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Physical violence and associated factors in participants of the National Student Health Survey (NSHS)

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Abstract *The objective of this article was to analyze the association between physical violence in students with socioeconomic factors, family context, mental health, individual risky behaviors, and unsafe environment. Study with data from the National School Health Survey (NSHS) in 2015, with 9th graders. The outcome variable was the report of involvement in a physical struggle and the associated exposure variables used were related to socioeconomic and demographic conditions, family supervision and support, mental health, risky behaviors, and unsafe environment. Multivariate logistic regression with a hierarchical approach was used in the analyzes. The prevalence of involvement in a fight was higher in boys (30.2%; CI 29.3-31.0) than in girls (16.7%; CI 16.0-17.4). In both genders, there was a greater chance of involvement with physical violence when using drugs, missing classes, sedentary lifestyle, insomnia, loneliness and insecurity at school or in the community and, especially, when victimized by family aggression, OR 2.59 (CI 2.31-2.90) in boys and girls OR 2.42 (CI 2.17-2.71). There was a reduction in the chance of involvement in physical violence in boys because they were working and, in girls, when they study in a private school, having their problems and concerns welcomed by their parents or their participation in school activities.*

Key words *Violence, Adolescent, Adolescent behavior, School health*

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Introduction

The search for challenges, independence, and experimentation in adolescence is frequent and violence is one of the risk behaviors most addressed by the literature and health programs in this stage of life[1].

According to the WHO, accidents and violence represent the biggest public health problem in children and adolescents in developing countries[2]. In 2009, the notification system for extra-family and community domestic violence was added to the Ministry of Health Information System for Notifiable Diseases, according to the Child and Adolescent Statute (ECA in Portuguese) and the data showed that in 2011, the age group between 15 and 19 years old was the second in which there were more calls for violence in the country[3].

The Global Burden of Disease Study[4] carried out annual assessments of diseases, sequelae, and risk factors between 1990 to 2013 in 188 countries and interpersonal violence was the fourth leading cause of death in adolescents aged 15 to 19 years old. Aggressive behavior can lead to several losses for the adolescent, his family, and community and among them, medical care costs, morbidities with permanent sequelae, learning disorders, school absenteeism, feelings of fear, and death stand out[5]. Also, acts of violence directly interfere with the quality of life of an entire society[6].

As for the prevalence of involvement in fights and physical combat, a study with 161,082 students from 35 countries in North America and Europe showed values that varied from 37% to 69% in boys and 17% to 32% in girls[7]. In Brazil, the prevalence ranges from 16.2% to 20.9%[8,9].

Studies carried out from the last three editions of the National School Health Survey (NSHS) demonstrated the growing temporal trend of situations of violence, as the prevalence rates increased from 2009 to 2015 in all the violence indicators evaluated[10]. There was growth from 6.4% to 12.8% (average variation of 1.1) of the number of absences from classes due to insecurity on the school path, the prevalence of absences due to violence in the school environment increased from 5.5 to 9, 3, (average variation of 0.7), fights over firearms ranged from 4.0 to 5.6 (average variation of 0.3) while fighting with cold weapons from 6.1 to 8.2 (variation average of 0.4) and physical aggression in the family environment from 9.5 to 16.2 (average variation of 1.1). We found different patterns of growth of violence and factors of greater vulnerability in the studies, such as studying in public institutions and being male[10].

The interaction of factors in the individual, relational, community, and social spheres can influence the development of youth violence. Some general factors are the difficulty in solving personal problems, young people who have suffered abuse or aggression, lack of parental supervision and monitoring, dating and friendship relationships, inserted in a hostile and violent community, educational opportunities, financial support, and public policies[5].

International cross-sectional[11] and longitudinal[12] studies show the association between physical violence in youth and risky behaviors and emotional state, highlighting the use of illicit drugs, alcohol, tobacco, early sexual initiation, poverty, high-crime neighborhood, delinquency of peers, low supervision and family support, parental conflict, missing classes, low school performance, hyperactivity, bullying, antisocial behavior, insomnia, depressive symptoms, suicidal ideation, and sedentary lifestyle.

Thus, this study aimed to analyze the association between the physical struggle in schoolchildren with socioeconomic, family, mental health, risky behaviors, and unsafe environments in a national context.

Method

This is a cross-sectional study that used secondary data from the 2015 National Student Health Survey (NSHS)[13].

NSHS of 2015 is a school-based study and the population analyzed was students from the 9th grade of high school. The sampling took place by clusters, in two stages: schools as primary units and classes as secondary units, selected at random. Proportionally, students from public schools (municipal, state, and federal) and private schools participated. We excluded participants who did not answer questions about gender and age, totaling 102,072 valid questionnaires[13]. Data collection was carried out in 2015, through a structured and self-administered questionnaire presented to the student, applied by IBGE technicians on smartphones[13]. The organization, planning, and resources for the development of the research came from the Brazilian Institute of Geography and Statistics (IBGE), in partnership with the Ministry of Health and support from the Ministry of Education[13].

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The dependent variable in this study was the report of involvement in a physical fight, whether as aggressor or victim, at least once in the last twelve months. The exposure variables evaluated were grouped into five blocks, with socioeconomic, demographic, and school-related conditions allocated in the distal block of the model; the variables of risk behaviors, mental health, and family supervision/support allocated in the intermediate blocks, and the characteristics of the presence of an unsafe environment, proximal to the outcome.

As for the socioeconomic block, the variables were age, gender, racial color, maternal education, having monthly housekeeping and the number of bathrooms with shower at home, having paid work or not, number of residents in the house, and type of school, whether public or private.

The variables of context and family support were living with the father and/or the mother if in the last 30 days the parents or guardians knew what the adolescent did in their free time, if they understood their problems and concerns, if there were duties or tasks and if the students ate meals with their families.

Regarding mental health, the variables were the feeling of loneliness, insomnia in the last 12 months, and the existence of close friends.

As for the behavioral aspects, we analyzed drug consumption – alcohol, tobacco, and illicit drugs – in the last 30 days, physical activity in the last seven days, and skipping classes at least once in the last 30 days without the parents' knowledge.

Regarding physical activity, we used the International Physical Activity Questionnaire (IPAQ) and we considered active the adolescent who practiced 30 minutes or more of activity per week[14].

Regarding the variables on insecurity, family aggression, community insecurity on the way home from school, and insecurity at school were evaluated in the last 30 days.

The association between exposure variables and physical violence was estimated by Pearson's $\chi 2$ test, with a significance level of $p \leq 0.05$, the magnitudes were measured by Odds Ratio with 95%CI obtained through multivariate logistic regression, having the category "never fought" as a reference.

The selection of exposure variables associated with physical violence with $p \leq 0.20$ obtained in univariate logistic regression analyzes was included in the multivariate analysis, and they were placed in blocks in the model, where each of the five blocks corresponded to a hierarchical level.

For the final model, the backward method was used and the variables associated with the outcome remained with $p \leq 0.05$.

To detect the existence of multicollinearity (perfect or approximate linear dependence between at least two explanatory variables), in each of the adjusted multivariate models, we analyzed the correlation matrix between the pairs of estimated coefficients. In these matrices, high correlations (usually greater than 0.80-0.85) indicate a possible problem of collinearity. For each estimated model, the respective matrices were analyzed, and no important signs of collinearity were detected.

We used the Stata statistical package (version 13.1) and the *svy* command suitable for data analysis obtained by a complex sampling plan.

Due to a large number of information losses on maternal education (around 25% of responses not obtained), this variable was not considered in the multivariate analysis.

NSHS was approved by the National Research Ethics Commission of the Ministry of Health (IBGE, 2016). To participate in the research, students should agree to the Informed Consent Term, located on the first page of the smartphone.

Results

In the sample, young people were predominant between 14 and 16 years old (78%), absence of a housekeeper (90.5%), with only one bathroom with shower (61.7%), from a public school (85.6%), whose mothers had completed high school (30.9%). Family aggression was present in 14.4% of the assessed population, while the aggression at school or on the way home/school was found in 9.5% and 11.4% of students. Most never used legal drugs (76% for alcohol and 93% for smoking) or illicit drugs (95.9%) and more than 79% of students were classified as sedentary. Among the evaluated students, 89.9% lived with their mothers and 43.8% reported welcoming their parents when there were problems and concerns. Also, 80.7% of adolescents ate meals with parents or guardians, and 31.8% of parents or guardians checked their homework - data not shown in the table.

The prevalence of involvement in fights, one or more times in the last 12 months (Table 1), was 23.3% (CI 22.6-23.8), higher in boys 30.2% (CI 29.3-31.0) than in girls 16.7% (CI 16.0-17.4).

In the bivariate analysis, there is a higher proportion of boys with reports of physical violence

when they lived alone, having a housekeeper and with two or more bathrooms, a mother with higher education, young people who already worked, studied in a private school, history of family aggression at home and insecurity in the surroundings and at school, drug use behaviors and missing classes, not living with the mother or father, not perceiving support and supervision from the parents and feeling alone. The results in the girls were similar, except reports of a fight when they were black or of other races, being the daughter of an illiterate mother or with incomplete elementary school, while in boys the violence was greater when mothers with higher education, studying in public school, instead of private like the boys, and not having friends (Tables 2 and 3).

There were eight models of logistic regression based on the hierarchical model. In boys, there was an adjustment for the variables age, several people living in the house, having a housekeeper, bathroom, working adolescent, and type of school (model 1); the variable resident/house was excluded (model 2); the variables related to family supervision/support were inserted in model 3, all maintained a positive association according to the bivariate analysis; insomnia, feeling of loneliness and number of close friends, related to mental health (model 4); the variable about friends was excluded (model 5); the consumption of alcohol, drugs, and tobacco was included, if classes and physical activity were missed (model 6); if he lives with his mother was excluded (model 7). The final model included the variables family aggression, insecurity at school, and on the way home/school (Table 4).

The models in the girls were adjusted for the variables age, race/skin color, number of people living in the house, bathroom, working adolescent, if paid work, and type of school (model 1); the variable living in the house was excluded (model 2); the family supervision/support variables (model 3); the variable if he lives with his mother was excluded (model 4) because it lost the strength of association; insomnia, feeling of loneliness and number of close friends were inserted in model 5, the variable about friends in model 6 was excluded; the variables alcohol consumption was inserted in model 7, drugs and smoking if classes and physical activity were missed. All variables included in the model maintain the strength of association. The final model included the variables family aggression, insecurity at school, and on the way home/school (Table 5).

In the adjusted analysis, both boys and girls increased the chance of involvement in physical violence in the last 12 months when consumption of illicit drugs, alcohol and smoking, absence from classes without parental permission, physical inactivity, insomnia, feeling of loneliness, insecurity at school, from home/school and family aggression. Also, boys were associated with the involvement of fights with studying at a private school, living in a residence with two or more bathrooms and not living with their father (Tables 4 and 5).

On the other hand, there was a reduction in the chance of involvement in a fight in boys, the fact that they were working and, in girls, the acceptance of problems and concerns by parents, parents' knowledge about their daughter's activities when in free time and the fact that they studied in a private school (Tables 4 and 5).

Discussion

The main factors associated with physical violence in 9th-grade schoolchildren found in this study constituted family aggression more than once in 30 days, understanding it as the youth's coexistence in an unsafe family environment and

Table 1. Prevalence of physical violence in Brazilian 9th graders of high school. Brazil, NSHS 2015.

Variables	All % (CI)	Boys % (CI)	Girls % (CI)
No	76.7 (76.1 - 77.3)	69.8 (68.9 - 70.6)	83.3 (82.5 -83.9)
Once	11.9 (11.4 - 12.2)	14.3 (13.7 - 14.9)	9.5 (9.0 - 10.01)
2 times	5.7 (5.4 - 6.0)	7.6 (7.1 - 8.0)	4.0 (3.6 - 4.3)
3 times	2.1 (1.9 - 2.2)	2.9 (2.7 - 3.2)	1.2 (1.0 - 1.5)
≥ 4 times	3.6 (3.3 - 3.8)	5.3 (4.9 - 5.7)	1.8 (1.6 - 2.1)

Source: National School Health Survey, 2015.

Table 2. Factors associated with physical violence according to demographic, socioeconomic and school-related variables in 9th graders adolescents, Brazil, NSHS 2015.

Variables	Boys		p-value*	Girls		p-value*
	Physical Violence			Physical Violence		
	Yes (%)	No (%)		Yes (%)	No (%)	
Age group (years old)			0.129			<0.001
11-13	28.6	71.4		13.7	86.3	
14-16	30.5	69.5		17.4	82.6	
≥17	31.4	68.6		20.8	79.2	
Skin color			0.264			<0.001
White	29.3	70.7		15.0	85.0	
Black	30.7	69.1		18.2	81.8	
Brown	30.5	69.5		17.4	82.6	
Others	31.9	68.1		18.6	81.4	
People living in the house			<0.001			0.065
Living alone	73.6	26.4		23.1	76.9	
2 people	32.8	67.2		19.1	80.9	
3 people	28.8	71.2		15.6	84.4	
≥4 people	30.3	60.7		16.8	83.2	
Housekeeper			<0.001			0.896
Yes	39.2	60.8		16.9	83.1	
No	29.2	70.8		16.7	83.3	
Bathroom/shower			<0.001			0.033
None	25.3	74.7		13.6	86.4	
1	28.0	72.0		82.8	82.8	
≥2	34.5	65.5		83.7	83.7	
Mother's education level			0.002			<0.000
Illiterate	28.4	71.6		17.6	82.4	
Inc. Elementary	29.1	70.9		17.8	82.2	
Comp. Elementary	32.7	67.3		17.1	82.9	
High school	31.5	68.5		16.9	83.1	
Higher education	33.7	66.3		13.1	86.9	
Working Adolescent			<0.001			<0.001
Yes	41.8	58.2		23.0	77.0	
No	27.7	72.3		16.1	83.9	
Paid work			<0.001			<0.001
Never worked	27.7	72.3		16.1	83.9	
Yes	41.8	58.2		23.4	77.6	
No	40.8	59.2		28.8	77.1	
Related to School			0.617			0.160
Shift						
Morning/Afternoon/Night	30.2	69.8		16.7	83.3	
Full-time	32.3	67.7		19.7	80.3	
Type			<0.001			<0.001
Public	29.3	70.7		17.5	82.5	
Private	35.5	64.5		12.1	87.9	

*P-value of the $\chi 2$ test (chi-square) between the frequencies of physical violence in the analysis categories.
Source: National School Health Survey, 2015.

those of a behavioral nature evidenced by licit and illicit drugs, physical inactivity and absence from classes.

International studies[15,16] that refer to physical struggle involving schoolchildren has shown fluctuation in terms of exposure variables, how-

Table 3. Factors associated with physical violence according to variables related to risk behaviors, mental health, family supervision/support and "safe environment", among 9th graders schoolchildren. Brazil, NSHS 2015.

Variables	Boys		p-value*	Girls		p-value*
	Physical Violence			Physical Violence		
	Yes (%)	No (%)		Yes (%)	No (%)	
Risk behaviors						
Alcohol intake in the last 30 days			<0.001			<0.001
Never	19.5	80.5		7.2	92.8	
Yes, but not drinking in 30 days	31.3	68.7		18.3	81.7	
Drank at least 1 time in 30 days	50.1	49.9		31.6	68.4	
Drug use in the last 30 days			<0.001			<0.001
Never	27.5	72.4		14.3	85.7	
Consumes but has not used within 30 days	50.9	49.1		37.7	62.3	
Used at least once in 30 days	61.7	38.3		50.8	49.2	
Smoking in the last 30 days			<0.001			<0.001
Never	26.0	74.0		12.5	87.5	
Yes, but not smoking in the last 30 days	43.7	56.3		31.8	68.2	
Smoked at least 1 time in 30 days	56.7	42.3		49.0	51.0	
Physical activity in the last 7 days			<0.001			<0.001
Sedentary	28.4	71.6		16.1	83.9	
Active	34.8	65.2		21.1	78.9	
Missed classes in the last 30 days without parental or guardian permission			<0.001			<0.001
None	26.9	73.1		13.8	86.2	
≥1 day	40.1	59.9		27.3	72.7	
Mental health						
Insomnia			<0.001			<0.001
No	26.7	73.3		11.8	88.2	
Yes	39.8	60.2		22.8	77.2	
Feeling of Loneliness			<0.001			<0.001
No	26.8	73.2		12.3	87.7	
Yes	37.6	62.4		20.3	79.7	
Number of close friends			0.954			0.004
No friends	30.1	69.9		21.5	78.5	
≥1 friend	30.2	69.8		16.5	83.5	

it continues

ever, some behaviors and profiles presented have a high frequency of association. They are: male sex, consumption of licit and illicit drugs, skipping classes, living in violent places, conflicts in the family system, little parental supervision and having depressive symptoms.

Family aggression can show a hostile environment at home, favoring the youth's learning of models of aggressive behavior developed both within the family and in society. The experience of children and adolescents in situations of violence is related to a greater propensity to have behaviors that reproduce aggressiveness in current or future relationships[17].

Both national and international studies corroborate the relationship between aggression in the intrafamily environment and violent behavior in childhood and adolescence. In Fortaleza-CE, we identified that being beaten at home increased youth involvement in interpersonal violence as an aggressor by 13%[18]. In São Gonçalo-RJ, a survey showed that students who reported severe psychological, sexual or physical violence by family members or people in signifi-

Table 3. Factors associated with physical violence according to variables related to risk behaviors, mental health, family supervision/support and "safe environment", among 9th graders schoolchildren. Brazil, NSHS 2015.

Variables	Boys		p-value*	Girls		p-value*
	Physical Violence			Physical Violence		
	Yes (%)	No (%)		Yes (%)	No (%)	
Family Supervision and Support						
Living with the mother			<0.000			<0.000
Yes	29.7	70.3		16.3	83.7	
No	35.2	64.8		20.8	79.2	
Living with the father			<0.000			<0.000
Yes	28.4	71.6		15.1	84.9	
No	33.9	66.1		19.4	80.6	
Have meals with parents or guardians			<0.000			<0.000
Yes	29.2	70.8		14.9	85.1	
No	36.0	64.0		23.1	76.9	
Problems and concerns welcomed by parents or guardians			<0.000			<0.000
Yes	28.2	71.8		13.7	86.3	
No	35.2	64.8		22.0	78.0	
Parents or guardians knew what they were doing in their free time			<0.000			<0.000
Yes	28.3	71.7		14.8	85.2	
No	37.2	62.8		25.8	74.2	
Safe Environment						
Family assault in the last 30 days			<0.001			<0.001
None	25.8	74.2		13.0	87.0	
≥Once	57.5	42.5		37.7	62.3	
Insecurity at school in the last 30 days			<0.001			<0.001
None	27.5	72.5		15.2	84.8	
≥Once	53.9	46.1		32.5	67.5	
Insecurity on the way home/school in the last 30 days			<0.001			<0.001
None	27.7	72.3		15.0	85.0	
≥1 day	49.5	50.5		30.3	69.7	
Parents or guardians checked lessons or homework			<0.000			<0.000
Yes	28.0	72.0		13.8	86.2	
No	33.5	66.5		19.9	80.1	

*P-value of the χ^2 test (chi-square) between the frequencies of physical violence in the analysis categories.

cant relationships increased the chance of being involved in violence in the community and in the school environment more than three times than in students who did not report domestic violence[19]. In Minnesota, United States (USA), the results were similar even when assessing physical or sexual abuse by a family member or not, or simply witnessing physical abuse in the family[20].

Several forms of manifestations of violence can contribute to the feeling of insecurity in schools, such as bullying, use of firearms or cold weapons, physical fighting, robberies, damage to property, drug use, and violence in the surrounding neighborhood or community that the school is inserted[10,21]. According to studies, the exposure to violence at school and in the community can compromise academic performance, school attendance, causing physical and emotional damage[22] and the feeling of insecurity is commonly seen more frequently in public schools, for reasons of location or aspects related to the school organization[10].

Table 4. Gross and adjusted Odds Ratio in the final model of physical violence according to categories of analysis in male 9th graders adolescents. Brazil, NSHS 2015.

Variables	Boys			
	Gross Analysis		Adjusted Analysis	
	Odds Ratio (CI95%)	p-value*	Odds Ratio (CI95%)	p-value*
Bathroom/shower		<0.001		<0.001
None	1.00		1.00	
1	1.14 (0.94 - 1.38)		1.23 (1.02 - 1.50)	
≥2	1.55 (1.28 - 1.87)		1.56 (1.29 - 1.90)	
Working adolescent		<0.001		<0.001
Yes	1.00		1.00	
No	0.53 (0.48 - 0.58)		0.76 (0.69 - 0.85)	
Related to School - Type		<0.001		<0.001
Public	1.00		1.00	
Private	1.32 (1.18 - 1.48)		1.52 (1.35 - 1.72)	
Living with the father		<0.001		0.004
Yes	1.00		1.00	
No	1.29 (1.20 - 1.39)		1.12 (1.04 - 1.23)	
Insomnia		<0.001		<0.001
Yes	1.80 (1.65 - 1.97)		1.27 (1.15 - 1.35)	
No	1.00		1.00	
Feeling of Loneliness		<0.001		<0.001
Yes	1.64 (1.52 - 1.76)		1.24 (1.04 - 1.38)	
No	1.00		1.00	
Alcohol intake in the last 30 days		<0.001		<0.001
Never	1.00		1.00	
Yes, but not drinking in 30 days	1.87 (1.71 - 2.06)		1.57 (1.43 - 1.72)	
Drank at least 1 time in 30 days	1.79 (1.32 - 2.44)		2.49 (2.23 - 2.78)	
Drug use in the last 30 days		<0.001		<0.001
Never	1.00		1.00	
Consumes but has not used within 30 days	2.72(2.29 - 3.23)		1.39 (1.14 - 1.70)	
Used at least once in 30 days	4.24 (3.60 - 4.98)		1.55 (1.26 - 1.90)	
Smoking in the last 30 days		<0.001		<0.001
Never	1.00		1.00	
Yes, but not smoking in the last 30 days	2.21 (1.99 - 2.45)		1.32 (1.17 - 1.49)	
Smoked at least 1 time in 30 days	3.88 (3.35 - 4.48)		1.43 (1.16 - 1.72)	
Physical activity		<0.001		<0.001
Active	1.00		1.00	
Sedentary	1.34 (1.24 - 1.46)		1.35 (1.24 - 1.48)	
Missed classes in the last 30 days without parental or guardian permission		<0.001		<0.001
None	1.00		1.00	
≥1 day	1.81 (1.65 - 1.98)		1.31 (1.18 - 1.46)	
Family aggression in last 30 days		<0.001		<0.001
None	1.00		1.00	
≥Once	3.89 (3.52 - 4.29)		2.59 (2.31 - 2.90)	
Insecurity on the way home/school in the last 30 days		<0.001		0.003
None	1.00		1.00	
≥1 day	3.08 (2.72 - 3.48)		1.24 (1.07 - 1.43)	
Insecurity at school in the last 30 days		<0.000		<0.000
None	1.00		1.00	
≥1 day	2.56 (2.31 - 2.83)		1.68 (1.41 - 2.00)	

Table 5. Gross and adjusted Odds Ratio in the final model of physical violence according to categories of analysis among 9th graders girls. Brazil, NSHS 2015.

Variables	Meninas			
	Gross Analysis	p-value*	Adjusted Analysis	p-value*
	Odds Ratio IC95%		Odds Ratio IC95%	
Type of school		<0.001		<0.001
Public	1.00		1.00	
Private	0.64 (0.57 - 0.73)		0.78 (0.69 - 0.89)	
Problems and concerns welcomed by parents or guardians		<0.001		0.015
Yes	0.56 (0.50 - 1.61)		0.89 (0.71 - 0.93)	
No	1.00		1.00	
Parents or guardians knew what they were doing at free time		<0.001		0.006
Yes	0.49 (0.44 - 0.56)		0.81 (0.71 - 0.93)	
No	1.00		1.00	
Insomnia		<0.001		<0.001
Yes	2.21 (2.02 - 2.42)		1.42 (1.27 - 1.59)	
No	1.00		1.00	
Feeling of Loneliness		<0.001		0.015
Yes	1.81 (1.64 - 2.00)		1.13 (1.01 - 1.26)	
No	1.00		1.00	
Alcohol intake in the last 30 days		<0.001		<0.001
Never	1.00		1.00	
Yes, but not drinking in 30 days	2.87 (2.55 - 3.22)		2.08 (1.83 - 2.35)	
Drank at least 1 time in 30 days	5.92 (5.27 - 6.66)		2.82 (2.44 - 3.26)	
Drug use in the last 30 days		<0.001		<0.001
Never	1.00		1.00	
Consumes but has not used within 30 days	3.61 (3.04 - 4.29)		1.38 (1.12 - 1.70)	
Used at least once in 30 days	6.16 (5.00 - 7.60)		1.70 (1.32 - 2.19)	
Smoking in the last 30 days		<0.001		<0.001
Never	1.00		1.00	
Yes, but not smoking in the last 30 days	3.27 (2.90 - 3.69)		1.62 (1.40 - 1.87)	
Smoked at least 1 time in 30 days	6.74 (5.73 - 7.93)		2.15 (1.75 - 2.65)	
Physical activity		<0.001		<0.001
Active	1.00		1.00	
Sedentary	1.39 (1.25 - 1.55)		1.33 (1.17 - 1.50)	
Missed classes in the last 30 days without parental or guardian permission		<0.001		<0.001
None	1.00		1.00	
≥1 day	2.33 (2.09 - 2.60)		1.31 (1.16 - 1.49)	
Family aggression in last 30 days		<0.001		<0.001
None	1.00		1.00	
≥Once	4.04 (3.65 - 4.47)		2.42 (2.17 - 2.71)	
Insecurity on the way home/school in the last 30 days		<0.001		<0.001
None	1.00		1.00	
≥1 day	2.46 (2.17 - 2.80)		1.48 (1.27 - 1.72)	
Insecurity at school in the last 30 days		<0.000		0.005
None	1.00		1.00	
≥1 day	2.69 (2.36 - 3.06)		1.29 (1.09 - 1.54)	

The consumption of alcohol and other drugs has a high prevalence in adolescents. Although there has been a reduction in the consumption of cigarettes at this stage of life, in recent years, there has been an increase in the consumption of alcohol and illicit drugs, which has shown an association with violent behaviors[23], as in this study.

A survey in the USA[24] showed that students who did not use marijuana and alcohol were the least involved in fights (77.3%). In Thailand, there was an increase of 200% in involvement in fights without injuries and 40% in fights with serious injuries in students who drank[25].

In Brazil, urban violence was evaluated either as an aggressor or as a victim in people between 15 and 64 years old, and the prevalence was higher in cocaine users 19.7% and in people who frequently consumed alcohol 18.1%[26].

Predictors of alcohol consumption, illicit drugs, and physical violence in youth have been investigated. However, there has been difficulty in establishing causal relationships between these behaviors, due to the complexity in defining the order of these behaviors[26,27].

The compromise of mental health with the presence of insomnia and feeling of loneliness also increased the chance of interpersonal violence, which can be indicative of anxiety disorder, depression, or a Common Mental Disorder. Research shows that adolescents with depressive symptoms, feelings of loneliness, and anxiety are more likely to be involved in aggressive behaviors either as victims or as aggressors[28-30].

A cross-sectional survey that used school-based data in Saudi Arabia investigated the relationship between physical violence in the last year and the mental health of 9,073 students through self-report research. A positive association was found between symptoms of depression and anxiety and interpersonal violence. Schoolchildren who were involved in a fight were 1.7 times more likely to have depressive symptoms, while schoolchildren who reported signs of anxiety were 1.48 times more likely to fight and 1.84 more likely to have mental health impairment when compared to students who did not mention physical struggle[30].

In Brazil, data from the 2015 National School Health Survey (NSHS) showed an association between depressive symptoms, feelings of loneliness and insomnia with the consumption of legal and illegal drugs, showing the tendency for the group of risk behaviors in adolescence[31].

In this study, the absence of a father figure at home in the boys was associated with physical violence, which may show the lack of a nuclear family model. A study in São Paulo showed a higher prevalence of actions involving crime and violence, risky sexual behavior, and consumption of drugs and alcohol in young people who do not live with either parent and, then, young people who lived with only one parent, justifying the importance of family structure for the prevention of risky behavior in young people[32].

In the girls, those who perceived receiving family support daily were less involved in a physical struggle, which is similar to other investigative works that emphasize the importance of family support as a factor that protects young people regarding risk behaviors[29,33].

A better economic condition in boys evidenced by the proxy variables studying in a private school and having two or more bathrooms at home increased the possibility of involvement in fights. In the bivariate analysis, a higher prevalence of mothers with higher education was observed in boys who reported a fight, and this context indicates that a higher social class has been controversial in studies evaluating any type of violence in young people. In a study conducted with data from NSHS 2009, there was no difference regarding involvement in fights between public and private schools[21].

Lower social class markers have been linked to violence in adolescents, as shown by Kipping et al.[34], who observed in a cohort study in the United Kingdom that the socioeconomic status analyzed through maternal school, family income, and parents' social class, the lowest social level was associated with violent behavior and several other harmful behaviors to adolescent health[34].

The private school space in general offers more security, disciplinary control, and a better structure for the learning and development of young people[35]. Although it seems contradictory, some studies have also shown a higher prevalence of risky behavior in students from private schools than in public schools, and the most observed risk behaviors were reckless driving, involvement in fights, alcohol, cigarette, and illicit drugs[36,37].

Albuhairanl et al.[30] found an association between higher maternal school level and students' reports of involvement in fights in the last year, in Saudi Arabia. The researchers report the unusual nature of these findings and suggest that it could be because the mothers with a higher level of education represent a small part of the sample (23.3%).

Dropout rates are significantly higher in public school students, especially at the end of

elementary school and in high school, and part of the students involved in fights may be out of public school, leading to a sample of this study with disproportionate loss of students in the variable physical struggle[38].

We identified the variable of the work of adolescents in this study as a protective factor for the involvement of interpersonal violence in boys, which is corroborated by another national study[39], but it has been a variable little evaluated in studies of this nature.

There was also an increase in physical violence behaviors in students who missed classes without parental permission in six countries in the Western Pacific and in students who missed classes without parental permission. They were more likely to fight, OR=1,72 (1.51-1.95) than students who did not miss classes[11]. Students who miss classes are more likely to have other health risk behaviors such as the use of alcohol and drugs, the simultaneity of health risk factors increases the chance of involvement in situations of violence[8,11].

Research on physical struggle involving schoolchildren oscillates widely in the variables associated with this outcome. However, some behaviors and profiles presented in the literature have a high frequency of association with physical violence. They are male gender, consumption of alcohol, cigarettes, and drugs, skipping classes, living in places with high levels of violence, having depressive symptoms, conflicts in the family system, and little parental supervision[11,15,30,40]. These findings are similar to the variables found in this study that were associated with physical violence.

The literature has shown that contextual and individual factors influence aggressive behavior, and interventions to contain violence must be based on scientific evidence that shows violence in young people who are also under school supervision, a space with great potential for observation and intervention, reducing conflicts. Understanding the vulnerabilities in which adolescents are inserted is essential to formulate strategies for health promotion according to their needs and experiences to provide subsidies for directing public policies, promoting the improvement of health indicators, and preventing risk behaviors at this stage.

In addition to the cross-sectional design that does not propose causal inference, a study limitation was the greater possibility of information bias, considering the age group involved, especially when answering subjective questions or who need knowledge and retention, such as the mother's education level.

NSHS only evaluates children who are enrolled and present at school but school dropout in young people is high in the country, especially those from public schools and with older age, at the end of elementary school or in high school.

Despite the limitations, this study has a good representation of adolescents in Brazil and provides contributions for understanding the factors associated with involvement in schoolchildren's fights.

Most of the studies evaluated on the involvement in physical violence in students nationwide are analysis of aspects related to the consumption of alcohol, drugs, bullying, and socioeconomic conditions, and there are still few types of research that gather factors associated with mental health, social interaction and family support and domestic violence, as in this study. The importance of NSHS for the investigation and planning of actions to prevent violent behavior in schoolchildren is highlighted, as it allows the analysis of several contextual and individual variables.

The factors related to involvement in fights in girls and boys were similar, but the conditions that reduce them in boys were working and in girls the perception of receiving support from parents and studying in a private school.

Multiple factors are associated with involvement in physical violence in adolescents, either as a victim or aggressor, showing that an unhealthy lifestyle for young people and greater social vulnerability, reinforcing the need for programs that address the complexity and coexistence of related causes.

Collaborations

JS Romeiro participated in the idealization of the article, worked on data interpretation and writing of the article. MM Corrêa worked on the analysis and interpretation of the data, carried out a critical review and approved the final version of the manuscript. R Pazó and FMC Leite collaborated in the critical review and approved the final version. NV Cade participated in the idealization of the article, contributed in the analysis and interpretation of data, in the critical review and approved the final version.

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