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Bullying among adolescents: are the victims also perpetrators?

Andressa **Reisen**,[1] (iD) Maria C. **Viana**,[1,2] Edson T. dos **Santos-Neto**[1,2]

[1]*Programa de Pós-Graduação em Saúde Coletiva, Universidade Federal do Espírito Santo (UFES), Vitória, ES, Brazil.* [2]*Departamento de Medicina Social, UFES, Vitória, ES, Brazil.*

Objective: To analyze factors associated with the prevalence of maltreatment and bullying and to identify types of involvement (verbal, physical, social, sexual, cyberbullying) among high school students aged 15 to 19 years.
Methods: A cross-sectional, school-based epidemiological survey was performed. The sample included 2,293 adolescents from public and private schools in the Greater Vitoria area (state of Espírito Santo, Brazil). A modified version of the Brazilian Portuguese Olweus Bully/Victim Questionnaire was used.
Results: Among maltreatment behaviors, 43.3% of adolescents reported having been victims vs. 40.4% reporting to be aggressors. Among bullying behaviors, 41% reported victimization and 29.1% aggression. The most frequent types of bullying were verbal (victim = 33.8%, bully = 23.1%), social (victim = 21.8%, bully = 16.9%), and physical bullying (victim = 15.1%, bully = 8.7%). Of those reporting to be victims, 37.5% stated that they did not react as frequently as they were attacked. Almost half of the students (50.9%) identified themselves as victims, without practicing any type of aggression against another schoolmate. School network (public or private) and gender were significantly associated with victimization and aggression behaviors.
Conclusion: The adolescents identified as victims did not generally attack other students, i.e., did not identify themselves as perpetrators. The high prevalence of maltreatment and bullying detected in this study, especially the verbal, social, and physical types, underscores the need for interventions addressing bullying in schools.

Keywords: Adolescent; bullying; adolescent behavior; schools; violence

Introduction

Violence is a growing problem around the world, and its signs are also felt in the school environment. In schools, bullying is one of its most visible forms of violence,[1-3] associated with deleterious consequences for the physical and mental health of the individuals involved,[4,5] possibly hindering intellectual development and compromising the social potential of children and adolescents.[1,6]

Bullying involves aggressive attitudes by one or more students against another, characterized by intentionality, repetition, and power asymmetry.[1-4] It involves different forms of behaviors, according to which students may be classified as aggressors, victims, victim-aggressors, and witnesses, based on their attitude.[1,2] Bullying has also been categorized according to the type of event and forms of manifestation: physical, verbal, social, sexual, and cyberbullying.[4,5,7,8] When these aggressive behaviors occur less frequently, they are called maltreatment.[4]

Scientific studies carried out in Brazil have revealed a broad variation in the prevalence of bullying behaviors.

A pioneering study including more than 5,000 students in the city of Rio de Janeiro (state of Rio de Janeiro) performed in 2002 and 2003 by the Brazilian Multiprofessional Association for the Protection of Children and Adolescents (Associação Brasileira Multiprofissional de Proteção à Infância e à Adolescência [ABRAPIA]) revealed that 16.9% of the students reported having been victims of bullying, while 12.7% were characterized as bullying abusers.[1] Research carried out in the city of Esteio, state of Rio Grande do Sul, in 2009 showed that among the evaluated students, 56.9% were victims of bullying and 38.5% were perpetrators of bullying.[9] These results agree the high prevalence identified in a study conducted in the Rio Grande do Sul state capital Porto Alegre in the same year, which showed 67.5 and 54.7% for victims and aggressors respectively.[2] The results of a study carried out in the city of Olinda, state of Pernambuco, in 2012 indicated that almost half of adolescents aged 13 to 19 years were victims of bullying, while approximately one-third showed aggressive behavior.[5]

Bullying behaviors have attracted growing attention and interest from researchers and society over the past years. Understanding bullying in its various aspects is essential to ensure the optimal biopsychosocial development of children and adolescents, by providing them with a healthy, safe, and violence-free environment.[1,5,6,10]

According to the World Health Organization (WHO),[11] adolescence encompasses the second decade of life (10 to 19 years of age), and can be divided into two periods: pre-adolescence, 10 to 14 years of age; and adolescence, 15 to 19 years of age (late adolescence). It is a period characterized by profound biological, cognitive, emotional, and social changes, associated with a greater occurrence of bullying.[2,12,13] However, studies that address bullying in late adolescence are less frequent in Brazil.[1,10,13,14] In this sense, investigations addressing bullying in late adolescence are required for the understanding of determinants and constraints, in order to produce effective prevention interventions.

This study aims to identify the factors associated with the prevalence of maltreatment and bullying victimization and aggression, as well as to describe the types of involvement (verbal, physical, social, sexual, cyberbullying) in late adolescence (15 to 19 years), in students enrolled in public and private high schools in the Greater Vitória Area (Região Metropolitana da Grande Vitória – state of Espírito Santo [RMGV-ES]), Brazil.

Methods

Study design

A cross-sectional, school-based epidemiological survey was performed with a sample of students enrolled in high schools in the RMGV-ES in 2016 and 2017. The RMGV-ES is home to approximately 48% (1.6 million inhabitants) of the state population, including about 148,000 adolescents aged 15 to 19 years.[15] It comprises seven municipalities, with Human Development Index (HDI) ranging from 0.686 to 0.845.[16] According to the Espírito Santo State Department of Education, as of 2014, the RMGV-ES had 168 high schools and 65,763 regularly enrolled students. Secondary education concentrates students aged 15 to 19 years in Brazil (Law 9,394/1996), corresponding to the group covered in the present study. This study used data from the surveillance of risk factors for diseases and injuries in adolescents aged 15 to 19 years in the RMGV-ES database, which aimed to measure the exposure of this group to different risk behaviors, diseases, and injuries that can affect their full development and impact their physical and mental health.

Inclusion and exclusion criteria

All students aged 15 to 19 years, regularly enrolled in state public or private high schools located in the RMGV-ES, and bearing no cognitive, auditory, or visual impairment that could prevent their active participation in the study, were eligible to participate. All the students who agreed to participate, who signed a consent and/or assent form, and who effectively answered the research instrument were included.

Sampling and data collection

The sample was stratified according to municipality. Proportional sample quotas were calculated to match the distribution of students per municipality of the RMGV-ES. In order to determine the sample size, the following were considered: prevalence of bullying of 56.9% for victimization and 38.5% for aggression, based on Silva et al.,[9] 95% confidence interval (95%CI), margin of error of 2.5%, and design effect of 1.5.

According to the proportion of students enrolled per municipality of the RMGV-ES (Cariacica = 19.3%; Fundão = 0.5%; Guarapari = 5.8%; Serra = 23.2%; Viana = 3.7%; Vila Velha = 22.7%; Vitória = 24.8%), the number of adolescents to be interviewed was defined. All schools providing high school education in the RMGV-ES in 2014 were numbered consecutively in each municipality. A simple random sample selection of schools was performed using the BioEstat version 5.4 program according to the target proportion of each municipality.

The final sample included 2,293 participants. Data collection was carried out by trained investigators in 54 schools (43 public, 11 private). Students completed a closed interview on a laptop computer during selected classes, in the morning and afternoon shifts. Specific software for online and offline data collection was developed.

Instruments and variables

The factors analyzed in this investigation included socio-demographic variables – age (15 to 19 years), gender (male, female), race/skin color (Caucasian, black, brown, Asian, indigenous) – type of school (public, private), school shift (morning, afternoon), and high school grade (1st, 2nd, 3rd, 4th grades).

In order to assess bullying, a modified Brazilian version of the Olweus Bully/Victim Questionnaire[4] was adopted, which includes the victim and bully versions. The modified version does not present a definition of bullying to the students being surveyed. Victims and bullies are categorized according to the self-reported frequency of attitudes that characterize these behavior in the past 12 months. The type of manifestation is also recorded, namely, physical, verbal, social, or psychological, sexual, and cyberbullying.[4,8,17-19] The questionnaire is a Likert-type scale with six response options (0 = never happened; 1 = happened once or twice in the past 12 months; 2 = happened three to six times in the past 12 months; 3 = happened once a week; 4 = happened several times a week; and 5 = happened every day), for a total of 48 questions. Of these, 24 items investigate the frequency of victimization in the past 12 months, and 24 items relate to aggressions practiced in the same period.[4,8,18]

The psychometrics properties[20] of the adapted instrument were analyzed. They revealed, for the items of the victimization scale, a mean ± standard deviation (SD) of 0.423±0.537, and, for the aggression scale, a mean ± SD

of 0.261±0.432. The correlations between each item and the overall value of the scale ranged between 0.284 and 0.689 on the victimization scale and between 0.320 and 0.720 for aggression. Cronbach alpha values = 0.887 (victimization scale) and 0.888 (aggression scale) were obtained. The internal consistency of the total items was considered satisfactory for this sample (Table 1).

We proposed an alternative classification in order to capture an in-depth view of how students perceive the issue of aggression/victimization. Thus, the term mal-treatment[4] (*maus tratos*, in Portuguese) was used to refer to violent acts among students happening frequently, up to six times in the past 12 months; and the term bullying was used to refer to aggressive behaviors among

Table 1 Psychometric properties of bullying victimization and aggression scales

Scale/item	n	Mean (SD)	Corrected total item Pearson correlation	Square multiple correlation	Cronbach alpha if the item is deleted
Victimization scale					
I was punched, kicked or shoved.	2,278	0.362 (0.850)	0.515	0.326	0.883
I was scratched or my hair was pulled.	2,279	0.260 (0.740)	0.488	0.316	0.884
I was threatened.	2,278	0.318 (0.778)	0.570	0.360	0.882
I was forced to give away my money or my things.	2,281	0.043 (0.334)	0.284	0.144	0.888
Somebody snatched my money or belongings.	2,280	0.563 (1.147)	0.565	0.405	0.882
Somebody broke my stuff.	2,280	0.626 (1.139)	0.567	0.414	0.882
I was cursed.	2,282	1.438 (1.775)	0.647	0.377	0.883
I was insulted because of my color or race.	2,283	0.336 (1.024)	0.508	0.215	0.884
I was insulted because of a physical trait.	2,282	0.847 (1.399)	0.644	0.387	0.880
I was humiliated because of my sexual orientation or mannerisms.	2,281	0.163 (0.722)	0.412	0.185	0.885
Somebody mocked my accent.	2,281	0.378 (1.097)	0.450	0.171	0.886
Somebody laughed and pointed at me.	2,277	0.729 (1.306)	0.682	0.430	0.878
Somebody gave me nicknames I didn't like.	2,277	0.743 (1.378)	0.689	0.444	0.878
I was pushed (trapped) against the wall.	2,282	0.104 (0.549)	0.495	0.358	0.884
I was harassed in or out of school.	2,280	0.121 (0.557)	0.524	0.394	0.884
I was sexually harassed.	2,279	0.136 (0.653)	0.339	0.261	0.887
Somebody sexually abused me.	2,280	0.025 (0.311)	0.277	0.261	0.887
Somebody would not let me be with my peers.	2,280	0.364 (0.961)	0.606	0.450	0.881
I was totally ignored by others.	2,281	0.509 (1.080)	0.612	0.464	0.881
Somebody falsely accused me of snitching things from my classmates.	2,281	0.470 (1.064)	0.567	0.304	0.882
Somebody said nasty things about my family or me.	2,279	0.485 (1.033)	0.670	0.447	0.879
Somebody tried to make others dislike me.	2,277	0.701 (1.258)	0.650	0.427	0.879
I was forced to assault a classmate.	2,279	0.102 (0.541)	0.409	0.254	0.885
Somebody used the Internet or a cell phone to cyberattack me.	2,279	0.238 (0.776)	0.512	0.287	0.883
Global Cronbach's alpha					0.887
Aggression scale					
I punched, kicked and shoved someone.	2,281	0.34 (0.909)	0.582	0.374	0.882
I scratched someone or pulled someone's hair.	2,279	0.21 (0.656)	0.432	0.239	0.885
I threatened a schoolmate.	2,280	0.25 (0.801)	0.610	0.373	0.881
I forced someone to give away his/her money or things.	2,281	0.06 (0.448)	0.478	0.371	0.885
I took someone's money or stuff without his/her permission.	2,281	0.14 (0.645)	0.477	0.293	0.884
I ruined someone's things.	2,281	0.25 (0.734)	0.566	0.333	0.882
I cursed someone.	2,281	1.12 (1.682)	0.656	0.374	0.887
I insulted someone because of his color or race.	2,280	0.16 (0.751)	0.525	0.380	0.883
I insulted someone because of some physical characteristic.	2,279	0.35 (0.965)	0.653	0.457	0.880
I humiliated someone because of his sexual orientation or mannerism.	2,279	0.11 (0.564)	0.534	0.389	0.883
I made fun at someone because of his accent.	2,279	0.36 (0.980)	0.542	0.281	0.883
I laughed and pointed at someone.	2,279	0.52 (1.175)	0.700	0.471	0.878
I called someone shameful nicknames.	2,279	0.45 (1.109)	0.720	0.507	0.877
I pushed someone against the wall.	2,279	0.09 (0.489)	0.540	0.394	0.884
I harassed someone in or out of school.	2,279	0.06 (0.418)	0.483	0.443	0.885
I sexually harassed someone.	2,279	0.05 (0.396)	0.339	0.313	0.887
I sexually abused someone.	2,279	0.02 (0.247)	0.320	0.467	0.888
I would not let someone be in the peer group.	2,279	0.26 (0.773)	0.567	0.377	0.882
I ignored someone completely.	2,279	0.68 (1.200)	0.567	0.341	0.884
I made up that someone took things from someone else.	2,279	0.17 (0.691)	0.575	0.360	0.882
I said nasty things about someone or his/her family.	2,278	0.22 (0.775)	0.615	0.374	0.881
I made or tried to make others dislike a schoolmate.	2,277	0.20 (0.696)	0.475	0.314	0.884
I forced someone to assault another schoolmate.	2,278	0.08 (0.478)	0.539	0.380	0.884
I used the internet or cell phone to virtually attack someone.	2,278	0.13 (0.609)	0.490	0.255	0.884
Global Cronbach's alpha					0.888

Source: Students aged 15 to 19 from the Greater Vitória Area (Região Metropolitana da Grande Vitória - state of Espírito Santo [RMGV-ES]), Brazil.

students occurring more than six times during the past 12 months. The classification method was adapted from Fischer et al.[4]

The construct proposed in this study considered the frequency of the episodes, both in the victim and bully version. For each respondent, regardless of the number of repetitions of the response, the highest frequency defined the classification. The subjects were categorized as: never happened, maltreatment (once to six times in the past 12 months), frequent bullying (once a week), very frequent bullying (several times a week) and daily bullying (every day). Based on this classification, the total of victimization and perpetration was constructed. The types of bullying behavior (victim and bully) were also considered, and were categorized into physical, verbal, social or psychological, sexual, or cyberbullying. The concordance between victimization and aggression was also analyzed.

Pilot study

A pilot study was carried out to ensure uniformity and standardization of data collection. The form was tested using the test and retest method in two steps, with a 21-day interval between the administrations. In the first phase, it was administered to 46 adolescents aged 15 to 19 years (not included in the main study); and in the second phase, it was re-administered to the same students in order to verify inconsistencies regarding the adolescents' responses. When submitting the instrument questions to the kappa test,[21] adjusted for prevalence, the results showed a variation from 0.71 to 1.0. The McNemar test was also used in order to assess the existence of any discordance tendency between the first and the second administration of the instruments. No statistically significant discordance was detected except for the variable "I was cursed," which demonstrated a tendency of significant discordance (p = 0.01).

Statistical analysis

Data were analyzed using SPSS version 21.0. Absolute and relative frequencies were calculated for all the variables analyzed. The Pearson's chi-square test was used to test the associations between bullying and sociodemographic characteristics. A multinomial logistic regression analysis was performed including the outcome variables victimization and aggression and the independent variables with statistical significance < 5% in the final model. The never happened category was used as reference, whereas adolescent age and high school grade worked as covariates.

Ethical aspects

The study was approved by the health research ethics committee at Universidade Federal do Espírito Santo (UFES) (Resolution 971,389/2015) and met all ethical parameters. All participants signed an informed consent or assent form. Participants younger than 18 years of age were also required to have the informed consent form signed by their parents or legal guardians.

Results

The final sample included 2,293 adolescents, with 60% of females, 55.6% aged 15 to 16 years (mean age: 16.42± 1.141), and 45.4% reporting brown race/skin color. Among the participants, 88% were public school students, 82.1% were enrolled in the morning shift, and almost half (47.7%) attended the first year of high school (Table 2).

The distribution of bullying victimization/perpetration and of sociodemographic characteristics among adolescents is shown in Table 2. Younger adolescents reported greater bullying victimization than their older counterparts (p = 0.009), with no age-specific distribution among bullies (p = 0.282). The same occurred in relation to school grade, which is linked to age. Female students reported greater involvement in bouts of maltreatment, while males reported more involvement in episodes of bullying. As far as shift is concerned, the presence of maltreatment and bullying was higher in the morning shift (p = 0.005), with no differences in distribution per shift among the victims. Private school students reported more victimization and aggression from maltreatment and bullying than their public school counterparts. It was observed that race/skin color did not impact the differential distribution of events.

Table 3 shows the final regression model. In the victimization model, the age variable was included as covariate; and in the aggression model, the variable high school grade was included as covariate, since these variables presented a significant correlation with victimization and aggression (R^2 = 0.596; p < 0.001). Based on the category never happened, and considering victimization, the following were associated with bullying: school network (p = 0.030, odds ratio [OR] = 0.632, 95%CI 0.417-0.957) and gender (p < 0.001, OR = 0.624, 95%CI 0.485-0.802). The variable high school grade was excluded from the final model of victimization because of the interaction with the variable age. Regarding aggression, school network was significantly associated with maltreatment (p < 0.001, OR = 0.500, 95%CI 0.355-0.706) and bullying (p < 0.001; OR = 0.508; 95%CI 0.351-0.734), whereas gender (p < 0.001, OR = 0.441, 95%CI 0.353-0.734) and school shift (p = 0.039, OR = 1.350, 95%CI 1.015-1.795) were statistically associated with bullying only.

Table 4 shows the results for bullying victimization. When observing the total number of victims, 84.3% (n=1,926) of the adolescents reported some victimization in the past 12 months. Out of this total, 41% reported having been bullied.

When analyzing the types of bullying victimization, we observed that verbal victimization was the most significant, involving 33.8% of students, followed by social victimization (21.8%) and physical victimization (15.1%). Sexual bullying and cyberbullying were identified in 2 and 2.7% of the victims respectively.

In verbal victimization, the most frequent item for reporting maltreatment (31%) and bullying (24.5%) was "I was cursed." The item of social victimization "Somebody laughed and pointed at me" concentrated more

Table 2 Distribution of victimization and aggression for maltreatment and bullying according to sociodemographic characteristics among adolescents, VIGIADOLEC, RMGV-ES, 2016/2017

	Never happened	Maltreatment	Bullying	p-value
Victimization				
Age, years (n=2,282)	356 (15.6)	989 (43.3)	937 (41.1)	
15 (n=588)	89 (15.0)	235 (40.0)	264 (45.0)	0.009*
16 (n=680)	85 (12.5)	293 (43.1)	302 (44.4)	
17 (n=577)	102 (17.7)	265 (45.9)	210 (36.4)	
18 (n=346)	66 (19.1)	153 (44.2)	127 (36.7)	
19 (n=91)	14 (15.4)	43 (47.3)	34 (37.4)	
Gender (n=2,282)	356 (15.6)	989 (43.3)	937 (41.1)	
Female (n=1,369)	222 (16.2)	663 (48.4)	484 (35.4)	< 0.001*
Male (n=779)	134 (14.7)	326 (35.7)	453 (49.6)	
Race/skin color (n=2,280)[†]	356 (15.6)	988 (43.3)	936 (41.1)	
Caucasian (n=653)	104 (15.9)	275 (42.1)	274 (42.0)	0.722*
Black (n=403)	56 (13.9)	173 (42.9)	174 (43.2)	
Brown (n=1,036)	160 (15.4)	456 (44.0)	420 (40.5)	
Asian (n=145)	29 (20.0)	66 (45.5)	50 (34.5)	
Indigenous (n=43)	7 (16.3)	18 (41.9)	18 (41.9)	
School network (n=2,281)[†]	356 (15.6)	988 (43.3)	937 (41.1)	
Public (n=2,006)	325 (16.2)	872 (43.5)	809 (40.3)	0.047*
Private (n=275)	31 (11.3)	116 (42.2)	128 (46.5)	
Shift (n=2,269)	356 (15.7)	979 (43.1)	934 (41.2)	
Morning (n=1,862)	287 (15.4)	803 (43.1)	772 (41.5)	0.698*
Afternoon (n=407)	69 (17.0)	176 (43.2)	162 (39.8)	
High school grade (n=2,282)	356 (15.6)	989 (43.3)	937 (41.1)	< 0.001*
First (n=1,089)	158 (14.5)	434 (39.9)	497 (45.6)	
Second (n=615)	89 (14.5)	271 (44.1)	255 (41.5)	
Third (n=556)	104 (18.7)	275 (49.5)	177 (31.8)	
Fourth (n=22)	5 (22.7)	9 (40.9)	8 (36.4)	
Aggression				
Age, years (n=2,281)[†]	699 (30.6)	920 (40.3)	660 (29.1)	
15 (n=588)	176 (29.9)	219 (37.2)	193 (32.8)	0.282*
16 (n=680)	198 (29.1)	285 (41.9)	197 (29.0)	
17 (n=576)	180 (31.3)	236 (41.0)	160 (27.8)	
18 (n=346)	118 (34.1)	138 (39.9)	90 (26.0)	
19 (n=91)	27 (29.7)	42 (46.2)	22 (24.2)	
Gender (n=2,281)[†]	699 (30.6)	920 (40.3)	660 (29.1)	
Female (n=1,368)	464 (33.9)	599 (43.8)	305 (22.3)	<0.001*
Male (n=913)	235 (25.7)	321 (35.2)	357 (39.1)	
Race/skin color (n=2,279)[†]	699 (30.7)	920 (40.4)	660 (28.9)	
Caucasian (n=653)	198 (30.3)	264 (40.4)	191 (29.2)	
Black (n=403)	120 (29.8)	157 (39.0)	126 (31.3)	0.294*
Brown (n=1,036)	321 (31.0)	418 (40.3)	297 (28.7)	
Asian (n=145)	50 (34.5)	66 (45.5)	29 (20.0)	
Indigenous (n=42)	10 (23.8)	15 (35.7)	17 (40.5)	
School network (n=2,280)[†]	699 (30.7)	920 (40.4)	660 (28.9)	
Public (n=2,005)	648 (32.3)	789 (39.4)	568 (28.3)	<0.001*
Private (n=275)	51 (18.5)	131 (47.6)	93 (33.8)	
Shift (n=2,268)[†]	696 (30.7)	913 (40.3)	659 (29.0)	
Morning (n=1,861)	544 (29.2)	760 (40.8)	557 (29.9)	0.005*
Afternoon (n=407)	152 (37.3)	153 (37.6)	102 (25.1)	
High school grade (n=2,281)[†]	699 (30.6)	920 (40.3)	662 (29.1)	
First (n=1,088)	339 (31.2)	400 (36.8)	349 (32.1)	0.007[‡]
Second (n=615)	163 (26.5)	278 (45.2)	174 (28.3)	
Third (n=556)	187 (33.6)	232 (41.7)	137 (24.6)	
Fourth (n=22)	10 (45.5)	10 (45.5)	2 (9.1)	

Data presented as n (%).
RMGV-ES = Região Metropolitana da Grande Vitória – state of Espírito Santo; VIGIADOLEC = Surveillance of risk factors for diseases and grievances in adolescents aged 15 to 19 years in the Greater Vitória Area.
* Pearson's chi-square test.
[†] Variables that do not add up to n=2,282 reflect the absence of valid answers for analysis.
[‡] Linear-by-linear association test.

Table 3 Multivariate analysis of victimization and bullying outcomes in relation to the absence of episodes, VIGIADOLEC, RMGV-ES, 2016/2017

Scale/category	B	SE	Wald	Design effect	p-value	OR	95%CI
Victimization							
Maltreatment*							
Intercept		0.908	3.158	1	0.076		
Age[†]	-0.026	0.054	0.238	1	0.626	0.974	0.876-1.083
School network							
Public	-0.323	0.213	2.287	1	0.130	0.724	0.477-1.100
Private						1	
Gender							
Female	0.202	0.129	2.440	1	0.118	1.224	0.950-1.576
Male						1	
Bullying*							
Intercept	4.314	0.922	21.901	1	0.000		
Age[†]	-0.162	0.055	8.740	1	0.003	0.850	0.763-0.947
School network							
Public	-0.460	0.212	4.695	1	0.030	0.632	0.417-0.957
Private						1	
Gender							
Female	-0.472	0.128	13.510	1	0.000	0.624	0.485-0.802
Male						1	
Aggression							
Maltreatment*							
Intercept	0.661	0.247	7.156	1	0.007		
High school grade[†]	0.033	0.059	0.301	1	0.583	1.033	0.920-1.160
School network							
Public	-0.692	0.176	15.552	1	0.000	0.500	0.355-0.706
Private						1	
Gender							
Female	-0.039	0.107	0.134	1	0.714	0.962	0.780-1.186
Male						1	
Shift							
Morning	0.243	0.129	3.543	1	0.060	1.275	0.990-1.643
Afternoon						1	
Bullying*							
Intercept	1.069	0.267	16.096	1	0.000		
High school grade[†]	-0.171	0.067	6.580	1	0.010	0.843	0.740-0.961
School network							
Public	-0.678	0.188	12.974	1	0.000	0.508	0.351-0.734
Private						1	
Gender							
Female	-0.819	0.113	52.806	1	0.000	0.441	0.353-0.550
Male						1	
Shift							
Morning	0.300	0.145	4.255	1	0.039	1.350	1.015-1.795
Afternoon						1	

95%CI = 95% confidence interval; B = beta coefficient; OR = odds ratio; RMGV-ES = Região Metropolitana da Grande Vitória – state of Espírito Santo; SE = standard error; VIGIADOLEC = surveillance of risk factors for diseases and grievances in adolescents aged 15 to 19 years in the Greater Vitória Area.
* Never happened is the reference category for multinomial logistic regression.
[†] Covariate: age (victimization); high school grade (aggression).

reports of bullying (10.4%) and the item "Somebody tried to make others dislike me" had more reports of maltreatment (25.9%). As for physical victimization, it is noted that the most frequent response was destruction of property ("Somebody broke my stuff") both for maltreatment (27.5%) and for bullying (7.8%). Regarding sexual harassment, 1.9% (n=44) reported having undergone some of bullying. As for cyberbullying, 2.7% (n=64) chose responses that characterized bullying victimization.

Regarding aggressive behaviors, a total of 40.4% (n=920) reported aggression for maltreatment and 29.1% (n=662) for bullying over the past 12 months (Table 5). Regarding

the type of bullying, the verbal type (23.1%) was most often perpetrated, followed by social (16.9%) and physical (8.7%) bullying. Sexual bullying and cyberbullying were detected in 0.9% (n=18) and 1.8% (n=40) respectively.

The item of verbal aggression "I cursed another classmate" was the most frequent (maltreatment = 24.3%, bullying = 19.2%). Social bullying was practiced by 8.7% through ignoring a classmate. As for physical bullying, most students reported having "punched, kicked and shoved someone." In the sexual type, it was observed that 0.8% (n=17) of the students practiced bullying according to the question "I sexually harassed someone."

Table 4 Victimization behavior among adolescents, VIGIADOLEC, RMGV-ES, 2016/2017

	Was not a victim [Never happened]	Maltreatment, n=989 (43.3%)		Bullying, n=937 (41%)		
		1-2 times in the past 12 months	3-6 times in the past 12 months	Frequent [Once a week]	Very frequent [Many times a week]	Daily [Occurred every day]
No. of victimization events*† (n=2,282 students)	356 (15.6)	683 (29.9)	306 (13.4)	124 (5.4)	292 (12.8)	521 (22.8)
Physical (n=2,282)	983 (43.1)	774 (33.9)	179 (7.8)	87 (3.8)	133 (5.8)	126 (5.5)
I was punched, kicked or shoved (n=2,278)	1,755 (77.0)	377 (16.5)	64 (2.8)	21 (0.9)	43 (1.9)	18 (0.8)
I was scratched or my hair was pulled (n=2,279)	1,906 (83.6)	270 (11.8)	39 (1.7)	24 (1.1)	27 (1.2)	13 (0.6)
I was forced to give away my money or my things (n=2,281)	2,223 (97.5)	42 (1.8)	4 (0.2)	2 (0.1)	5 (0.2)	5 (0.2)
Somebody snatched my money or belongings (n=2,280)	1,597 (70.0)	431 (18.9)	88 (3.9)	31 (1.4)	71 (3.1)	62 (2.7)
Somebody broke my stuff (n=2,280)	1,478 (64.8)	519 (22.8)	107 (4.7)	56 (2.5)	68 (3.0)	52 (2.3)
I was pushed (trapped) against the wall (n=2,282)	2,163 (94.8)	72 (3.2)	12 (0.5)	13 (0.6)	9 (0.4)	13 (0.6)
I was forced to assault a classmate (n=2,279)	2,162 (94.9)	69 (3.0)	13 (0.6)	15 (0.7)	8 (0.4)	12 (0.5)
Verbal (n=2,282)	635 (27.8)	641 (28.1)	234 (10.3)	114 (5.0)	243 (10.6)	415 (18.2)
I was cursed (n=2,282)	1,017 (44.4)	535 (23.4)	173 (7.6)	103 (4.5)	179 (7.8)	278 (12.2)
I was insulted because of my color or race (n=2,283)	1,964 (86.0)	147 (6.4)	47 (2.1)	20 (0.9)	49 (2.1)	56 (2.5)
I was insulted because of a physical trait (n=2,282)	1,402 (61.4)	432 (18.9)	153 (6.7)	73 (3.2)	120 (5.3)	102 (4.5)
Somebody mocked my accent (n=2,281)	1,938 (85.0)	152 (6.7)	50 (2.2)	24 (1.1)	45 (2.0)	72 (3.2)
Somebody gave me nicknames I didn't like (n=2,277)	1,530 (67.2)	376 (16.5)	110 (4.8)	55 (2.4)	97 (4.3)	109 (4.8)
Somebody said nasty things about my family or me (n=2,279)	1,667 (73.1)	384 (16.8)	96 (4.2)	48 (2.1)	37 (1.6)	47 (2.1)
Social or psychological (n=2,282)	781 (34.2)	746 (32.7)	257 (11.3)	117 (5.1)	159 (7.0)	222 (9.7)
I was threatened (n=2,278)	1,800 (79.0)	356 (15.6)	57 (2.5)	17 (0.7)	35 (1.5)	13 (0.6)
I was humiliated because of my sexual orientation or mannerisms (n=2,281)	2,122 (93.0)	75 (3.3)	24 (1.1)	11 (0.5)	26 (1.1)	23 (1.0)
Somebody laughed and pointed at me (n=2,277)	1,484 (65.2)	423 (18.6)	132 (5.8)	70 (3.1)	76 (3.3)	92 (4.0)
I was harassed in or out of school (n=2,280)	2,128 (93.3)	98 (4.3)	17 (0.7)	15 (0.7)	13 (0.6)	9 (0.4)
Somebody would not let me be with my peers (n=2,280)	1,839 (80.7)	279 (12.2)	56 (2.5)	34 (1.5)	24 (1.1)	48 (2.1)
I was totally ignored by others (n=2,281)	1,658 (72.7)	388 (17.0)	88 (3.9)	40 (1.8)	56 (2.5)	51 (2.2)
Somebody falsely accused me of snitching things from my classmates (n=2,281)	1,722 (75.5)	323 (14.2)	92 (4.0)	54 (2.4)	34 (1.5)	56 (2.5)
Somebody tried to make others dislike me (n=2,277)	1,481 (65.0)	435 (19.1)	155 (6.8)	60 (2.6)	57 (2.5)	89 (3.9)
Sexual (n=2,280)	2,142 (93.9)	65 (2.9)	28 (1.2)	9 (0.4)	14 (0.6)	22 (1.0)
I was sexually harassed (n=2,279)	2,143 (94.0)	65 (2.9)	27 (1.2)	9 (0.4)	14 (0.6)	21 (0.9)
Somebody sexually abused me (n=2,280)	2,263 (99.3)	2 (0.1)	4 (0.2)	4 (0.2)	1 (0.0)	6 (0.3)
Cyberbullying (n=2,279)	1,982 (87.0)	189 (8.3)	44 (1.9)	19 (0.8)	19 (0.8)	26 (1.1)
Somebody used the Internet or a cell phone to cyberattack me (n=2,279)	1,982 (87.0)	189 (8.3)	44 (1.9)	19 (0.8)	19 (0.8)	26 (1.1)

Data presented as n (%).
RMGV-ES = Região Metropolitana da Grande Vitória – state of Espírito Santo; VIGIADOLEC = surveillance of risk factors for diseases and grievances in adolescents aged 15 to 19 years in the Greater Vitória Area.
Variables that do not add up to n=2,282 reflect the absence of valid answers for analysis.
* Classification of types of victimization adapted.[6,7,11]
† Total number of victimization events per respondent according to the response options, classified by frequency of episodes.

Table 5 Aggressive behavior among adolescents, VIGIADOLEC, RMGV-ES, 2016/2017

	Maltreatment, n=920 (40.4%)			Bullying, n=662 (29.1%)		
	Was not a bully [Never happened]	1-2 times in the past 12 months	3-6 times in the past 12 months	Frequent [Once a week]	Very frequent [Many times a week]	Daily [Occurred every day]
No. of aggression events*† (n=2,281 students)	699 (30.6)	679 (29.8)	241 (10.6)	134 (5.9)	184 (8.1)	344 (15.1)
Physical (n=2,281)	1,418 (62.2)	556 (24.4)	107 (4.7)	73 (3.2)	62 (2.7)	65 (2.8)
I punched, kicked and shoved someone (n=2,281)	1,861 (81.6)	263 (11.5)	57 (2.5)	36 (1.6)	30 (1.3)	34 (1.5)
I scratched someone or pulled someone's hair (n=2,279)	1,977 (86.7)	216 (9.5)	41 (1.8)	19 (0.8)	14 (0.6)	12 (0.5)
I forced someone to give away his/her money or things (n=2,281)	2,222 (97.4)	27 (1.2)	11 (0.5)	6 (0.3)	4 (0.2)	11 (0.5)
I took someone's money or stuff without his/her permission (n=2,280)	2,117 (92.8)	96 (4.2)	22 (1.0)	11 (0.5)	18 (0.8)	17 (0.7)
I ruined someone's things (n=2,281)	1,920 (84.2)	268 (11.7)	35 (1.5)	21 (0.9)	17 (0.7)	20 (0.9)
I pushed someone against the wall (n=2,279)	2,185 (95.9)	43 (1.9)	19 (0.8)	19 (0.8)	6 (0.3)	7 (0.3)
I forced someone to assault another schoolmate (n=2,278)	2,191 (96.2)	44 (1.9)	19 (0.8)	10 (0.4)	3 (0.1)	11 (0.5)
Verbal (n=2,279)	1,040 (45.6)	536 (23.5)	174 (7.6)	124 (5.4)	133 (5.8)	272 (11.9)
I cursed someone (n=2,281)	1,291 (56.6)	426 (18.7)	127 (5.6)	93 (4.1)	116 (5.1)	228 (10.0)
I insulted someone because of his color or race (n=2,280)	2,141 (93.9)	61 (2.7)	19 (0.8)	12 (0.5)	9 (0.4)	38 (1.7)
I insulted someone because of some physical characteristic (n=2,279)	1,906 (83.6)	192 (8.4)	70 (3.1)	30 (1.3)	42 (1.8)	39 (1.7)
I made jokes at someone because of his accent (n=2,279)	1,860 (81.6)	245 (10.8)	62 (2.7)	39 (1.7)	20 (0.9)	53 (2.3)
I called someone shameful nicknames (n=2,279)	1,808 (79.3)	248 (10.9)	68 (3.0)	51 (2.2)	36 (1.6)	68 (3.0)
I said nasty things about someone or his/her family (n=2,278)	2,026 (88.9)	147 (6.5)	29 (1.3)	35 (1.5)	14 (0.6)	27 (1.2)
Social or psychological (n=2,280)	1,087 (47.7)	617 (27.1)	191 (8.4)	114 (5.0)	109 (4.8)	162 (7.1)
I threatened a schoolmate (n=2,280)	1,984 (87.0)	181 (7.9)	46 (2.0)	23 (1.0)	14 (0.6)	32 (1.4)
I humiliated someone because of his sexual orientation or mannerism (n=2,279)	2,160 (94.8)	62 (2.7)	20 (0.9)	17 (0.7)	5 (0.2)	15 (0.7)
I laughed and pointed at someone (n=2,279)	1,722 (75.6)	295 (12.9)	84 (3.7)	56 (2.5)	46 (2.0)	76 (3.3)
I harassed someone in or out of school (n=2,279)	2,210 (97.0)	39 (1.7)	12 (0.5)	6 (0.3)	4 (0.2)	8 (0.4)
I would not let someone be in the peer group (n=2,279)	1,931 (84.7)	245 (10.8)	40 (1.8)	21 (0.9)	15 (0.7)	27 (1.2)
I ignored someone completely (n=2,279)	1,464 (64.2)	482 (21.1)	134 (5.9)	69 (3.0)	63 (2.8)	67 (2.9)
I made up that someone took things from someone else (n=2,279)	2,076 (91.1)	119 (5.2)	33 (1.4)	16 (0.7)	13 (0.6)	22 (1.0)
I made or tried to make others dislike a schoolmate (n=2,277)	2,010 (88.3)	182 (8.0)	31 (1.4)	21 (0.9)	14 (0.6)	19 (0.8)
Sexual (n=2,279)	2,229 (97.8)	24 (1.1)	8 (0.4)	4 (0.2)	6 (0.3)	8 (0.4)
I sexually harassed someone (n=2,279)	2,231 (97.9)	23 (1.0)	8 (0.4)	4 (0.2)	6 (0.3)	7 (0.3)
I sexually abused someone (n=2,279)	2,266 (99.4)	6 (0.3)	2 (0.1)	0 (0.0)	0 (0.0)	5 (0.2)
Cyberbullying (n=2,278)	2,133 (93.6)	86 (3.8)	19 (0.8)	9 (0.4)	15 (0.7)	16 (0.7)
I used the internet or cell phone to virtually attack someone (n=2,278)	2,133 (93.6)	86 (3.8)	19 (0.8)	9 (0.4)	15 (0.7)	16 (0.7)

Data presented as n (%).
The variables that did not amounted to n=2,282 refer to the absence of valid answers for analysis.
RMGV-ES = Região Metropolitana da Grande Vitória – state of Espírito Santo; VIGIADOLEC = surveillance of risk factors for diseases and grievances in adolescents aged 15 to 19 years in the Greater Vitória Area.
* Classification of types of aggression adapted.[6,7,11]
† Total number of aggression per respondent according to the response options, classified by frequency of episodes.

In cyberbullying, 4.6% (n=105) chose responses that characterized maltreatment and 1.8% (n=40) indicated having practiced cyberbullying.

Table 6 shows the results of concordance analyses regarding victimization and aggression behavior among adolescents. When analyzing the types of behavior, the results show that for the physical type (physical victimization vs. physical aggression) 54.5% of the adolescents presented concordant answers among the different categories of response. Discordant values of physical types confirm that 33.6% of the answers showed greater involvement in victimization by the students. Among these individuals, 82% reported having been victims to some degree, but without practicing any type of bullying against another student. Regarding participation as aggressor in a more intense way (more aggressor), 11.9% of students were involved more often as perpetrators than as victims. These patterns were similar to that identified in verbal and social types. Among the discordances, in each type analyzed it is also possible to note a significant number of responses that indicated the involvement of the students only as victims. Concerning sexual and cyberbullying, there was a high percentage of concordance among the respondents, 93.4 and 85.7% respectively, with the highest number of responses in the category never happened.

The comparison of total victimization vs. total bullying revealed that 49.6% had the same participation profile across categories in both behaviors. When analyzing discordance, it is noted that 37.5% of the students showed greater participation as victims. Of these, 50.9% revealed to have been only victims, without having practiced any type aggression against another student, whereas 31.1% of the students reported that they were just bullies.

Discussion

This study explored bullying behaviors and associated factor in a population of students enrolled in public and private high schools. The results contribute locally and nationally with information on bullying victimization and aggression, allowing comparison with the findings of other Brazilian and international studies. In addition, the study investigated an unexplored topic in the Brazilian population, especially the concordance analyses between victimization and aggression.

Considering the results of the regression analysis, it was verified that the sociodemographic variables gender and school network remained associated with the adjusted final model of victimization, while the variables gender, school network, and shift remained associated with the final model of aggression. Regarding the gender variable, it was possible to observe that being a female adolescent prevented the occurrence of bullying in approximately 37 and 55%, respectively, for victimization and aggression. These findings corroborate the results or previous Brazilian investigations[3,9,22,23] showing greater involvement in aggressive behaviors by male adolescents. This might be related to their higher inability to deal with conflicts, feelings of threat, or difficulties in discerning aggression jokes that can also express socially expected behaviors that reproduce the macho social model, especially in aggressive practices.[1,4,6,22,24]

As far as school network is concerned, the results of this study revealed that the public school system is related to a lower chance of aggressive behavior. The findings show that studying in the public network prevented in about 40% the experience of being bullied, and in 50% the perpetration of maltreatment and/or bullying. Although the number of students enrolled in the private school system of this sample was lower than the number of public school students, the results are in agreement with a study carried out in Argentina, which detected more bullying in private schools (28.3%) compared to public schools (17.2%).[25] These finding contradict the common knowledge that tends to associate higher rates of school violence with socially and economically challenged communities.[6]

As for the findings associated with school shift, few studies have addressed the issue, especially in high school. Santos et al.[23] investigated this relationship in Brazilian school children aged 13 to 17 years; however, the school shift did not show statistical significance. Therefore, further studies are needed to investigate the role of shift in the occurrence of bullying, given that we detected a 35% greater chance of aggression in the morning shift in relation to the afternoon shift. In the meantime, one possible explanation for this is the greater number of students in the morning shift.

Still considering sociodemographic characteristics, the age covariate used in the victimization model indicated a 15% reduction in bullying victims with each progression in school grade. Also, the high school grade covariate used in the bullying model (aggression model) demonstrated higher levels of bullying among younger students in earlier high school grades. The formation of social groups, typical of early adolescence, seems to be a possible explanation, since this grouping can marginalize some students or even rely on violence as a form of inclusion in the groups.[4,26] Also, it may reflect the fact that as students progress in age and school grade, the frequency of aggressive behaviors tends to decrease.[4,26]

Based on the classification adopted – aggressive behavior among students -, a high percentage of bullying involvement was found in this group of adolescents, both as victims (41%) and as bullies (29.1%). This is worrisome and similar to other Brazilian studies,[6,9,19] (even some using different instruments[6,24]), and reveals the severity of the phenomenon and the potential for harm. Conversely, the fact that other studies detected lower percentages[22,27] may be reflecting the multi-causality of the phenomenon, variation in the instruments, evaluation strategies and methodologies employed, or even different family habits, and cultural, age, gender, and other peculiarities.[28,29] Such differences may generate variations in the frequency and in most common types of bullying behavior in different countries, regions, and schools.[9,28,30]

The most prevalent type of bullying was verbal (victim = 33.8%, bully = 23.1%), followed by social (victim = 21.8%, bully = 16.9%) and physical (victim = 15.1%, bully = 8.7%) bullying. Similar results have been reported by previous studies, which indicated the verbal type as the most

Table 6 Concordance between victimization and aggression, VIGIADOLEC, RMGV-ES, 2016/2017

	Never happened	Maltreatment	Frequent bullying	Very frequent bullying	Daily bullying	Concordance (%) [Same intensity]	Discordance (%) [More victim]	Discordance (%) [More aggressor]	McNemar	Overall kappa	p-value*	95%CI	Adjusted kappa
Physical aggression (n=2,281) — Physical victimization (n=2,281)													
Never happened	788 (34.5)	162 (7.1)	12 (0.6)	11 (0.5)	10 (0.4)	54.5 (n=1,244)	33.6 (n=768)	11.9 (n=269)	< 0.001	0.25	< 0.001	0.22-0.28	0.66
Maltreatment	498 (21.8)	394 (17.3)	24 (1.1)	15 (0.7)	21 (0.9)								
Frequent bullying	32 (1.4)	31 (1.4)	17 (0.7)	5 (0.2)	2 (0.1)								
Very frequent bullying	58 (2.5)	39 (1.7)	9 (0.4)	20 (0.9)	7 (0.3)								
Daily bullying	42 (1.8)	37 (1.6)	11 (0.5)	11 (0.5)	25 (1.1)								
Verbal aggression (n=2,279) — Verbal victimization (n=2,279)													
Never happened	483 (21.2)	106 (4.6)	6 (0.3)	20 (0.9)	19 (0.8)	47.8 (n=1,089)	38.2 (n=872)	14.0 (n=318)	< 0.001	0.28	< 0.001	0.25-0.30	0.54
Maltreatment	373 (16.4)	393 (17.2)	42 (1.8)	29 (1.3)	37 (1.6)								
Frequent bullying	39 (1.7)	35 (1.5)	21 (0.9)	6 (0.3)	13 (0.6)								
Very frequent bullying	51 (2.2)	94 (4.1)	28 (1.2)	29 (1.3)	40 (1.8)								
Daily bullying	94 (4.1)	82 (3.6)	27 (1.2)	49 (2.2)	163 (7.2)								
Social or psychological aggression (n=2,280) — Social or psychological victimization (n=2,280)													
Never happened	585 (25.7)	146 (6.4)	16 (0.7)	16 (0.7)	17 (0.8)	52.5 (n=1,197)	31.3 (n=713)	16.2 (n=370)	< 0.001	0.29	< 0.001	0.26-0.32	0.60
Maltreatment	362 (15.9)	509 (22.3)	41 (1.8)	41 (1.8)	49 (2.1)								
Frequent bullying	40 (1.7)	39 (1.7)	19 (0.8)	10 (0.4)	9 (0.4)								
Very frequent bullying	39 (1.7)	53 (2.3)	20 (0.9)	22 (1.0)	25 (1.1)								
Daily bullying	61 (2.7)	61 (2.7)	18 (0.8)	20 (0.9)	62 (2.7)								
Sexual aggression (n=2,278) — Sexual victimization (n=2,278)													
Never happened	2,115 (92.8)	20 (0.9)	2 (0.1)	2 (0.1)	1 (0.05)	93.5 (n=2,130)	5.1 (n=117)	1.5 (n=31)	< 0.001	0.19	< 0.001	0.12-0.26	0.95
Maltreatment	78 (3.4)	10 (0.4)	2 (0.1)	2 (0.1)	1 (0.05)								
Frequent bullying	14 (0.6)	1 (0.05)	0 (0.0)	0 (0.0)	1 (0.05)								
Very frequent bullying	14 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)								
Daily bullying	20 (0.9)	20 (0.9)	2 (0.1)	2 (0.1)	1 (0.05)								
Cyberbullying aggression (n=2,276) — Cyberbullying victimization (n=2,276)													
Never happened	1,906 (83.7)	57 (2.5)	5 (0.2)	7 (0.3)	5 (0.2)	85.7 (n=1,950)	10.5 (n=238)	3.9 (n=88)	<0.001	0.21	< 0.001	0.16-0.26	0.90
Maltreatment	186 (8.2)	36 (1.6)	2 (0.1)	7 (0.3)	1 (0.04)								
Frequent bullying	12 (0.5)	5 (0.2)	1 (0.04)	1 (0.04)	0 (0.0)								
Very frequent bullying	12 (0.5)	3 (0.1)	0 (0.0)	0 (0.0)	3 (0.1)								
Daily bullying	15 (0.7)	4 (0.2)	0 (0.0)	0 (0.0)	7 (0.3)								
Total aggression (n=2,281) — Total victimization (n=2,281)													
Never happened	264 (11.6)	59 (2.6)	8 (0.4)	11 (0.5)	14 (0.6)	49.6 (n=1,130)	37.5 (n=855)	13.0 (n=296)	< 0.001	0.31	< 0.001	0.28-0.33	0.54
Maltreatment	288 (12.6)	581 (25.5)	36 (1.6)	40 (1.7)	44 (1.9)								
Frequent bullying	24 (1.0)	52 (2.3)	25 (1.1)	14 (0.6)	9 (0.4)								
Very frequent bullying	43 (1.9)	112 (4.9)	31 (1.3)	44 (1.9)	61 (2.7)								
Daily bullying	80 (3.5)	116 (5.1)	34 (1.5)	75 (3.3)	216 (9.5)								

Data presented as n (%), unless otherwise specified.
The variables that did not amount to n=2,282 refer to the absence of valid answers for analysis.
Cells in gray indicate maltreatment and bullying behavior levels: light gray = more victim; dark gray = more aggressor.
95%CI = 95% confidence interval; RMGV-ES = Região Metropolitana da Grande Vitória – state of Espírito Santo; VIGIADOLEC = surveillance of risk factors for diseases and grievances in adolescents aged 15 to 19 years in the Greater Vitória Area.
* Pearson's chi square test.

prevalent in adolescence.[2,4,5,22,31] This type of bullying can go unnoticed by adults, who tend to seek solutions in situations of physical bullying. However, just like the physical type, verbal bullying is capable of causing serious harm to the health of those involved.[2] Among the forms of manifestation of verbal bullying, the most frequent were name-calling (victim = 24.5%, bully = 19.2%), as also found by Fischer et al.[4] Name calling using characteristics that represent the weaknesses of those involved may be used to avoid punishment.[2,4] Like us, other researchers have found a greater frequency of the social type over the physical type.[25] However, in general, verbal and physical[9,27] types are predominant over the social type in scientific studies. This may be due to the greater visibility of the physical type[2] or the non-manifestation of those involved, reducing the perception of occurrences by adults.[1]

The sexual type (victim = 2%, bully = 0.9%), although less reported, focused on sexual harassment. The result obtained is similar to the findings by Moura et al.[22] The few reports about this type of bullying may be associated with the possibility of it being expressed through words and interpreted as verbal bullying rather than sexual,[22] in addition to involving different power relations.[32] In relation to cyberbullying (victim = 2.7%, bully = 1.8%), low percentages were observed. Nevertheless, this type of bullying spreads quickly, which can increase the victims' suffering.[17]

A similar percentage of maltreatment reports was observed (43.3% among the victims and 40.4% among the perpetrators). However, physical maltreatment was more frequent than social maltreatment, a situation that is contrary to that of bullying. This can be explained by the difficulty in assuming the frequency of physical involvement in the behavior, either because it is an act of violence or because of the embarrassment in reporting the physical episode. Also, students often interpret the involvement as play,[4,13] which may not be perceived as aggression.

When the victimization and bullying behaviors were compared, it was possible to confirm expressive concordance in the simultaneous involvement as victim and bully, which may show absence of an absolute dividing line between these behaviors. This could also express a defense mechanism.[22] However, in the present study, concordant values include individuals who stated they were not involved in any of the behaviors. In the comparisons between victimization and aggression behaviors, the number of students who claim to be only victims, without involvement as perpetrators, stands out. Such situation is recurring in all comparisons. This may be related to the victims' tendency of not reacting to the aggressions suffered and to the negative feelings generated by victimization.[1,4] Another feasible explanation may be that the victims do not perceive themselves as bullies, and they can express their feelings of rejection through aggressive behavior without even realizing it.[9]

Different authors have concretely demonstrated the potential harm of bullying to the health of those involved, ranging from simple health problems to serious socialization difficulties, including the risk of psychological and physical damage (self-mutilation and suicide). These consequences can be carried on to adulthood in several manners.[33,34] The occurrence of bullying in schools is a worldwide phenomenon that affects public and private schools. School communities should urgently adopt effective prevention measures in order to promote a culture of non-violence, making the school environment a place of protection and integration.[1,13,23]

Some limitations still have to be considered. Data were collected through self-report at a single time point, which can produce socially expected responses and differences in interpretation. Age groups can influence judgment and ways of self-perception, repeating patterns generated by the trivialization of violence. Despite the limitations related to the instrument itself, concerning the proposed measurement period, this instrument was quite effective according to the pilot study.

In summary, the adolescents identified as victims did not generally attack other students, i.e., did not identify themselves as perpetrators. The high prevalence of maltreatment and bullying among adolescents, as well as the different types of manifestation and factors associated with aggressive behaviors in the present study, are worrisome, giving visibility to the phenomenon outside the American and European contexts. The study brings to light the risks students are exposed to within school settings, a primarily protective space that should not replicate social violence. For that, systematic interventions are necessary, to promote health and prevent violence.

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