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The practice of bullying among Brazilian schoolchildren and associated factors, National School Health Survey 2015

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Abstract *This study explored associations between bullying and sociodemographic, mental health and risk behavior variables in school age children. This cross-sectional survey analyzed data from the National School Health Survey (PeNSE 2015). A multiple logistic regression analysis checked for factors associated with bullying. Nineteen point eight percent (95%CI 10.5 - 20.0) of the students claimed they practiced bullying. The practice of bullying was more common among students enrolled in private schools, those living with their parents, and those whose mothers have more years of schooling and are gainfully employed (28.1% CI 27.3-28.8). In terms of mental health characteristics, bullying was more common among those feeling alone, suffering from insomnia and with no friends. Looking at family characteristics, those reporting they are physically punished by family members (33.09% CI 33.1-34.6) and miss school without telling their family (28.4% 95% CI 27.9-29.0) are more likely to practice bullying. Bullying was more frequent among those reporting tobacco, alcohol and drug use, and among students claiming to have had sexual relations. The data shows that bullying is significant and interferes in school children's health and the teaching-learning process. This must be addressed looking at youth as protagonists and in an inter-sectoral context.*

Key words *Bullying, Adolescents, Practicing bullying, Alcohol, Tobacco*

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Introduction

Over time, bullying has become a serious public health problem affecting school-age children and adolescents[1,2]. It is characterized by intentional and repetitive aggressive behaviors in relationships where there is an imbalance of power[3]. It includes physical (hitting, or kicking a colleague for example), verbal (humiliating nicknames, insults, swearing), psychological (scaring, stalking, intimidating, bribing and other behaviors) and other forms of violence[3-5].

Schoolyard bullying is highly prevalent all over the world. Recently, a major epidemiological survey of 79 countries showed that about 30% of all students report having been the victim of bullying in schools[6]. This survey also found reports that 10.7% of boys and 2.7% of girls reported four or more incidents of physical aggression in the year preceding the survey[6]. In the US, a country with a long history of bullying, the 2009 Massachusetts Youth Health Survey showed that 8.4% of a sample of 2,948 High School students were guilty of some form of aggression against their schoolmates[7]. In Europe, the prevalence of bullying in countries like Portugal and Italy is as high as 27.5% and 35% respectively[8,9].

Bullying has also been studied in Latin America, and the literature shows an increment in all forms of bullying, which is becoming more serious, reflecting social inequalities[10]. A study of 3,042 students in Nicaragua found a 50.0% prevalence of bullying, 6% of whom were the aggressors[11]. Data from the National Drug Use and Prevention Study among High School Students in Peru ('Estudio Nacional de Prevención y Consumo de Drogas en Estudiantes de Secundaria de Perú'), shows a self-reported prevalence of aggression in 37.5% of a sample of 65,041 students[12].

In Brazil, the first two PeNSEs (National School Health Survey) found increasing rates of involvement in bullying among the students; 5.4% of students in state capitals reported having been bullied in 2009, and 7.2% in 2012[13-16].

The increasing prevalence of this type of violence in schools on this continent shows it is becoming more systematic and accepted as the norm in social relationships and conflict resolution between children and adoelscents[17]. Furthermore, there are gaps in the literature, in particular in terms of the role played by students identified as aggressors in bullying situations, as most studies focus on the victims and the experience they report[18,19].

This approach, looking at the role of the aggressors, is important as it realizes that they too suffer the consequences of the phenomenon, and help maintain it in the school environment. These students also have learning problems and may have early sexual encounters, use alcohol or other drugs, be part of gangs or other movements detrimental to the school and its members. They may also be delinquent and, as adults, become criminals or be involved in domestic violence[18-21].

In general, studies show that anti-social behavior and the use of alcohol and other drugs are associated with bullying[22,23]. Furthermore, the aggressors may have emotional issues, difficulty relating to colleagues and problems adapting to the school environment[18].

These justify analyses of the role of the aggressor in the dynamics of bullying, and the variables that interfere in the teaching-learning process and the health of these school children, or are related to their aggressive behavior. The focus of this study is to check the association between bullying and sociodemographic and mental health variables, and behaviors that present a health risk, within the context of the third PeNSE (2015)[24].

Methodology

This study analyzed the data from the 2015 PeNSE, the cross-sectional survey of children regularly enrolled and attending the 9th grade in public and private schools in Brazil, performed by the IBGE (Brazilian Institute for Geography and Statistics) and the Ministry of Health. The sample of 9th grade students is representative of the capitals of all 27 states and the Federal District[24].

In 2015, 124,227 students enrolled in 3,160 schools participated in the survey. Data was collected from 3,040 schools and 4,159 classrooms frequented by 120,122 students. In all, 102,301 students answered the survey on the day the data was collected. Based on the number of regular attendees the sample loss was around 8.5%[24].

Selection was a three-stage process. In the first we chose the cities or groups of cities (Primary Sampling Unit - PSU), in the second the schools (Secondary Sampling Unit - SSU), and in the third the classroom (Tertiary Sampling Unit - TSU). All of the students in the classrooms drawn and present on the day of data collection were invited to participate in the survey[24].

We considered the conceptual model of bullying, which takes into account demographic

factors, those related to mental health (isolation, insomnia, no friends), family situation (living with parents, family supervision, family violence, school absenteeism), high-risk behaviors (use of psychoactive substances) and sexually activity. Some of these factors protect, and others increase the chance of bullying[18].

We also investigated the outcome of bullying by asking the following question: (IN THE PAST 30 DAYS did you make fun of, hurt or intimidate any of your school colleagues to the extent that he or she was upset, offended or humiliated?). YES or NO.

We tested associations with the following variables:

I) In sociodemographics, we analyzed the following independent variables: a) gender (split into male or female); b) age (split into ≤ 13, 13, 14, 15, and 16 or over); c) color of skin (split into white, black, brown, yellow and native Indian), type of school (public or private), mother's years of schooling (none, primary (complete/incomplete), secondary (complete/incomplete), university (complete/incomplete) currently working (yes, no), and gainfully employed (yes/no)

II) In family situation, we looked at: a) living with mother and/or father - split into yes (students living with the father and mother, mother only or father only) and no (not living with father or mother); b) Family supervision, split into yes (parents or guardians really know what the adolescent is doing most of the time) or no (never, rarely, sometimes [know what they are doing]); c) absent from school without authorization, split into no (never) or yes (once or twice, or three or more times in the past 30 days).

III) The mental health module looked at the following independent variables: a) feeling alone - no (never or sometimes in the past 12 months), yes (most of the time, always in the past 12 months); b) insomnia - no (never or sometimes in the past 12 months), yes (most of the time, always in the past 12 months); c) friends - no (none) or yes: (1, 2, 3 or more friends).

High-risk behaviors - use of tobacco - regular or in the past 30 days (yes, no), regular use of alcohol in the past 30 days (yes, no), has experimented with drugs at some point (yes, no). Has had sexual intercourse (yes, no).

Initially, we calculated the prevalence of bullying according to sociodemographic, family situation, family violence, mental health, high risk behavior and sexual behavior variables. We later used a bivariate analysis to calculate the non-adjusted Odds Ratios (ORs) using simple logistics regression with a level of significance of 0.05. We finally ran multivariate logistic regression analyses for the outcome in question, inserting the independent variables that demonstrated an association with the outcome, calculating adjusted ORs (ORa) with a 95% confidence interval (95%CI). All analyses considered the sample structure and weights to calculate population estimates. The data was analyzed with the help of SPSS version 20 and complex sample outlining, using the complex sampling module (CSAMPLE – complex samples).

The survey was explained to the students, who were also told that they were free do decide if they wanted to participate, and that they could withdraw at any time if they felt uncomfortable answering the questions. Students who agreed answered an individual questionnaire on their smartphones, supervised by IBGE researchers. PeNSE complies with the Guidelines and Standards that Regulate Studies with Human Beings, and was approved by the Brazilian National Research Ethics Committee (CONEP/MS), CAAE (Certificate of Submission for Ethical Analysis).

Results

Bullying was self-reported by 19.8% (95% CI 19.5 - 20.0) of the students (Table 1), more frequently by boys 24.2% (95% CI 23.7-24.8), children aged 14, 15 or 16, black 21.5% (95% CI 20.0-23.1) and yellow 21.0% (95% CI 19.3-23.0). The practice of bullying was more common among students enrolled in private schools, who live with their parents, whose mothers have more years of schooling and are gainfully employed (28.1% 95%CI 27.3-28.8). In terms of mental health characteristics, bullying was more common among those feeling alone, suffering from insomnia and with no friends. In terms of family statistics, children and adolescents are more likely to self-report bullying behavior if they suffer physical punishment in the hands of a family member (33.98% 95%CI 33.1-34.6), and miss school without telling their family (28.4% 95%CI 27.9-29.0). Those reporting family supervision are less likely to bully (15.6 95%CI 15.3 - 15.9). Among those reporting high-risk behavior, bullying was more frequent among those reporting tobacco, alcohol and drug use, and among students claiming to have had sexual relations.

We calculated the gross OR (Table 2) and, following a multivariate analysis adjusted for all model variables, the following remained associated with protection from bullying: older

children - 15 (ORa = 0.88 95%CI 0.82 – 0.94), 16 (ORa = 0.79 95%CI 0.73 – 0.86), being female (ORa = 0.55 95%CI 0.53 – 0.57), those whose mothers have fewer years of schooling: no schooling (ORa = 0.86 95%CI 0.79 – 0.93), primary school (complete/incomplete) (ORa = 0.93 95%CI 0.88 – 0.96), secondary school (complete/incomplete) (ORa = 0.93 95%CI 0.89 – 0.98) and parental supervision (ORa = 0.64 95%CI 0.61 – 0.66). The following variables are associated and increase the chance that students will practice bullying: enrolled in private school (ORa 1.25; 95%CI:1.18-1.32), currently working (ORa 1.24 95%CI 1.18-1.31), those who report they are lonely (ORa 1.12 95%CI 1.06-1.18), suffer from insomnia (ORa 1.14 95%CI 1.07-1.21), suffer family violence (ORa 1.81 95%CI 1.72-1.90) and skip school (ORa 1.37 95%CI 1.31-1.43). Among high-risk behavior, those who regularly use tobacco (ORa 1.28 CI95% 1.18-1.38), regularly use alcohol (ORa 1.72 CI95% 1.65-1.80), have experimented with drugs (ORa 1.47 CI95% 1.38-1.57), or have had sexual intercourse (ORa 1.27 CI95% 1.21-1.33) are more prone to practice bullying.

Discussion

The goal of this study was to analyze the factors associated with bullying in Brazil. Results show that about one-fifth of all school children practice bullying. Bullies tend to be male, enrolled in private school and the children of mothers with more years of schooling. They reported more unhealthy behaviors (tobacco, alcohol and drug use and early sexual activity) and mental health issues (insomnia and loneliness), and missed more school, with a statistically significant difference compared to non-bullies. Those who bully also suffer significantly more physical violence in the home than those who do not. Family supervision protects against bullying.

The higher prevalence of male bullies has also been found in other domestic and international studies[19,25-28]. A possible explanation is that, regardless of the socio-cultural differences between countries or even regions within the same countries, boys are more aggressive when interacting with their peers than are girls[29,30]. The lower prevalence of bullying among older students also agrees with the literature. A recent meta-analysis shows that younger students are more likely to be involved in bullying[31]. Other studies also show that instances of aggression decrease with age after peaking at age 11 - 12[19,32].

As all participants in this study were in the same grade; the results show that older students do not use their greater physical development to intimidate younger colleagues. This may be because they have a better understanding of the harmful nature of bullying, because any aggression they practice may be interpreted by their teachers as more severe, thus subject to greater punishments, or because their colleagues may see it as cowardice as they are physically stronger[26,33].

Bullying is more prevalent among students enrolled in private schools. These results show that this phenomenon goes beyond socioeconomic differences, as shown in the 2012 PeNSE[18]. Another Brazilian study also found that bullying is more prevalent in private schools, although in that study there was no statistically significant difference[34].

Results in terms of mother's years of schooling show that the more education the mother has, the larger the chances that the child will be a bully. This is surprising, as one would expect that more educated mothers would be more aware of how to educate their children, impose suitable limits, supervise their children and help them through their needs or problems interacting with colleagues[35]. Aggressors tend to suffer more domestic violence, which is expected and confirmed by other Brazilian and international studies[18,36,37]. However, these parental practices are incompatible with what one would expect of mothers with more years of schooling. On the other hand, parental supervision seems to protect children from bullying, as has been reported in the literature[14].

More punitive disciplinary measures predispose students to becoming bullies[38], having learned how to use aggression as a means of conflict resolution from their families. This pattern of behavior is expressed in interpersonal relationships in the school[35]. This is concerning, as studies show that behavioral problems of aggressors can worsen over time, and even lead to conflicts with the law[19,39]. Beyond behavioral problems in general, bullies also tend to perform poorly in school, dislike school and have attendance problems[18]. This study confirmed bullies miss more school, which in turn could mean they have more negative feelings regarding school of have other school-related problems.

The literature shows that family or school problems, such as those displayed by students who bully, predispose them to want to work, the same happening with students who already display behavioral problems and violence[40]. This could be linked to socioeconomic issues, creating

Table 1. Prevalence of bullying among 9th grade students and Gross OR according to sociodemographic factors, and family situation, mental health and risk behavior variables. Brazil (2015).

Variable	Practice Bullying						
	%	CI 95%		OR	CI 95%		p
		Lower	Upper		Lower	Upper	
Total	19.8	19.5	20.0				
Age							
< 13	16.3	13.0	20.3	0.87	0.66	1.13	0.292
13	18.4	17.5	19.3	1.0			
14	19.3	18.5	20.1	1.06	1.02	1.11	**0.007**
15	21.2	20.3	22.2	1.20	1.14	1.26	< **0.001**
16 or over	21.9	21.1	22.7	1.25	1.18	1.32	< **0.001**
Gender							
Male	24.2	23.7	24.8	1.74	1.68	1.79	< **0.001**
Female	15.6	15.3	15.9	1.00			
Race							
White (Caucasian)	19.5	18.2	21.0	1.00			
Black	21.5	20.0	23.1	1.13	1.08	1.19	< **0.001**
Yellow	21.0	19.3	23.0	1.10	1.02	1.19	**0.018**
Brown	19.3	17.9	20.7	0.98	0.95	1.02	0.349
Native Indian	20.5	19.1	21.9	1.06	0.97	1.16	0.194
School							
Public	19.5	18.9	20.2	1.00			
Private	21.2	20.6	21.9	1.11	1.07	1.16	< **0.001**
Mother's education							
None	19.5	18.3	20.7	0.90	0.83	0.97	**0.004**
Primary (complete/incomplete)	19.5	18.8	20.2	0.90	0.86	0.94	< **0.001**
Secondary (complete/incomplete)	19.5	18.8	20.3	0.90	0.86	0.94	< **0.001**
University (complete/incomplete)	21.2	20.7	21.8	1.00			
Live with one or both parents							
No	20.8	19.8	21.9	1.00			
Yes	19.7	19.5	20.0	0.94	0.88	1.00	**0.044**
Currently works							
No	18.5	17.9	19.1	1.00			
Yes	28.1	27.3	28.8	1.72	1.65	1.79	< **0.001**
Gainfully employed							
No	18.7	18.0	19.3	1.00			
Yes	27.9	27.1	28.7	1.69	1.62	1.76	< **0.001**
Feels lonely							
No	19.0	18.4	19.6	1.00			
Yes	23.6	23.0	24.3	1.32	1.27	1.37	< **0.001**
Insomnia							
No	19.0	18.4	19.8	1.00			
Yes	25.5	24.7	26.3	1.45	1.39	1.52	< **0.001**
Friends							
1 or more	19.7	18.5	20.8	1.00			
None	22.3	21.1	23.6	1.18	1.09	1.26	< **0.001**

it continues

Table 1. continuation

Variable	Practice Bullying						p
	%	CI 95%		OR	CI 95%		
		Lower	Upper		Lower	Upper	
Physically punished (family)							
No	17.4	16.8	17.9	1.00			
Yes	33.8	33.1	34.6	2.43	2.34	2.53	< **0.001**
Family supervision							
No	27.9	27.3	28.5	1.00			
Yes	15.6	15.3	15.9	0.48	0.46	0.49	< **0.001**
Skips school							
No	17.2	16.7	17.6	1.00			
Yes	28.4	27.9	29.0	1.92	1.85	1.98	< **0.001**
Regular tobacco user							
No	18.4	17.6	19.3	1.00			
Yes	42.4	41.1	43.7	3.25	3.08	3.43	< **0.001**
Regular alcohol user							
No	16.0	15.6	16.5	1.00			
Yes	31.9	31.3	32.5	2.46	2.38	2.54	< **0.001**
Dabbles in drugs							
No	17.9	17.2	18.6	1.00			
Yes	38.8	37.8	39.8	2.91	2.78	3.04	< **0.001**
Sexual relations							
No	16.3	15.8	16.7	1.00			
Yes	29.0	28.4	29.5	2.10	2.03	2.17	< **0.001**

a demand that they contribute to the household income. Work would provide more contact with adults and a higher frequency of high-risk behavior such as the use of alcohol, tobacco and drugs, which this study also found. A study in the US showed a higher probability of alcohol, tobacco and marihuana use among students involved in bullying, as both perpetrator and victim[41]. Another study, this one in Italy, found a higher risk of alcohol and tobacco use among students involved in bullying than in those who did not participate in bullying[42]. As this study found, precocious and more frequent sex in adolescence is another high-risk behavior related with aggression[43].

Loneliness is more prevalent among students who bully, possibly as they are rejected by their peers who disapprove of their aggressive behavior. In general, aggressive children and adolescents are more likely to attribute hostile intent to other people, and seek to dominate the interaction rather than hold onto the relationshi[44]. This contributes to bullies not necessarily being popular[45]. Other studies show that loneliness fosters mental health issues such as anxiety, depression and poor self-esteem[46,47]. This data, and that related to insomnia, points to the existence of psychiatric suffering that affects quality of life and the healthy psychosocial development of bullying students.

This study has limitations that must be considered, such as the fact that the PeNSE study is based entirely on self-reporting by the students, which could lead to socially expected answers and differences of interpretation of what does or does not constitute bullying. The tool used to collect data did not have any questions to distinguish between the diverse types of bullying, which may have made it harder to identify the subtler forms of this type of violence. In another direction, the data analyzed is cross-sectional and will not indicate relationships of causality or direct influence of the variables in the study. So even if we consider bullying to be a global phenomenon, the results of this study cannot be generalized to other sociocultural contexts other than Brazil.

Table 2. Risk factors associated with bullying among 9th grade students Brazil (2015).

Variable	ORa	CI 95%		p
		Lower	Upper	
Age				
< 13	0.90	0.65	1.23	0.499
13	1.00			
14	1.02	0.97	1.08	0.478
15	0.88	0.82	0.94	**< 0.001**
16 or over	0.79	0.73	0.86	**< 0.001**
Gender				
Male	1.00			
Female	0.55	0.53	0.57	**< 0.001**
School				
Public	1.00			
Private	1.25	1.18	1.32	**< 0.001**
Mother's education				
None	0.86	0.79	0.93	**< 0.001**
Primary (complete/incomplete)	0.93	0.88	0.98	**0.010**
Secondary (complete/incomplete)	0.93	0.89	0.98	**0.010**
University (complete/incomplete)	1.00			
Currently works				
No	1.00			
Yes	1.24	1.18	1.31	**< 0.001**
Feels lonely				
No	1.00			
Yes	1.12	1.06	1.18	**< 0.001**
Insomnia				
No	1.00			
Yes	1.14	1.07	1.21	**< 0.001**
Physically punished (family)				
No	1.00			
Yes	1.81	1.72	1.90	**< 0.001**
Family supervision				
No	1.00			
Yes	0.64	0.61	0.66	**< 0.001**
Skips school				
No	1.00			
Yes	1.37	1.31	1.43	**< 0.001**
Regular tobacco user				
No	1.00			
Yes	1.28	1.18	1.38	**< 0.001**
Regular alcohol user				
No	1.00			
Yes	1.72	1.65	1.80	**< 0.001**
Dabbles in drugs				
No	1.00			
Yes	1.47	1.38	1.57	**< 0.001**
Sexual relations				
No	1.00			
Yes	1.27	1.21	1.33	**< 0.001**

However, this study is relevant and pertinent to debate and reflect on bullying in schools, given that this interferes in the teaching-learning process and in the health of the school children, along with the need to address this phenomenon intersectorally.

Conclusion

The goal of the study was to analyze the factors associated with bullying among students in Brazil. The results show a 19.8% prevalence of aggressors, most of them male, enrolled in private school and the sons of women with more schooling. These findings also show that aggressors tend to engage in more high-risk behavior such as using tobacco, alcohol and drugs and early sexual activity; they also tend to have mental health problems (insomnia, loneliness), miss more school, suffer more violence at home and have less parental supervision.

Clearly, school remains an environment that produces school violence, including bullying, making school children vulnerable. The determining factors are personal, family, school, social and cultural variables.

However, it is also the consensus that this is a complex, dynamic, multifaceted and multi-cause phenomenon, with roots in macro-social and economic issues. This requires valuing youth as protagonists, encouraging social participation and reflection, involving students, educators and families, realizing they are the subjects of needs and rights, and health and education as rights for building citizenship.

We reiterate that, as social practices, healthcare and education must establish a caring dimension in terms of promoting individual and collective health through interdisciplinary and intersector practices.

Collaborations

FCM Mello helped propose and outline the study, analyze and interpret the data, draft the first version of the article and its critical review, and approved the version for publication. RR Prado helped with the statistical analyses, worked on the critical review of the document, and approved the final version for publication. DC Malta, JL Silva, WA Oliveira and MAI Silva helped conceive the study, analyze the data, critical analysis and final review of the text. All authors approved the final version.

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