can be suffering or exerting bullying or cyberbullying to the context where these situations occur.

The purpose of the present study was to examine whether involvement in bullying and cyberbullying increased the risk of psychological problems among students, and to assess the role of school student connectedness and associations with bullying and cyberbullying. Specifically, our first research aim was to identify how both forms of bullying may be associated with increased risk of psychological adjustment (i.e., suicidal behavior, symptoms of depression, and self-esteem). In particular, we were interested in determining whether traditional and cyberbullying perpetrators and victims experienced more negative outcomes than their non-victimised or bullied peers, while also accounting for some student (i.e., age, gender, socioeconomic status – SES, and student connectedness) and school-level (i.e., number of students, proportion of minorities, and school student connectedness) factors. Given the aforementioned results regarding age and gender differences, as well as prior evidence for the influence of SES on bullying (e.g., Tippet & Wolke, 2014), and on some mental health outcomes such as suicidal behavior and depression (Jeon et al., 2013), these variables were used as individual controls. By the same token, the number of students and proportion of minority students in the school were included as control variables at the school level (Morin et al., 2018). Based on prior research, we predicted that experiencing bullying and cyberbullying, both as a victim or as a perpetrator, would be related with an increased risk for psychological maladjustment.

Our second aim was to investigate the potential role of school student connectedness (as a school variable) in the association between bullying and cyberbullying and mental health outcomes. We hypothesized that the school level of student connectedness would buffer the negative impact that individual bullying and cyberbullying can have on adolescent suicidal behavior, depression, and self-esteem.

Method

Participants

The participants were 1,774 students aged 14 to 18 years ($M = 15.70$; $SD = 1.26$), of which 959 were female (53.7%), from 31 schools in the region of La Rioja, Spain. The sample was selected by stratified random cluster sampling with the classroom as the sample unit. The sampling framework was the population of 15,000 students in La Rioja. The students belonged to different public (45.2%) and charter (54.8%) secondary and vocational training schools and were from different socio-economic levels. The variables used to stratify the sample were the geographical zone and the student educational stage. The distribution of the participants by age was as follows: 14-year-olds ($n = 338$, 19.1%), 15-year-olds ($n = 534$, 30.1%), 16-year-olds ($n = 409$, 23.1%), 17-year-olds ($n = 297$, 16.7%), and 18-year-olds ($n = 196$, 11.0%).

Instruments

European Bullying Intervention Project Questionnaire (EBIPQ; Brighi et al., 2012a; Ortega-Ruiz et al., 2016). The EBIPQ is a self-reported questionnaire designed to measure traditional bullying and victimization situations experienced at school. After providing a definition of bullying, students are asked to indicate the number

of times they have experienced 14 different situations (7 for victimization and 7 for bullying, e.g., 'Someone has spread rumors about me' and 'Someone has hit me') over the two months prior. Students responded to the 14 items on a 5-point Likert scale (0 = never, 1 = once or twice, 2 = once or twice a month, 3 = once a week, 4 = more than once a week). Given the distribution of responses and based on previous studies (Morin et al., 2018), for the purpose of the present work we dichotomized the items, both for victimization and bullying, i.e., as 'not victim/not bully' = 0 (never or once or twice) or 'victim/bully' = 1 (at least once or twice a month). In addition, for the purposes of this study, the roles of victim and bully were considered mutually exclusive. That is, to be considered a victim, the student had to score higher than 2 (at least once or twice a month) in any of the 7 victimization situations and lower than 2 (never or once or twice) in any of the 7 bullying situations. The EBIPQ showed good reliability for this sample (Cronbach's alpha = .79 for both victimization and bullying; omega total score = .82 and .80, for victimization and bullying, respectively).

European Cyberbullying Intervention Project Questionnaire (ECIPQ; Brighi et al., 2012b; Del Rey et al., 2015; Ortega-Ruiz et al., 2016). Like the EBIPQ, the ECIPQ is a self-reported questionnaire that evaluates the dimensions of cyberbullying and cybervictimization. After defining cyberbullying, the students are asked to indicate the number of times they have experienced 22 situations (11 for cybervictimization and 11 for cyberbullying, e.g., 'Someone has hacked into my account and pretended to be me' and 'Someone has posted embarrassing photographs or videos of me on the internet') in the two months prior. Again, students responded to the 22 items on a 5-point Likert scale (0 = never, 1 = once or twice, 2 = once or twice a month, 3 = once a week, 3 = more than once a week). The items were also dichotomized for cybervictimization and cyberbullying following the same criteria used for victimization and bullying described above. The ECIPQ showed adequate reliability for this sample (Cronbach's alpha = .81 and .73 for cybervictimization and cyberbullying, respectively; omega total score = .82 and .68 for cybervictimization and cyberbullying, respectively).

Student Connectedness (Bradshaw et al., 2014). This self-reported questionnaire comprises 5 items that assess students' belonging to the school and connections to other students (e.g., 'At this school, I feel like I belong', 'At this school, students trust one another', or 'At this school, students help one another'). The responses are scored on a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree). The scale showed good reliability in this sample (Cronbach's alpha = .86; omega total score = .91).

Family Affluence Scale-II (FAS-II; Boyce et al., 2006). SES was measured using the four-item FAS-II scale about family wealth which was appropriate for children. One item is scored 0 (no) or 1 (yes) (i.e., 'Do you have your own bedroom for yourself?'), a second item is scored 0 (no) to 2 (yes, two or more) (i.e., 'Does your family own a car, van or truck?'), and two items are scored from 0 (not at all/none) to 3 (more than twice/more than two) (i.e., 'During the past 12 months, how many times did you travel away on holiday with your family?', 'How many computers does your family own'). Scores in the scale can range from 0 to 9, with higher scores representing higher SES. Previous international (e.g., Hobza et al., 2017) and Spanish studies (e.g., Ortuño-Sierra et al., 2017) have used this scale as an indicator of socio-economic status.

Adolescent Suicidal Behavior Assessment Scale (SENTIA; Díez-Gómez et al., 2020). The SENTIA scale is a self-reported instrument comprising 16 dichotomous (yes/no) items designed to assess suicidal behavior in adolescents (e.g., 'Have you planned to take your own life?'). The SENTIA has shown adequate psychometric properties in Spanish adolescents (Díez-Gómez et al., 2020). The reliability of the scale in this sample was good (Cronbach's alpha = .90; omega total score = .91).

Reynolds Adolescent Depression Scale-Short Form (RADS-SF; Reynolds, 2002). The RADS-SF is a self-reported scale that measures

the severity of the symptomatology of depression (anhedonia, somatic complaints, negative self-evaluation and dysphoria) in adolescents. It consists of 10 items (e.g., 'I feel happy') on a 4-point Likert scale (1 = *almost never* to 4 = *almost always*). In this current study, we used the Spanish version which was adapted and validated for adolescents (Ortuño-Sierra et al., 2017). The scale showed adequate reliability for this sample (Cronbach's alpha = .69; omega total score = .84).

Rosenberg Self-esteem Scale (Rosenberg, 1965). This instrument is used to assess self-esteem and comprises 10 items (e.g., 'I certainly feel useless at times') scored on a 4-point Likert scale (1 = *strongly disagree* to 4 = *strongly agree*). In this present work, we used the Spanish version (Oliva et al., 2011), which showed good reliability in this sample (Cronbach's alpha = .89; omega total score = .89).

School-level variables. Some information on the school was gathered: the number of students in the school that completed the questionnaires and the proportion of minorities or other non-Spanish nationalities in the school. In addition to this school-level demographic information, scores for student connectedness (described above) were aggregated up to the school level for each of the 31 schools. That is, the school level of student connectedness was derived by averaging individual student connectedness scores for each school. In that regard, the school level of student connectedness was considered as a school-level variable.

Procedure

This research was approved by the General Directorate for Education of the Government of La Rioja and the Clinical Research Ethics Committee of La Rioja (Ref. CEImLAR P.I. 337). The research was conducted according to the principles expressed in the Declaration of Helsinki. Schools were contacted by telephone, email, or by postal mail. Initial contact with schools was made through the school principal, head of studies, or counselling department.

To standardize the administration process, all the researchers were provided with a protocol that had to be followed before, during, and after administration of the measurement instruments. The questionnaires were administered by computer and collectively in groups of 10 to 30 participants during a school session (50 minutes) in a classroom prepared especially for this purpose.

Participants were informed of the confidentiality of their responses and the voluntary nature of their participation. Informed consent from the students' parents or legal guardians was obtained for participants aged under 18 years old. The lack of informed consent was a cause of exclusion. The study was presented to the participants as a research about emotional well-being and mental health.

Data Analyses

First, we conducted descriptive analyses using SPSS software (version 26.0, IBM Corp., Armonk, NY, 2019). Gender and age differences were examined only for the student-level predictors.

Second, given the multilevel nature of both the data (i.e., students nested within schools) and hypotheses (i.e., the role of individual and school-level factors on students' mental health), a hierarchical linear modeling analysis was performed (HLM 8.1; Raudenbush et al., 2020). Multilevel modeling adjusts standard errors to correct for non-independence of data (Raudenbush & Bryk, 2002). Before conducting the multilevel analyses, we used SPSS to check for multicollinearity among the student- and the school-level variables (Aiken & West, 1991) in order to ensure that the control and the predictor variables were not highly correlated. Age, gender, SES, student connectedness, victimization, bullying, cybervictimization, and cyberbullying served as level-1 (within-, individual-) predictors. Suicidal behavior, depression, and self-esteem served as criterion variables. The

following school characteristics were modeled as level-2 (between-, school-) variables: number of students, proportion of minorities in the school, and school level of student connectedness. Level-1 variables were group centered, except for gender, victimization, bullying, cybervictimization, and cyberbullying, which were uncentered. All level-2 variables were grand centered. All the outcome variables (suicidal behavior, depression, and self-esteem) were treated as continuous data in these analyses (Garson, 2013; Raudenbush & Bryk, 2002).

Three nested models were estimated by HLM. The model-building process began by estimating an unconditional or null model with no variables in order to ascertain the intraclass correlation coefficient (Snijders & Bosker, 2012). The next step was to fit the model with level-1 variables. The coefficients resulting from this analysis can be interpreted in a similar way to traditional regression coefficients when the outcome variable is standardized. We then included level-2 variables as well as cross-level interactions between four individual-level variables (victimization, bullying, cybervictimization, and cyberbullying) and a school-level variable (student connectedness).

Because the assessment was completed via an online platform and in a supervised context (in computer classrooms during school hours under the supervision of a researcher), there were no missing data.

Results

Descriptive Statistics

Means (*M*), standard deviations (*SD*), and percentages of the study variables both at the student (predictors and outcomes) and school levels are reported in Table 1. Gender and age differences were examined only for student-level predictors. Males (19.8%) were more likely than females (15.6%) to be victims of bullying, $\chi^2(1) = 5.37, p < .05$, and 16-year-old participants were more likely to be victims of cyberbullying, $\chi^2(4) = 16.73, p < .01$. Older students (i.e., aged 16, 17, and 18 years) reported higher familiar SES than younger students, i.e., aged 14 and 15 years; Wilk's $\lambda = .997, F(4, 162.836) = 14.764, p < .001$, partial $\eta^2 = .032$. No other gender or age differences were found in the student-level predictors (i.e., bully, cyberbully, and student connectedness).

Multilevel Analyses for Mental Health Indicators

Unconditional model. A null model was first estimated (without any student or school-level variables) for suicidal behavior, depression, and self-esteem to see how much variance existed at the individual and school levels. The intraclass correlation coefficients (ICCs) indicated that a significant amount of the total variance in suicidal behavior (9.09%, $\chi^2 = 100.61, p < .001$), depression (2.02%, $\chi^2 = 63.01, p < .001$), and self-esteem (1.75%, $\chi^2 = 56.52, p < .01$) could be explained at the school level. Even though these percentages were relatively low, especially for depression and self-esteem, because they were above zero, they indicated the presence of some differences between suicidal behavior, depression, and self-esteem according to which school the students attended. In addition, the nested nature of these data denotes that data are multilevel in structure and should be analyzed as such (Snijders & Bosker, 2012), regardless of the extent to which the mental health outcomes varied between schools.

Level-1: Student-level analysis. First, we created three models for each of the student-level mental health outcomes (i.e., suicidal behavior, depression, and self-esteem) which only included level-1 variables, as presented in Table 2. Gender, being a victim of bullying, a victim of cyberbullying, or a cyberbully, were positively associated with suicidal behavior and depression, and negatively associated with self-esteem. In contrast, SES and student connectedness were

negatively associated with suicidal behavior and depression, but positively associated with self-esteem. Age and being a bully did not significantly increase the prediction of any of the three above mentioned mental health indicators. The individual variables entered in Model 1 explained 9.94%, 20.94%, and 20.53% of the variance in participant suicidal behavior, depression, and self-esteem, respectively.

Table 1. Descriptive Statistics for the Study Variables

	Mean/%	SD	Min	Max
Student-level variables (N = 1,774)				
Predictors				
Age	15.70	1.26	14.00	18.00
Female	53.7%			
SES	6.36	1.69	0.00	9.00
Student Connectedness	12.12	2.07	4.00	16.00
Victim ¹	17.9%			
Bully ¹	7.3%			
Cybervictim ¹	6.6%			
Cyberbully ¹	4.2%			
Outcomes				
Suicidal behavior	1.16	2.55	0.00	15.00
Depression	16.36	4.44	10.00	40.00
Self-esteem	30.86	5.53	10.00	40.00
School-level variables (N = 31)				
Number of students	57.67	46.11	12.00	198.00
Minority proportion	0.11	0.83	0.00	0.34
School Student Connectedness ²	12.07	0.55	10.71	12.95

Note. ¹At least once or twice a month or during the past two months; ²school mean for individual scores on Student Connectedness.

Level-2: School-level analysis. In the second set of predictive models (see Table 2), the number of students in the school, proportion of minorities, and school level of student connectedness were added to the previous level-1 models. Schools with a higher proportion of minority populations were associated with higher suicidal behavior.

The school-level variables entered in Model 2 explained 74.72%, 15.66%, and 61.95% of the variance between schools for suicidal behavior, depression, and self-esteem, respectively.

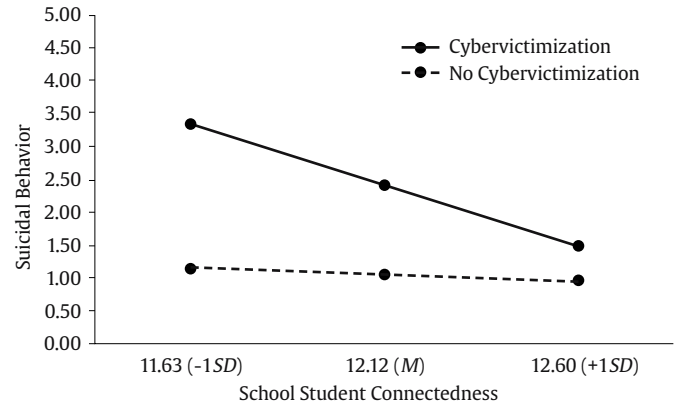


Figure 1. Association between Student Cybervictimization and Suicidal Behavior as a Function of School Student Connectedness.

In addition, random slopes on school student connectedness were regressed showing that school student connectedness moderated the effects of cybervictimization on all three mental health indicators. Simple slope analyses for low (-1 SD) and high (+1 SD) levels of school student connectedness revealed that in schools with lower levels of student connectedness, cybervictimization was associated with increases in suicidal behavior ($b = 2.17, SE = 0.34, t = 6.32, p < .001$), and symptoms of depression ($b = 4.23, SE = 0.60, t = 7.05, p < .001$). However, in schools with high school student connectedness, suicidal behavior ($b = 0.12, SE = 0.45, t = 0.26, p = .79$) and depression ($b = 1.16, SE = 0.79, t = 1.47, p = .14$) did not vary as a function of cybervictimization. Figures 1 and 2 provide a graphical representation of these interactions. Moreover, as shown in Figure 3, in schools with lower levels of student connectedness, cybervictimized adolescents also reported lower levels of self-esteem ($b = -4.66, SE = 0.74, t = -6.26,$

Table 2. Multilevel Modeling to Predict Mental Health Indicators

Predictors	Suicidal Behavior				Depression				Self-esteem			
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2	
	C	t-ratio	C	t-ratio	C	t-ratio	C	t-ratio	C	t-ratio	C	t-ratio
Student level												
Age	0.04	0.66	0.04	0.72	0.15	1.67	0.17	1.84	-0.06	-0.61	-0.08	-0.70
Gender	0.66	5.63***	0.67	5.72***	1.78	9.21***	1.80	9.31***	-3.14	-13.08***	-3.17	-13.18***
SES	-0.18	-4.99***	-0.18	-5.09***	-0.31	-5.19***	-0.32	-5.32***	0.40	5.31***	0.40	5.42***
Student Connectedness	-0.22	-7.84***	-0.23	-7.88***	-0.62	-13.12***	-0.62	-13.16***	0.68	11.38***	0.68	11.41***
Victim	0.33	2.17*	0.33	2.15*	1.07	4.22***	1.06	4.20**	-1.36	-4.27***	-1.34	-4.22***
Bully	-0.23	-1.03	-0.22	-0.98	0.18	0.49	0.06	0.17	0.58	1.26	0.61	1.30
Cybervictim	1.12	4.79***	1.17	5.00***	2.43	6.29***	2.49	6.46***	-2.65	-5.50***	-2.72	-5.65***
Cyberbully	0.73	2.55*	0.75	2.61**	2.24	4.71***	2.18	4.59***	-1.56	-2.63*	-1.51	-2.56*
School level												
Number of students			-0.00	-1.32			-0.00	0.68			-0.00	0.16
Minority proportion			2.70	2.23*			1.19	0.67			-1.27	-0.73
SSC			-0.32	-1.51			-0.57	-1.78			0.58	1.73
Cross-level interactions												
Victim × SSC			0.03	0.08			0.08	0.16			-0.01	-0.01
Bully × SSC			0.11	-0.24			1.67	2.08*			-0.78	-0.79
Cybervictim × SSC			-1.57	-3.16**			2.34	-2.84**			2.56	3.08**
Cyberbully × SSC			0.76	1.35			0.12	-0.13			0.20	0.17

Note. Variables at level 1 (except gender, victim, bully, cybervictim, and cyberbully) are centered around the group mean. Variables at level 2 are centered around the grand mean. C = Coefficient estimate from the population-average models with robust standard errors. SSC = School Student Connectedness. * $p < .05$, ** $p < .01$, *** $p < .001$.

$p < .001$), whereas self-esteem in schools with high levels of student connectedness did not vary as a function of cybervictimization ($b = -1.19, SE = 0.98, t = -1.21, p < .23$).

in schools with low levels of student connectedness ($b = -0.74, SE = 0.63, t = -1.17, p = .24$), as illustrated in Figure 4.

Discussion

Guided by the social-ecological approach (Bradshaw, 2015; Hymel & Swearer, 2015) and the Social Developmental Model (Catalano et al., 2004), this study was designed to analyze the role of individual and school variables in the relationship between bullying and cyberbullying and suicidal behavior, depression, and self-esteem in students. Moreover, this study examined the potential buffering role of school student connectedness on these mental health outcomes. Thereby, this study pretends to extend prior research on bullying and cyberbullying outcomes, and to fill a critical gap in the literature regarding the school environment as a support system.

Regarding our first research aim, based on previous studies, we expected both forms of bullying to be associated with increased risk of psychological adjustment. Nonetheless, our findings suggest that victimization, cybervictimization, and cyberbullying, but not traditional bullying, were positively associated with suicidal behavior and depression, and were negatively associated with self-esteem. These results were obtained after controlling for student age, gender, and SES, and are consistent with prior evidence that victimization, cyberbullying, and cybervictimization are related with poorer mental health (Modecki et al., 2014; Katsaras et al., 2018; Kowalski et al., 2014; van Geel et al., 2018; Young-Jones et al., 2015). Of note, traditional bullying was not associated with any mental health indicators. Additional research is warranted to further examine the relationship between traditional bullying and psychological adjustment from a multilevel perspective.

In addition, our findings showed that high levels of student connectedness could play a protective role against the effects of bullying or cyberbullying in the students that experience it. Specifically, individual levels of student connectedness were negatively related to suicidal behavior and depression and were positively associated with self-esteem. Furthermore, our results regarding mental health outcomes concur with those from previous studies (Arango et al., 2018; Eugene et al., 2021; Kidger et al., 2012; Kim et al., 2020; Klinck et al., 2020). More importantly, our findings suggest that school levels of student connectedness influenced the impact of cybervictimization on the three mental health outcomes we measured, underlining the importance of studying the interactive processes among individual and contextual influences, and supporting the use of social-ecological models to understand and interpret cyberbullying (Bradshaw, 2015; Hymel & Swearer, 2015). However, it is important to mention that the school-level variation in the three mental health indicators was rather low (less than 10% for suicidal behavior and less than 3% for depression and self-esteem). Nevertheless, these percentages of between-school variance in mental health outcomes, especially for depressive symptomatology, have been found in previous studies (e.g., Joyce & Early, 2014).

This finding on the protective role of individual levels of student connectedness leads to the second aim of our study. According to our results, school student connectedness served as an important contextual factor for cybervictimization. The simple slopes derived from the interaction between school student connectedness and cybervictimization were significant for the three mental health indicators we used. School student connectedness significantly attenuated the risk of suicidal behavior, depression, and low self-esteem among cybervictims. For instance, the results indicated that a cybervictimized student was more likely to have a lower risk of suicidal behavior and depression, as well as higher self-esteem, if they attended a school with high levels of student connectedness.

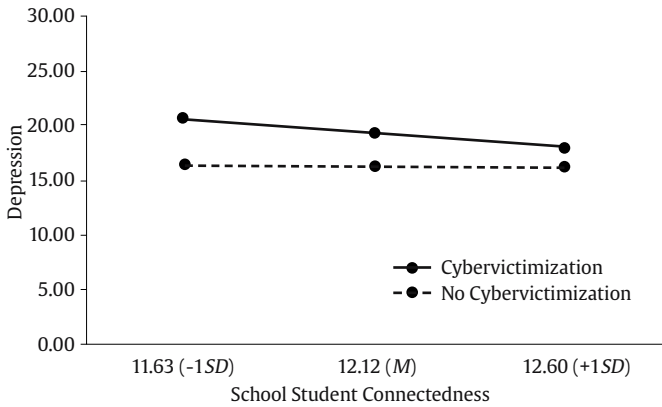


Figure 2. Association between Student Cybervictimization and Depression as a Function of School Student Connectedness.

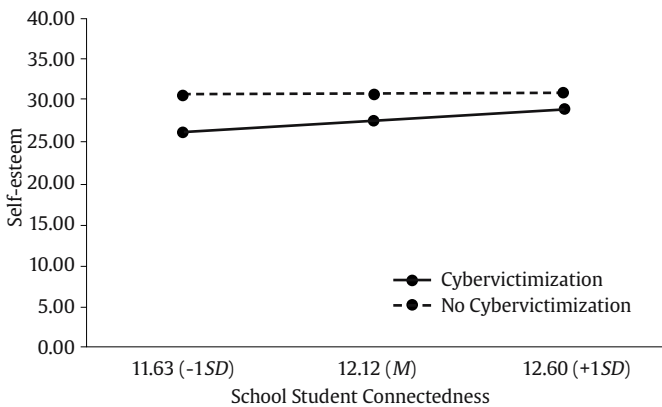


Figure 3. Association between Student Cybervictimization and Depression as a Function of School Student Connectedness.

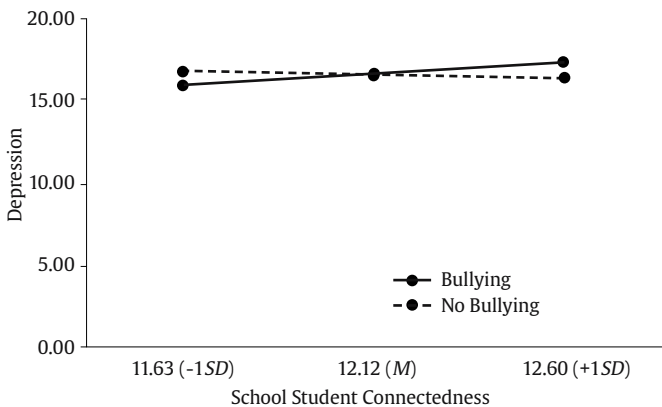


Figure 4. Association between Student Bullying and Depression as a Function of School Student Connectedness.

The school level of student connectedness also moderated the relationship between bullying and depression. Paradoxically, in schools with higher levels of student connectedness, being a traditional bully was positively associated with depression ($b = 1.49, SE = 0.74, t = 2.03, p < .05$), while it was not associated with depression

A possible explanation for this result is that school student connectedness could increase a sense of belongingness and reduce the sense of isolation among victimized youth, meaning that these students would be less likely to endorse symptoms of suicidality, depression, or low self-esteem. Indeed, our study findings are consonant with the Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010). This theory posits that thwarted belongingness is a major factor in suicidal behavior when combined with a feeling that nothing can be done to overcome that lack of belongingness (Joiner, 2005; Van Orden et al., 2010). In that regard, previous studies have also shown the moderating role of school connectedness in the relationship between cybervictimization and suicide-risk behavior (Kim et al., 2020), although this research overlooked the multilevel nature of school connectedness.

Nevertheless, the finding that the school level of student connectedness could moderate the relationship between traditional bullying and depression is more difficult to explain from this interpretation framework given that the school sense of belongingness plays a protective role in preserving mental health. In contrast to our expectations, our results revealed that the school level of student connectedness worsened the effect that traditional bullying had on depression. Our results indicated that students who bully were more likely to report higher levels of depression when they were in schools with high levels of student connectedness. Taking the Social Development approach (Catalano et al., 2004), one possible explanation for this result is that bullying is more likely to be a rejected and non-normative behavior in schools with high levels of student connectedness (Saarento et al., 2015; Waasdorp & Bradshaw, 2018). Therefore, the psychological need for relatedness that may underlie the bullying behavior would remain unsatisfied (Baumeister & Leary, 1995). This, in turn, may lead the bully student to experience feelings of loneliness and self-blaming and therefore, put them at a higher risk of depression (Young et al., 2015). However, this is a tentative explanation that should be further explored in future work. In addition, our findings revealed that the school level of student connectedness played a protective role for cybervictimization but not for traditional victimization. Thus, more research is needed to further understand the relationship between school student connectedness and mental health outcomes for both bullying and cyberbullying victims and perpetrators.

Limitations and Future Research

Several limitations of the current study should be noted. First, the results were based on a cross-sectional design and so we cannot draw any conclusions about the direction of the effect. Future studies should examine these relationships with longitudinal data in order to determine whether negative mental health outcomes (i.e., suicidal ideation, depression, and low self-esteem) are pre-existing or are a result of the impact of bullying and cyberbullying. Second, despite the stratified random sampling approach we used, the sample was limited to Spanish adolescents from one autonomous community, therefore impacting the generalizability of our findings. Third, the assessment of the study variables (e.g., bullying, cyberbullying, depression, etc.) was based solely on self-reported information which could have contributed to reporting biases. In addition, these measures should acknowledge for the multidimensional of some of the studied constructs (e.g., self-esteem; Estévez et al., 2006). Finally, this study focused on a reduced number of school-level variables (e.g., number of students, proportion of minorities, school level of student connectedness), and so future research could consider the potential buffering role for other contextual factors such as school climate, teacher responses to bullying, and parental support, among others.

Conclusions and Implications

Despite its limitations, this current study adds some important knowledge to the limited literature about the protective role school variables play in moderating the effect of bullying and cyberbullying on mental health outcomes. It also clearly supports the need for a social-ecological approach changing the focus from the individual who can suffer or exert bullying or cyberbullying, to the context where these phenomena occur. Taken together, our findings suggest that school levels of student connectedness can influence the degree to which cybervictimization adolescents present several mental health indicators. Indeed, our findings could help to inform the design of prevention programs. Specifically, these results highlight the potential protective role of schools and the need to develop positive relationships and foster an environment of support and cohesion as an integral component of school-based prevention of cyberbullying. That is, our results support the idea that antibullying interventions should, indeed, include universal actions (i.e., activities that target the whole school). Furthermore, our findings show that feeling of social belonging is crucial for creating a safe and healthy school environment.

Conflict of Interest

The authors of this article declare no conflict of interest.

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