



ORIGINAL ARTICLE

Association between adolescents who are victims of bullying and weapon possession



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Abstract

Objective: To verify the association between victims of bullying and weapon possession among school adolescents.

Methods: This cross-sectional study was carried out with 2,296 high school students aged 14–19 years. An instrument containing questions from the validated Youth Risk Behavior Survey questionnaire and the National School Health Survey was used. To describe the profile of interviewees, absolute and relative frequencies were calculated, and the chi-square test was applied to verify the existence of associations. To test the association of bullying with weapon possession, Poisson logistic regression (univariate and multivariate) was used. The significance level used for all analyses was 5%.

Results: Among adolescents interviewed, 23.1% reported being victims of bullying. Among victims of bullying, 37.6% (PR = 1.68; 95% CI = 1.30 – 2.17) reported having already carried some type of weapon (knife, revolver, or truncheon) in the last 30 days, while the reported firearm possession was 38% (PR = 1.67; 95% CI = 1.16 – 2.40) and 47.5% of these adolescents carried some type of weapon (knife, revolver or truncheon) in the school environment (PR = 2.10; 95% CI = 1.50 – 2.93).

Conclusions: It could be observed that adolescents who are victims of bullying are twice as likely of carrying some type of weapon (knife, revolver, or truncheon) to the school environment, and are also more likely of carrying a firearm.

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Introduction

Bullying is understood as repeated acts of violence between peers, where there is an unequal power relationship, not being intimate partners or siblings. These aggressions can be physical, verbal, or virtual.¹ This practice occurs mainly in the school environment, and the National School Health Survey (PeNSE) carried out with Brazilian students in 2015 showed a victimization prevalence of 7.4%;² however, recent studies point to a prevalence of approximately 23%,³ which may reflect an increase in this type of violence in Brazil. Internationally, a similar scenario is verified.⁴

Victimization has been widely studied, being associated with the female sex, low self-esteem, and use of tranquilizers, and also due to its association with risky behaviors such as suicidal ideation, image disorders, school absenteeism, substance misuse, feeling insecure at school, injuries, and weapon possession.⁵⁻⁸

In Brazil, access to firearms by adolescents has some restrictions, according to Law No. 10.823/03, known as the Disarmament Statute, and through this decree, there is only provision for the use of weapons by adolescents for the practice of sport shooting, upon judicial authorization, restricted to places authorized by the army command. However, according to Art. 242 of the Statute of Children and Adolescents (ECA), it is prohibited to sell, deliver and supply weapons to children and adolescents.⁹

Adolescents are prohibited from possessing a firearm, which is the possibility of buying and registering a weapon and keeping it in his/her custody, whether in residence or place of work, as well as the possession, which gives the owner the possibility of being armed. However, in Brazil, adolescents can have indiscriminate access to firearms, many times leading to fatal outcomes, mainly through problems in restricting commercialization and monitoring.¹⁰

Bullying victimization can create a feeling of fear and a need to find some way to protect themselves. The present study aimed to verify the association between bullying victimization and weapon possession in a representative sample of adolescent students in a region of northeastern Brazil.

Methods

This is a cross-sectional study, which is part of a larger project entitled: "Care to adolescent health in public services of Olinda" in which it was intended to analyze health risk behaviors among school adolescents of both sexes aged 14–19 years enrolled in the state public network of the municipality.

The sample size was established with a margin of error of 3.0%, a reliability of 95.0%, and a frequency of 25.0% of adolescents who suffered bullying. Percentages were obtained through a pilot test. According to established parameters, a total of 881 individuals would be enough to evaluate the "Bullying" variable; however, as it is an integrated study with several variables and aiming at eventual losses, the final sample was composed of 2296 adolescent students.

Sample selection occurred by a conglomerate in two stages, randomly stratified through the Randomizer software and obeying the proportionality of students for each Political Administrative Region (RPA) since there is no division by

school criteria. The sample of students in this research came from 27 schools and 151 classes, covering adolescents enrolled from the 1st to the 3rd year of high school.

Data were collected from March to June 2018. The questionnaire was administered by two previously trained researchers (Master's students). All students present on the days of collection, who had the Free and Informed Consent Form (FICF) duly signed, were invited to respond to the instrument. The average time to complete the questionnaire was approximately 30 min.

Data were collected using an instrument containing questions from the Youth Risk Behavior Survey (YRBS) validated and adapted for Brazilian adolescents¹¹ and from the Youth Risk Behavior Survey (YRBS-2015).¹² For this study, 06 questions referring to the socioeconomic and demographic module, 02 questions referring to the bullying module, 03 questions referring to the behavior module related to violence were used, totaling 11 variables. In addition to the questions that composed the questionnaire, the school system (regular, part-time, and full-time) was added to the study as a variable to be analyzed. These instruments were previously tested on the research population.¹³

Weapon possession, the dependent variable of the study, was evaluated through the following questions: "During the last 30 days, on how many days did you carry a weapon, such as a knife, revolver, or truncheon at school?"; "During the last 30 days, on how many days did you carry a weapon, such as a knife, revolver or truncheon?" and "During the last 30 days, on how many days did you carry a firearm?", with the following response options: no day / 1 day / 2 or 3 days / 4 or 5 days / 6 or more days. Students who reported "0 days" were coded as "No" and students who reported "1 or more days" for any of the questions were coded as "Yes", being considered a case of weapon possession.

The independent variables analyzed in the study included sociodemographic variables and bullying victimization. The sociodemographic variables used were based on the following questions: what is your sex? (female/male), how old are you? (14 / 15 / 16 / 17 / 18 / 19); what is your mother's schooling? (illiterate or incomplete elementary school / complete elementary school / incomplete high school / complete high school or incomplete higher education / complete higher education / not informed); what is your religion? (Catholic / Evangelical / Spiritist / Afro-Brazilian / none / other); Does anyone in your family have a family allowance? (Yes No); who do you live with? (mother and father/mother or father and other relatives / with other relatives / only mother or father/host institution for children / another family – no relative).

Two questions were used to measure bullying victimization: "In the last 12 months, have you suffered bullying at school?" and "In the last 12 months, have you suffered cyberbullying?". Both questions were answered with "no" and "yes". If respondent answered yes to any of the questions, he/she was considered a bullying victim.

To build the database and analyze data, STATA 12.0 software for Windows, EPI INFO 7.2.2.16, and Excel 2010 were used. Absolute and relative frequencies were calculated to assess the profile of respondents. To verify the existence of an association between variables, the chi-square test was applied. The prevalence ratio (PR) of variables was calculated and to test the association between bullying and

carrying a weapon, Poisson logistic regression (multivariate model) was used, which included only variables that obtained $p \leq 0.20$ in the univariate model. The significance level used for analyses was 5%. The missing data were treated with the Listwise Deletion when these data are excluded from the analysis.

This research was submitted to and approved by the Research Ethics Committee of the University of Pernambuco under CAAE 76,609,817.1.0000.5207.

Results

A total of 2296 students participated in the research, of which more than half were aged 14–16 years and were female. Just over a third were in the 1st year of high school. Most students reported having a religion. It was observed that most students lived with both parents or with one of them. The economic profile was also evaluated through the granting of social programs, where almost half reported having a family allowance. About 2 in 10 students reported having suffered bullying. About 5 out of 100 students have already carried some type of weapon (knife, revolver, or truncheon), and approximately 2 out of 100 have already carried a firearm and have already carried some type of weapon (knife, revolver, or truncheon) (Table 1).

Association was observed between bullying and the age group from 14 to 16 years (CI: 1.13–1.54). Maternal schooling greater than or equal to 11 years was associated with bullying victimization as a protective factor (CI: 0.69–0.96). Bullying was associated with the three weapon possession variables (Table 2).

In the multivariate analysis, variables age group, maternal schooling, and weapon possession (knife, revolver, or truncheon) at school and elsewhere maintained an association with bullying (Table 3).

Discussion

Bullying is a type of violence currently widely discussed worldwide.^{14–17} Individuals who suffer such aggressions can present depression, anxiety, low self-esteem, social isolation, injuries, substance misuse, and school absenteeism,^{5–8,14,16,17} consequences that harm mental and physical health, social life, academic performance and, when lasting, have a negative impact on their professional trajectory.

Currently, the prevalence of bullying among adolescents in Brazil varies from 7.2% to 38.9%,^{14,16,18,19} and internationally, it varies from 27.1% to 41.7%.⁴ The present study corroborates the aforementioned findings, being within the range of prevalence variation. However, the discrepancy in values among studies can be observed, which can be explained by the selected sample, the age group collected, and the questionnaire used, in addition to the interpretation given by the interviewee regarding the fact of suffering bullying, for example, the 2019 PeNSE questionnaire, which changed the question about bullying, increasing the prevalence compared to the results of previous versions.³

It was observed that adolescents aged 14–16 years are more prone to victimization when compared to older adolescents, corroborating previous studies.^{14,16} Younger

Table 1 Profile distribution of students enrolled in the municipal public school system of Olinda, Pernambuco, Brazil, 2018.

Variables	N	%
Age		
14–16	1225	53.4
17–19	1071	46.6
Sex		
Female	1297	56.5
Male	999	43.5
Grade		
1st year	857	37.3
2nd year	666	29.0
3rd year	773	33.7
Religion		
Yes	1571	69.1
No	703	30.9
Who lives with		
Father and/or mother	1986	86.5
Without parents	310	13.5
Maternal schooling		
< 11 years	1032	55.2
11 or more years	838	44.8
Family allowance		
Yes	1009	45.3
No	1220	54.7
School regime		
Regular	1372	59.7
Full-time	592	25.8
Part-time	332	14.5
Bullying		
Yes	530	23.1
No	1766	76.9
Carried weapon (knife, revolver or truncheon) (30 days)		
Yes	109	4.7
No	2187	95.3
Carried a revolver (30 days)		
Yes	50	2.2
No	2246	97.8
Carried weapon (knife, revolver or truncheon) at SCHOOL (30 days)		
Yes	40	1.7
No	2256	98.3

adolescents are always considered as a group vulnerable to victimization, which can be explained by their transition from adolescence to adulthood, as older individuals already have a more solid social construction process, which does not allow them to be exposed to episodes of violence perpetrated by peers.^{20,21}

Studies have indicated greater victimization by males,^{14,16,18,19,22} while others indicate that females are more vulnerable to bullying.^{15,23} In the present study, gender did not present a statistically significant difference, corroborating Lemstra (2011)²⁴ and Piggott (2018).²⁵ A study carried out in Brazil¹⁹ points out that although boys are

Table 2 Association between victims of traditional and virtual bullying and the variables analyzed in students enrolled in the municipal public school system of Olinda, Pernambuco, Brazil, 2018.

Variables	Bullying		PR	95% CI PR	p-value ^a
	Yes n (%)	No n (%)			
Age					
14–16	319 (26.0)	906 (74.0)	1.32	1.13–1.54	< 0.001
17–19	211 (19.7)	860 (80.3)	1.00	–	
Sex					
Female	295 (22.7)	1002 (77.3)	1.00	–	0.661
Male	235 (23.5)	764 (76.5)	1.03	0.89–1.20	
Grade					
1st year	227 (26.5)	630 (73.5)	1.00	–	0.004
2nd year	152 (22.8)	514 (77.2)	0.86	0.72–1.03	
3rd year	151 (19.5)	622 (80.5)	0.74	0.62–0.88	
Religion					
Yes	361 (23.0)	1210 (77.0)	1.00	–	0.685
No	167 (23.8)	536 (76.2)	1.03	0.88–1.21	
Who lives with					
Father and/or mother	448 (22.6)	1538 (77.4)	1.00	–	0.130
Without parents	82 (26.5)	228 (73.5)	1.17	0.96–1.44	
Maternal schooling					
< 11 years	263 (25.5)	769 (74.5)	1.00	–	0.016
11 or more years	174 (20.8)	664 (79.2)	0.81	0.69–0.96	
Family allowance					
Yes	232 (23.0)	777 (77.0)	1.01	0.86–1.17	0.981
No	280 (23.0)	940 (77.0)	1.00	–	
School regime					
Regular	304 (22.2)	1068 (77.8)	0.88	0.74–1.04	0.347
Full-time	149 (25.2)	443 (74.8)	1.00	–	
Part-time	77 (23.2)	255 (76.8)	0.92	0.72–1.17	
Bullying					
Yes	41 (37.6)	68 (62.4)	1.68	1.30–2.17	< 0.001
No	489 (22.4)	1698 (77.6)	1.00	–	
Carried weapon (knife, revolver or truncheon) (30 days)					
Yes	19 (38.0)	31 (62.0)	1.67	1.16–2.40	0.011
No	511 (22.8)	1735 (77.2)	1.00	–	
Carried weapon (knife, revolver or truncheon) at SCHOOL (30 days)					
Yes	19 (47.5)	21 (52.5)	2.10	1.50–2.93	< 0.001
No	511 (22.7)	1745 (77.3)	1.00	–	

^a Chi-square test.

twice as likely of suffering bullying when analyzing the frequency of aggression, higher percentages can be observed in females (45.8%). A North American study²⁶ analyzed bullying associated with other risk variables, and it was observed that females showed percentages similar to males, which denotes the breadth and complexity of the problem, pointing to a reality where both boys and girls are exposed.

It is important to highlight that low maternal schooling was associated with an increase in the number of adolescents who are victims of bullying, a result similar to that found by Malta et al. (2014)¹⁴ and Silva et al. (2018),²² but different from result obtained by Rech et al. (2013).¹⁸ It is understood that maternal schooling can be associated with social inequality, where mothers with higher schooling can

usually help their children more coherently in terms of conflict resolution, avoiding situations of violence. In addition, more educated parents may feel more comfortable being part of their children's school life, interacting better with teachers and school administrators.²⁷

When analyzing the association between bullying with weapon possession, it was observed that adolescents who were victims of bullying were twice more likely of carrying weapons inside the school environment when compared to those who did not suffer such aggression, a higher prevalence when analyzing the association between bullying and carrying weapons outside the school environment. Other studies have also observed such association,^{15,28,29} showing an up to 5 times greater chance of victimized adolescents

Table 3 Poisson logistic regression model based on variables associated with bullying in students enrolled in the municipal public school system of Olinda, Pernambuco, Brazil, 2018.

Variáveis ^a	PR	95% CI PR	p-value
Age			
14–16	1.37	1.16–1.62	< 0.001
17–19	1.00	–	
Maternal schooling			
< 11 years	1.00	–	0.010
11 or more years	0.80	0.68–0.95	
Carried weapon (knife, revolver or truncheon) (30 days)			
Yes	1.42	1.02–1.98	0.036
No	1.00	–	
Carried weapon (knife, revolver or truncheon) at SCHOOL (30 days)			
Yes	2.02	1.33–3.07	0.001
No	1.00	–	

^a Variables that were included in the model: age, school grade, who lives with, maternal schooling, carried weapon (knife, revolver or truncheon) (30 days), carried revolver (30 days) and carried a weapon (knife, revolver or truncheon) at SCHOOL (30 days).

having access to guns,¹⁵ pointing to the need for public and private investments in the prevention of bullying among young people. These studies did not investigate the reasons that lead adolescents to carry weapons, requiring work that will help in the understanding of this issue.

Previous studies have indicated that schoolchildren have a weapon possession prevalence of about 4%,^{15,26} where males are 3 times more likely of carrying weapons than the opposite sex,¹⁰ which can be justified by the fact that most of them present aggressive behaviors, endorsed by male chauvinism culture that values the use of violence by men. Older teenagers are more likely to carry weapons than younger,⁶ on the opposite, bullying victimization is more referred to in younger teenagers, therefore, it is possible to infer that if nothing will be done to break this violence in this younger age group, this may fuel a feeling of fear, of revenge that may later result in tragedy.

A survey published in July 2020 by the United Nations Regional Center for Peace, Disarmament, and Development in Latin America and the Caribbean (Unlirec) presented data containing the monitoring of cases reported by the media regarding the exclusive use of firearms in schools of Latin American and Caribbean countries between 2010 and 2019, pointing out that the use of firearms by young people within the school environment is increasingly frequent, with bullying being associated with 10% of cases.³⁰ In Brazil alone, at least three shootings with international repercussions such

as Realengo (RJ), in April 2011; Goiânia, in October 2017; Suzano (SP), in March 2019, were identified.

Such findings denote the seriousness of the problem, as well as the need for investments in policies to minimize conflicts within the school environment. In Brazil, Law No. 13.227 was signed on April 29, 2016, which institutes the National Week for Awareness, Prevention, and Combat of Systematic Bullying in public and private elementary and high schools throughout the national territory and establishing other measures to raise awareness and prevent cases of bullying among young people.

Despite laws that prohibit both bullying and the possession of weapons among adolescents, it could be observed that this does not preclude the occurrence of both and may lead, when associated, to harm to the health of these young people. In this way, the support from family and school as a protection network for victimized adolescents is of utmost importance, as well as public policies that work together with the education network and parents to strengthen socialization spaces for these young people to reduce episodes of violence.

This research contributed to ratifying the results of other studies on the topic, reinforcing that victims of bullying were two times more likely to mention carrying weapons at school during the last 30 days before the survey. School-based enforcement actions associated with non-violence programs for the academic community may be the subject of interventions for school-based research, given that the present study demonstrated that carrying a weapon at school is more frequent than carrying a weapon in general in the victims of bullying.

Regarding the limitation regarding weapon possession, it must be taken into account that this research was not able to analyze the motivation for carrying weapons among students, leading to a subjective interpretation of the real motivation, and it is possible that some individuals did not feel comfortable to report carrying weapons. In addition, the report of bullying may lead to mistaken interpretations, as bullying can be confused with jokes and be trivialized among these young people, while other young people may understand that the acts they suffer are bullying and mistakenly classify them.

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Conflicts of interest

The authors declare no conflicts of interest.

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