

A nationwide school-based study of violence in Brazil (PeNSE, 2015)

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Abstract *The study aims to describe victimization for domestic violence (DV), knife-related violence (KV), firearm-related violence (FV) and sexual violence (SV). This was a nationwide Brazilian survey with school-based interviews. All 9th grade students from public and private schools in Brazil were invited to participate. The sampling process was at random and cluster-based and performed in three stages: municipalities, schools, and classrooms. Univariate, bivariate and multivariate analyses were carried out considering the sample weights. A total of 100,540 individuals were assessed and the prevalence of victimization for DV, KV, FV and SV was 14.5%, 7.9%, 5.7% and 4.0%, respectively. The DV was more frequent in the South-eastern region, FV was more frequent in the Central-Western region and the KV and SV were more frequent in the Northern region. The victimization for DV and SV was higher among the girls, while the FV and KV were greater among the boys. All forms of victimization were more frequent among public school students, among those at age 16 or older, for those whose mothers have a lower educational level and those who have used alcohol or illegal drugs.*

Key words *Violence, Domestic Violence, Violence against Women, Exposure to Violence, Students*

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Introduction

Interpersonal violence is the intentional use of force or power, in a real or threatening way, against the person or group, which can cause death by injury, bodily or psychological harm, by physical, psychological, sexual assaults or negligence¹. Three types of violence are highlighted: the Domestic, when it occurs between relatives; Violence by Intimate Partner, when the abuser and victim are in a romantic relationship; and Armed Violence, when it involves weapons to injure or threaten another person^{1,2}.

Globally, it is estimated that between 10% to 15% children of school age are victims of some type of severe violence³. In Latin America, approximately one in three children were victims in the twelve-month period⁴. In Brazil, teenagers were one of the most victimized groups between 2009 and 2014⁵, and the profile of the victims was characterized in two large dimensions – girls suffered Domestic Violence more than boys, who were more frequent victims of Armed Violence⁶. During this period, girls were also identified as the main victims of sexual violence⁷. Also, school-based studies, using data from the National School Health Survey (PeNSE), in the 2009 and 2012 editions, shows that the most frequent type of violence suffered for both sexes was physics^{6,8}.

Once violence is a violation of the rights, as provided for in the Statute of the Child and Adolescent (*Estatuto da Criança e do Adolescente* - ECA), any violence episodes must be notified⁹. However, studies have shown a high rate of underreporting, even by institutions responsible for children protection, such as schools and health services^{10,11}. Furthermore, adults, abusers and even victims, may omit the episodes due to fear of the consequences².

Violence episodes can cause severe damage to physical and mental health. Evidence shows that adolescents victims had an approximately twofold increased risk of developing mood and anxiety disorders and substance use disorders in adult life¹². Still, the damages involve all society, since violence occurs and can be perpetuated by a complex network of personal factors and cultural values of a community¹³.

As a major public health problem, the impact of violence demands the attention of health and social services¹⁴. Thus, to contribute to future interventions, this study aims to describe the prevalence of teenagers exposed to situations of domestic, sexual and armed violence and to analyze the associated factors using PeNSE data 2015.

Methods

Study design

This study analyzed data from the National School Health Survey (*Pesquisa Nacional de Saúde do Escolar* - PeNSE) of 2015. The PeNSE is a nationwide school-based survey conducted by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* - IBGE), which monitors the Brazilian teenager population (10 to 19 years). Data collection occurred in 2015, between April and September, using a structured and self-applied questionnaire. The questionnaire followed the Global School-based Student Health Survey (GSHS) methodology, developed by the World Health Organization (WHO), which guides epidemiological research, focuses on the morbidity and mortality causes among the teenagers. In the PeNSE first year, the questionnaire pre-tests were conducted on 9th-grade students in eight schools (public and private) in the municipalities of Mesquita (Rio de Janeiro), Rio de Janeiro (Rio de Janeiro), Belém (Pará), Recife (Pernambuco) and Luziânia (Goiás). The results of the pre-tests showed good comprehension of the questionnaire, maintaining the questions in the editions of 2012 and 2015. The question about sexual violence was included in this last edition.

Sample

The sample (n=102,072) was students from 9th grader of elementary school, enrolled in 2015, in public or private schools, in urban or rural areas, in day shift, from 26 capitals of Brazil and the Federal District. The choice of this population is related to the minimum schooling required for comprehension of the questionnaire, as well as for the similarity with the age group evaluated by the GSHS survey¹⁵. PeNSE used three sample selection stages, based on the 2013 School Census. Municipalities, schools, and all 9th grade classes were the primary (PSU), secondary (SSU) and tertiary sample units (TSU), respectively. The classes were randomly selected. All students, from the selected classes, that were present on the data collection day, were invited to attend the survey. The sample size calculation, the prevalence of 50%, margin of error of 3 percentage points and confidence level of 95% were used as parameters.

Outcomes

The outcomes were victimization for Domestic Violence (DV) in the physical form; Sexual Violence (SV) and Armed Violence, including firearm-related violence (FV) and knife-related violence (KV). For the respective outcomes, it was asked: “In the past 30 days, how many times have you been physically assaulted by an adult in your family?”; “Have you ever been forced to have sexual intercourse?”; “In the last 30 days, have you been involved in any fight where someone has used a firearm, such as a revolver or a shotgun?”; “In the last 30 days, have you been involved in any fight where someone has used some other weapon such as a knife, pocketknife, stone, wood piece or bottle?”. For those who answered yes were considered victims.

Data analyses

Descriptive prevalence analyses of DV, SV, KV, and FV was according to gender (male and female), age (≤ 13 ; 14; 15; ≥ 16), self-reported race/skin color (White; Black; Yellow; Brown and Indigenous), mother’s schooling in years (0 to 1, 8 to 9 to 11, ≥ 12), school system (public or private), macro-regions of Brazil (Northern, Northeastern, Southeastern, Southern, Central-Western) and alcohol and illicit drugs consumption, such as marijuana, cocaine, crack, oxy (any frequency in the last month).

The data was analyzed in the statistical program STATA (version 13). Tables describe the absolute and relative rates. Bivariate analyses tested the association between the dependent and the independent variables using the chi-square test. All analyses were carried out using the *svy* set command, which takes into consideration sample weights. Sample weights were defined for the all above mentioned sample units. The adjusted analysis was performed using Poisson regression based on a hierarchical model composed of four levels. It was considered a theoretical comprehension model of the determination of violence, where more distal characteristics are on the first level, and more proximal aspects of the outcome are at the last level. This analysis took into account the effect of each variable in relation to the outcome and controlled for confounding among variables of the same level and higher levels. Variables that presented a p-value < 0.20 in each level were maintained in the adjusted analysis. The first level included contextual characteristics (macro-regions of Brazil and school

system [public or private]). Sociodemographic characteristics (age and race/skin color) were included in the second level. The third level included the socioeconomic characteristics (maternal schooling and cohabitation), and at the fourth level the behavioral variables (use of alcohol and illicit drugs). P-values lower than 0.05 were considered statistically significant.

Ethical aspects

This survey was guided by the Statute of the Child and Adolescent (Law No 8,069 of 13.07.1990) and was approved in the National Commission of Ethics in Research (*Conselho Nacional de Saúde* - CONEP).

Results

Data were obtained for 100,540 individuals (1.5% missing information). Table 1 shows the sample characteristics. The sample majority consisted of students from public schools (85.4%), female (51.6%), 14 years old (51.1%), who self-declared their skin color/race as brown (43.1%), who lived with both parents (59.4%) and whose mothers had less than or equal to 8 years of schooling (42.6%). Alcohol use was reported by 23.8% of the students reported, and 4.1% had used illicit drugs in the last month.

Table 2 presents the prevalence and associated factors for the entire sample. A prevalence of 14.5%, 7.9%, 5.7%, and 4.0% were observed for victimization by physical domestic violence (DV), knife-related violence (KV), firearm-related violence (FV) and sexual violence (SV), respectively. DV was more frequent in the Southeast, FV in the Central-Western, KV and SV in the North. DV and SV victimization were higher among girls, while FV and KV among boys. The SV most frequent author was the boyfriend or ex-boyfriend of the victim (data not shown in the table).

Violence in all forms was more prevalent in schoolchildren in public schools, among those 16 years old or older, children of mothers with low or no schooling, who had used alcohol or illicit substances in the last month. Victimization was higher as the age increased. DV and SV were more frequent among schoolchildren who self-reported their skin color/race as yellow, while VF and KV were more common among those of skin color/race were black. FV was more frequent among schoolchildren who only lived with their

father, and KV, DV and SV among those who lived without either parent.

Table 3 presents the gross analysis results (prevalence ratio), stratified by sex, for FV, SV, DV, and KV. Associations between demographic, socioeconomic and behavioral characteristics

were observed in all types of violence, except for the macro-region and school system for DV and macro-region for SV among boys.

Table 4 shows the stratified analysis results (prevalence ratio), stratified by sex, for DV, SV, FV, and KV. For both sexes, DV was more frequent in the Southeastern compared to the Southern and larger as the age increased. In relation to race/skin color, 30-40% higher prevalence of DV was observed among boys with skin color/race brown (PR = 1.37; 95%CI 1.10; 1.71) and between girls who self-declared their skin color/race as black (PR = 1.34; 95%CI 1.18; 1.51), brown or indigenous (PR = 1.36; 95%CI 1.14; 1.62). DV was about 40% more frequent among children of mothers with no schooling (0 years of schooling) for both sexes compared to those with higher schooling. Girls in public schools reported a higher occurrence of DV compared to private schools, an association not observed among boys. Boys who did not live with either parent had a higher frequency of DV while girls who lived only with their mother or only with their father reported a higher DV occurrence compared to those living with both parents. Schoolchildren who consumed alcohol in the last month reported twice as many DV occurrences compared to those who did not report use. DV was more frequent in those who reported illicit drug use in the last month, both in boys (PR = 1.40; 95%CI 1.21; 1.62) and girls (PR = 1.61; 95%CI 35; 1.92).

The SV report among girls was less frequent in the Southeastern (PR = 0.76; 95%CI 0.61; 0.95) and Northeastern (PR = 0.79; 95%CI 0.66; 0.96) in South. There was no significant difference for SV according to the region among the boys. SV in schoolchildren was about twice as high among boys and 2.5 times higher among girls in public schools compared to private schools. In both sexes, higher SV victimization was observed as the respondent's age increased. Girls of skin color/race black and brown reported about 40% and 70% more SV compared to girls of skin color/race white, with no association of skin color/race with SV among boys. The higher level of maternal schooling was a protective factor for SV among boys, but not among girls. Girls who lived only with mothers reported the lowest frequencies of SV, a difference not observed among boys. SV was higher among schoolchildren who reported using alcohol and illicit drugs, being higher among boys than girls.

FV was higher in the Central-Western in both sexes compared to the Southern and about twice as high in public school students compared to

Table 1. Sample description, according to demographic, socioeconomic, behavioral characteristics (PeNSE, 2015; N = 100,540).

Variables	Sample description N (%)
Region	
Southeast	17,539 (43.4)
North	23,568 (9.6)
Northeast	35,798 (27.7)
South	9,689 (11.8)
Central-Western	13,946 (7.5)
School system	
Public	79,752 (85.4)
Private	20,788 (14.6)
Gender	
Male	48,321 (48.4)
Female	52,219 (51.6)
Age	
≤13	17,079 (18.4)
14	50,963 (51.1)
15	20,456 (19.6)
≥16	12,042 (10.9)
Skin color/race	
White	33,338 (36.2)
Black	12,610 (13.3)
Brown	46,238 (43.1)
Yellow	4,505 (4.1)
Indigene	3,755 (3.3)
Maternal schooling (years)	
0	5,405 (7.3)
1 to 8	23,869 (35.3)
9 to 11	23,910 (32.9)
≥12	22,477 (24.4)
Cohabitation	
Neither parent	6,490 (5.7)
Only with mother	31,266 (30.6)
Only with father	4,832 (4.4)
Both parents	57,843 (59.4)
Alcohol consumption (month)	
No	78,235 (76.2)
Yes	22,241 (23.8)
Illicit drugs use (month)	
No	96,687 (95.9)
Yes	3,829 (4.1)

Table 2. Domestic Violence (DV), Sexual Violence (SV), Firearm-related Violence (FV) and Knife-related Violence (KV) prevalence, according to demographic, socioeconomic and behavioral characteristics (PeNSE, 2015, N = 100,540).

Variables	Violence victimization			
	DV	SV	FV	KV
	N (%)	N (%)	N (%)	N (%)
Prevalence	14,167 (14.5)	4,064 (4.0)	5,480 (5.7)	7,988 (7.9)
Region	p = 0.002	p = 0.002	p <0.001	p <0.001
North	3,426 (14.0)	1,267 (5.3)	1,489 (5.9)	2,364 (9.7)
Northeast	4,993 (14.2)	1,279 (3.9)	1,610 (4.8)	2,411 (6.9)
Central-Western	2,055 (14.7)	613 (4.4)	1,026 (7.6)	1,340 (9.6)
Southeast	2,656 (15.2)	587 (3.7)	936 (6.0)	1,270 (7.9)
South	1,185 (12.9)	378 (4.2)	522 (5.5)	733 (7.8)
School type	p = 0.004	p <0.001	p <0.001	p <0.001
Public	11,731 (14.8)	3,602 (4.4)	4,911 (6.1)	6,988 (8.4)
Private	2,584 (13.0)	522 (2.0)	672 (3.4)	1,130 (5.3)
Gender	p = 0.001	p = 0.009	p <0.001	p <0.001
Male	6,529 (13.8)	1,734 (3.7)	3,751 (7.9)	5,218 (10.6)
Female	7,786 (15.1)	2,390 (4.3)	1,832 (3.7)	2,900 (5.4)
Age	p <0.001	p <0.001	p <0.001	p <0.001
≤13	2,163 (13.8)	428 (2.4)	504 (3.7)	789 (5.0)
14	6,800 (13.5)	1,726 (3.3)	2,221 (4.6)	3,458 (6.8)
15	3,253 (16.2)	1,091 (5.6)	1,600 (8.2)	2,209 (10.5)
≥16	2,099 (17.4)	879 (7.3)	1,258 (10.2)	1,662 (13.4)
Skin color/race	p <0.001	p <0.001	<0.001	p <0.001
White	4,215 (13.1)	1,153 (3.3)	1,583 (4.9)	2,336 (7.0)
Black	2,129 (16.8)	632 (5.2)	1,032 (8.6)	1,355 (10.6)
Brown	6,597 (14.5)	1,900 (4.1)	2,446 (5.5)	3,693 (7.8)
Yellow	746 (18.1)	228 (5.5)	265 (5.9)	353 (7.8)
Indigene	615 (16.1)	208 (5.1)	252 (6.7)	3,784 (10.1)
Maternal schooling (years)	p <0.001	p <0.001	p <0.001	p <0.001
0	974 (19.5)	365 (7.7)	491 (9.5)	617 (11.2)
1 to 8	3,580 (15.1)	1,134 (4.3)	1,411 (5.9)	2,052 (8.4)
9 to 11	3,343 (14.6)	878 (3.5)	1,173 (4.9)	1,763 (7.3)
≥12	2,985 (13.0)	756 (3.4)	1,082 (5.2)	1,588 (7.0)
Cohabitation	p <0.001	p <0.001	p <0.001	p <0.001
Neither parent	1,108 (17.2)	462 (7.1)	519 (8.1)	703 (11.4)
Only with mother	5,165 (16.9)	1,487 (4.8)	1,838 (6.1)	2,804 (8.5)
Only with father	735 (15.2)	271 (5.8)	365 (8.9)	500 (10.2)
Both parents	7,285 (12.9)	1,896 (3.2)	2,849 (5.1)	4,096 (7.1)
Alcohol consumption (month)	p <0.001	p <0.001	p <0.001	p <0.001
No	8,940 (11.4)	2,333 (2.8)	2,705 (3.6)	4,018 (4.8)
Yes	5,357 (24.5)	1,788 (8.0)	2,862 (12.7)	4,082 (17.8)
Illicit drugs use (month)	p <0.001	p <0.001	p <0.001	p <0.001
No	13,031 (13.7)	3,546 (3.7)	4,422 (4.8)	6,638 (6.7)
Yes	1,273 (33.0)	573 (12.4)	1,155 (27.8)	1,470 (35.4)

private schools. FV increased according to the respondent's age. Boys (PR = 1.43; 95%CI 1.22; 1.67) and girls (PR = 1.69; 95%CI 1.30; 2.18) who self-declared their skin color/race as black

showed the highest frequencies of victimization by firearm compared to those of skin color/race white. The occurrence of FV tends to decrease as maternal schooling increases in both sexes. Boys

Table 3. Domestic Violence (DV), Sexual Violence (SV), Firearm-related Violence (FV) and Knife-related Violence (KV) gross analysis, stratified by gender, according to demographic, socioeconomic and behavioral characteristics (PeNSE, 2015, N = 100,540).

Variables	DV			SV			FV			KV		
	Boys	Girls		Boys	Girls		Boys	Girls		Boys	Girls	
	PR (95%CI)	PR (95%CI)	p	PR (95%CI)	PR (95%CI)	p	PR (95%CI)	PR (95%CI)	p	PR (95%CI)	PR (95%CI)	p
Region	p=0.061	p=0.030		p=0.161	p<0.001		p<0.001	p<0.001		p<0.001	p<0.001	
North	1.17 (1.03; 1.33)	1.01 (0.90; 1.13)	1.36 (1.06; 1.75)	1.21 (1.00; 1.47)	1.10 (0.93; 1.29)	1.06 (0.83; 1.35)	1.17 (1.02; 1.34)	1.40 (1.15; 1.71)				
Northeast	1.17 (1.04; 1.32)	1.04 (0.94; 1.16)	1.21 (0.95; 1.53)	0.77 (0.64; 0.94)	0.93 (0.79; 1.09)	0.83 (0.66; 1.04)	0.88 (0.77; 1.01)	0.96 (0.79; 1.15)				
Central-Western	1.15 (1.02; 1.31)	1.12 (1.00; 1.26)	1.28 (1.00; 1.64)	0.91 (0.73; 1.12)	1.30 (1.11; 1.54)	1.53 (1.21; 1.94)	1.12 (0.98; 1.29)	1.47 (1.21; 1.80)				
Southeast	1.21 (1.06; 1.39)	1.16 (1.03; 1.30)	1.14 (0.84; 1.53)	0.73 (0.58; 0.92)	1.06 (0.88; 1.28)	1.17 (0.89; 1.52)	0.97 (0.83; 1.13)	1.09 (0.88; 1.35)				
South	1	1	1	1	1	1	1	1				
School type	p=0.175	p=0.011		p<0.001	p<0.001		p<0.001	p<0.001		p<0.001	p<0.001	
Public	1.09 (0.96; 1.23)	1.18 (1.04; 1.34)	1.92 (1.47; 2.51)	2.45 (1.95; 3.09)	1.78 (1.43; 2.21)	1.83 (1.41; 2.39)	1.41 (1.23; 1.61)	1.98 (1.58; 2.48)				
Private	1	1	1	1	1	1	1	1				
Age												
≤13	1.14 (0.98; 1.31)	1.21 (1.06; 1.39)	2.07 (1.41; 3.02)	2.59 (1.96; 3.42)	2.20 (1.72; 2.81)	1.76 (1.23; 2.52)	1.85 (1.51; 2.27)	2.11 (1.60; 2.78)				
14	1.23 (1.06; 1.43)	1.31 (1.14; 1.50)	2.42 (1.58; 3.71)	3.84 (2.86; 5.18)	2.57 (2.04; 3.24)	2.33 (1.60; 3.39)	2.30 (1.89; 2.81)	2.66 (1.98; 3.56)				
15	p=0.001	p<0.001	p=0.006	p<0.001	p<0.001		p<0.001	p<0.001		p<0.001	p<0.001	
≥16	1	1	1	1	1	1	1	1				
1.22 (1.08; 1.37)	1.38 (1.23; 1.56)	1.57 (1.21; 2.04)	1.61 (1.26; 2.04)	1.61 (1.26; 2.04)	1.61 (1.37; 1.88)	1.84 (1.42; 2.38)	1.38 (1.21; 1.59)	1.66 (1.34; 2.06)				
1.05 (0.95; 1.15)	1.16 (1.06; 1.27)	1.11 (0.87; 1.42)	1.32 (1.11; 1.58)	1.10 (0.96; 1.27)	1.29 (1.06; 1.59)	1.29 (1.06; 1.59)	1.09 (0.97; 1.23)	1.29 (1.09; 1.51)				
1.40 (1.13; 1.75)	1.37 (1.15; 1.62)	1.57 (1.04; 2.37)	1.72 (1.28; 2.31)	1.20 (0.93; 1.57)	1.46 (1.03; 2.08)	1.46 (1.03; 2.08)	1.19 (0.95; 1.49)	1.20 (0.89; 1.62)				
1.17 (0.96; 1.43)	1.30 (1.07; 1.58)	1.28 (0.82; 2.01)	1.83 (1.29; 2.59)	1.19 (0.88; 1.61)	1.69 (1.05; 2.72)	1.69 (1.05; 2.72)	1.36 (1.07; 1.71)	1.57 (1.12; 2.21)				
1.52 (1.27; 1.82)	1.48 (1.27; 1.73)	2.07 (1.52; 2.81)	2.56 (1.87; 3.50)	1.61 (1.27; 2.03)	2.64 (1.91; 3.65)	2.64 (1.91; 3.65)	1.58 (1.31; 1.90)	1.08 (0.86; 1.35)				
1.13 (1.00; 1.28)	1.18 (1.05; 1.33)	0.97 (0.75; 1.27)	1.61 (1.28; 2.02)	1.08 (0.90; 1.29)	1.42 (1.05; 1.92)	1.42 (1.05; 1.92)	1.13 (0.98; 1.30)	1.49 (1.20; 1.86)				
1.11 (0.99; 1.24)	1.15 (1.01; 1.30)	0.86 (0.63; 1.17)	1.26 (0.98; 1.62)	0.90 (0.76; 1.08)	1.12 (0.84; 1.49)	1.12 (0.84; 1.49)	1.05 (0.90; 1.22)	1.83 (1.39; 2.40)				
Maternal schooling (years)												
0	1	1	1	1	1	1	1	1				
1 to 8	p<0.001	p<0.001	p=0.031	p<0.001	p<0.001		p<0.001	p<0.001		p<0.001	p<0.001	
9 to 11	1.36 (1.17; 1.58)	1.30 (1.15; 1.48)	1.31 (1.00; 1.73)	2.93 (2.39; 3.59)	1.76 (1.46; 2.12)	1.57 (1.22; 2.02)	1.72 (1.46; 2.03)	1.67 (1.36; 2.06)				
≥12	1.22 (1.11; 1.34)	1.37 (1.27; 1.48)	1.23 (1.04; 1.45)	1.75 (1.48; 2.06)	1.30 (1.14; 1.48)	1.14 (0.95; 1.38)	1.24 (1.12; 1.38)	1.25 (1.08; 1.44)				

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Table 3. Domestic Violence (DV), Sexual Violence (SV), Firearm-related Violence (FV) and Knife-related Violence (KV) gross analysis, stratified by gender, according to demographic, socioeconomic and behavioral characteristics (PeNSE, 2015, N = 100,540).

Variables	DV			SV			FV			KV		
	Boys	Girls		Boys	Girls		Boys	Girls		Boys	Girls	
	PR (95%CI)	PR (95%CI)		PR (95%CI)	PR (95%CI)		PR (95%CI)	PR (95%CI)		PR (95%CI)	PR (95%CI)	
Cohabitation	1.08 (0.89; 1.30)	1.31 (1.09; 1.57)	1.23 (0.87; 1.72)	2.69 (1.98; 3.65)	1.54 (1.21; 1.96)	1.95 (1.36; 2.79)	1.30 (1.06; 1.60)	1.50 (1.07; 2.09)				
Neither parent	1	1	1	1	1	1	1	1				
Only with mother	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001				p<0.001
Only with father	1	1	1	1	1	1	1	1				1
Both parents	2.14 (1.97; 2.33)	2.14 (1.99; 2.30)	3.27 (2.78; 3.84)	2.53 (2.19; 2.92)	3.82 (3.42; 4.27)	3.34 (2.84; 3.93)	3.72 (3.39; 4.08)	3.94 (3.47; 4.47)				
Alcohol consumption (month)	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001				p<0.001
No	1	1	1	1	1	1	1	1				1
Yes	2.14 (1.97; 2.33)	2.14 (1.99; 2.30)	3.27 (2.78; 3.84)	2.53 (2.19; 2.92)	3.82 (3.42; 4.27)	3.34 (2.84; 3.93)	3.72 (3.39; 4.08)	3.94 (3.47; 4.47)				
Illicit drugs (month)	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001				p<0.001
No	1	1	1	1	1	1	1	1				1
Yes	2.35 (2.09; 2.63)	2.50 (2.20; 2.85)	3.56 (2.86; 4.42)	3.30 (2.56; 4.25)	5.40 (4.78; 6.10)	5.98 (4.93; 7.24)	4.80 (4.28; 5.37)	5.68 (4.78; 6.75)				

from mothers with schooling greater than or equal to 12 years of age showed a reduction from 66% to 93% in FV (PR = 0.78; 95%CI 0.66; 0.93). FV was about three times higher among boys and about 2.4 times higher among girls who consumed alcohol the last month. Girls who reported illicit drug use were three times more likely to have FV than those who did not report drug use in the previous month, a pattern also observed among boys.

KV was more frequent among boys from the Northern (PR = 1.16; 95%CI 1.01; 1.33) and girls from the Center-West (PR = 1.51; 95%CI 1.24; 1.84). Girls in public schools were twice as likely to be victims of KV than students in private schools, while in boys this probability was 40% higher than those of private schools. Black and Indigenous schoolchildren had the highest prevalence of KV in comparison to students of skin color/race white, being even higher among girls than among boys. An increase in maternal schooling was associated with a decrease in KV among boys. The same pattern was observed among the girls, but this difference was not statistically significant. Boys living with neither parent had about 70% more likely to be involved in KV compared to those living with both parents. Schoolchildren of both sexes who reported using alcohol and illicit drugs had a 2 to 3 times higher prevalence of VOC compared to those who did not report the use of these substances.

Discussion

The results indicate a higher DV and SV prevalence among girls and FV and KV among boys. The literature showed that, since DV and SV are aggressions occurring within the family and romantic relationships, it tends to contribute to the development of emotional and behavioral dysfunction, which destabilizes the victim's long-term interpersonal relationships^{12,16}. In other studies, FV and KV were associated with past violence exposure to aggressive behavior of peers¹⁷ and the use of illicit drugs were associated as risk factors¹⁸. This scenario may allow emotional desensitization to violent situations and subsequent development of externalizing behaviors, such as impulsiveness – a predictor of involvement in fights with weapons – similar to that found in other studies. Among the four analyzed violence, DV was the most prevalent, as a found by a systematic review that gathered 43 studies on violence and showed the high prevalence of physical abuse in

Table 4. Domestic Violence (DV), Sexual Violence (SV), Firearm-related Violence (FV) and Knife-related Violence (KV) adjusted analysis, stratified by gender, according to demographic, socioeconomic and behavioral characteristics (PeNSE, 2015, N = 100,540).

Variables	DV		SV		FV		KV	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)
Level 1								
Region	p=0.050	p=0.013	p=0.172	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001
North	1.17 (1.03; 1.32)	1.01 (0.90; 1.13)	1.35 (1.05; 1.73)	1.20 (0.98; 1.45)	1.09 (0.92; 1.28)	1.05 (0.82; 1.33)	1.16 (1.01; 1.33)	1.38 (1.14; 1.68)
Northeast	1.17 (1.04; 1.33)	1.05 (0.95; 1.17)	1.24 (0.98; 1.58)	0.79 (0.66; 0.96)	0.95 (0.81; 1.12)	0.85 (0.67; 1.06)	0.90 (0.79; 1.03)	0.98 (0.81; 1.18)
Midwest	1.16 (1.02; 1.32)	1.13 (1.01; 1.27)	1.31 (1.02; 1.68)	0.94 (0.75; 1.16)	1.33 (1.13; 1.57)	1.57 (1.24; 1.99)	1.14 (0.99; 1.30)	1.51 (1.24; 1.84)
Southeast	1.22 (1.07; 1.39)	1.17 (1.04; 1.32)	1.17 (0.87; 1.58)	0.76 (0.61; 0.95)	1.09 (0.91; 1.31)	1.20 (0.92; 1.57)	0.98 (0.84; 1.15)	1.13 (0.91; 1.39)
Southern	1	1	1	1	1	1	1	1
School type	p=0.132	p=0.007	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001
Public	1.10 (0.97; 1.24)	1.20 (1.05; 1.36)	1.92 (1.47; 2.52)	2.37 (1.89; 2.98)	1.78 (1.43; 2.21)	1.86 (1.42; 2.43)	1.39 (1.21; 1.60)	1.97 (1.57; 2.47)
Private	1	1	1	1	1	1	1	1
Level 2								
Age	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001
≤13	1	1	1	1	1	1	1	1
14	0.91 (0.80; 1.05)	1.03 (0.91; 1.16)	1.14 (0.78; 1.66)	1.47 (1.12; 1.94)	1.23 (0.98; 1.55)	1.06 (0.74; 1.53)	1.24 (1.02; 1.49)	1.38 (1.06; 1.79)
15	1.14 (0.98; 1.32)	1.20 (1.05; 1.38)	1.95 (1.34; 2.84)	2.31 (1.75; 3.05)	2.14 (1.67; 2.73)	1.66 (1.16; 2.38)	1.82 (1.48; 2.22)	1.95 (1.49; 2.57)
≥16	1.23 (1.06; 1.44)	1.31 (1.14; 1.49)	2.23 (1.48; 3.34)	3.38 (2.50; 4.56)	2.51 (1.99; 3.17)	2.29 (1.58; 3.30)	2.26 (1.85; 2.77)	2.48 (1.85; 3.32)
Skin color/race	p=0.010	p<0.001	p=0.065	p<0.001	p<0.001	p=0.001	p=0.001	p=0.006
White	1	1	1	1	1	1	1	1
Black	1.16 (1.03; 1.31)	1.34 (1.18; 1.51)	1.34 (1.03; 1.75)	1.43 (1.13; 1.81)	1.43 (1.22; 1.67)	1.69 (1.30; 2.18)	1.28 (1.11; 1.47)	1.48 (1.18; 1.85)
Brown	1.37 (1.10; 1.71)	1.36 (1.14; 1.62)	1.45 (0.96; 2.21)	1.70 (1.26; 2.29)	1.16 (0.89; 1.51)	1.44 (1.01; 2.05)	1.16 (0.93; 1.45)	1.15 (0.85; 1.56)
Yellow	1.02 (0.93; 1.13)	1.15 (1.04; 1.27)	1.00 (0.78; 1.29)	1.24 (1.03; 1.50)	1.04 (0.90; 1.21)	1.27 (1.02; 1.57)	1.05 (0.92; 1.19)	1.19 (1.00; 1.41)
Indigene	1.15 (0.94; 1.40)	1.30 (1.06; 1.58)	1.16 (0.74; 1.82)	1.72 (1.22; 2.44)	1.12 (0.84; 1.51)	1.67 (1.03; 2.72)	1.31 (1.03; 1.66)	1.48 (1.05; 2.08)
Level 3								
Maternal schooling (years)	p=0.009	p<0.001	p<0.001	p=0.066	p=0.002	p<0.001	p=0.035	p=0.062
0	1.40 (1.14; 1.71)	1.41 (1.19; 1.66)	1.37 (1.00; 1.88)	1.53 (1.07; 2.20)	1.14 (0.88; 1.46)	2.05 (1.43; 2.95)	1.25 (1.02; 1.54)	1.28 (0.95; 1.74)
1 to 8	1.09 (0.95; 1.25)	1.15 (1.20; 1.29)	0.75 (0.57; 0.98)	1.18 (0.91; 1.52)	0.86 (0.72; 1.03)	1.18 (0.86; 1.63)	0.98 (0.84; 1.14)	1.17 (0.93; 1.47)
9 to 11	1.08 (0.96; 1.23)	1.10 (0.98; 1.24)	0.72 (0.53; 0.99)	1.03 (0.79; 1.35)	0.78 (0.66; 0.93)	0.98 (0.73; 1.32)	0.97 (0.83; 1.13)	0.92 (0.73; 1.15)
≥12	1	1	1	1	1	1	1	1

it continues

Table 4. Domestic Violence (DV), Sexual Violence (SV), Firearm-related Violence (FV) and Knife-related Violence (KV) adjusted analysis, stratified by gender, according to demographic, socioeconomic and behavioral characteristics (PeNSE, 2015, N = 100,540).

Variables	DV		SV		FV		KV	
	Boys PR (95%CI)	Girls PR (95%CI)	Boys PR (95%CI)	Girls PR (95%CI)	Boys PR (95%CI)	Girls PR (95%CI)	Boys PR (95%CI)	Girls PR (95%CI)
Cohabitation	p=0.004	p<0.001	p=0.108	p<0.001	p<0.001	p=0.442	p<0.001	p=0.428
Neither parent	1.30 (1.08; 1.58)	1.14 (0.97; 1.34)	1.28 (0.93; 1.76)	2.25 (1.71; 2.96)	1.50 (1.18; 1.91)	1.11 (0.78; 1.58)	1.67 (1.38; 2.01)	1.15 (0.87; 1.51)
Only with mother	1.15 (1.04; 1.28)	1.35 (1.24; 1.47)	1.22 (1.01; 1.47)	1.64 (1.36; 1.98)	1.21 (1.04; 1.41)	1.10 (0.90; 1.36)	1.13 (1.00; 1.28)	1.12 (0.94; 1.34)
Only with father	1.04 (0.79; 1.37)	1.30 (1.06; 1.60)	0.94 (0.63; 1.42)	2.13 (1.51; 3.00)	1.54 (1.14; 2.10)	1.37 (0.90; 2.07)	1.36 (1.08; 1.71)	1.28 (0.86; 1.89)
Both parents	1	1	1	1	1	1	1	1
Level 4								
Alcohol consumption (month)	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001
No	1	1	1	1	1	1	1	1
Yes	1.94 (1.76; 2.14)	1.93 (1.77; 2.11)	2.73 (2.22; 3.36)	1.89 (1.56; 2.28)	2.83 (2.45; 3.27)	2.37 (1.89; 2.97)	2.98 (2.66; 3.34)	3.09 (2.61; 3.65)
Illicit drugs use (month)	p<0.001	p<0.001	p<0.001	p=0.002	p<0.001	p<0.001	p<0.001	p>0.001
No	1	1	1	1	1	1	1	1
Yes	1.40 (1.21; 1.62)	1.61 (1.35; 1.92)	2.02 (1.52; 2.69)	1.60 (1.19; 2.14)	2.69 (2.30; 3.14)	3.08 (2.36; 4.03)	2.36 (2.06; 2.71)	2.78 (2.17; 3.55)

this population, mostly perpetrated by the victim's relatives¹⁹. About SV, this study identified the intimate partners as the principal authors of the abuse. Also, there is a tendency of SV underreporting when it perpetrated by an intimate partner, since it is less likely to be recognized by the victims as abuse²⁰. Therefore, girls suffered more violence by the family and in romantic relations. This violence profile may contribute to the development of reactivity, ruminations, and impulsivity²¹.

The boys had a higher frequency of FV and KV involvement. This was also found in school-based studies in France¹⁷ and Thailand¹⁸ with schoolchildren aged 11 to 19 years. These studies emphasize that victimization by past violence, aggressive behavior of peers¹⁷ and illicit drugs use were associated as risk factors¹⁸. In Brazil, the FV victim's profile shows that the main risk behaviors were illicit drug use and drug trade²². The literature suggests that the development of risk behaviors can derive from exposure to multiple contexts of violence in the past, enabling an emotional desensitization in the face of violent situations and subsequent development of externalizing behaviors, such as impulsivity – a predictor of involvement in gun fights¹⁶.

The DV and SV were also more frequent among the population who declared their skin color/race as yellow. FV and KV were more prevalent among those who reported their skin color as black. In the first case, no studies were found to indicate and explain the high violence prevalence against this population in Brazil^{23,24}. In the second case, knowing that the use of weapons in fights is associated with an increased risk of severe injury or death¹, the Youth Violence Vulnerability Index 2017 discussed the armed violence prevalence by homicide trends among teenagers. The results indicated that young blacks are 2.7 times more likely to suffer from this type of violence than white-skinned young people²⁵. This scenario suggests a racial inequality concerning victimization by armed violence in Brazil, which may reflect the material and social disadvantages to which this population is exposed to¹⁴.

The four violence analyzed forms were more prevalent according to the age's increase, similar to the findings by Emergency Services survey in Brazil in 2014 about DV⁶, and in the studies of Devries et al.¹⁹ in relation to SV by intimate partners and by Bègue et al.¹⁷ regarding armed violence. The explanation by the ecological model is that the violence occurrence encompasses risk factors, including characteristics of adolescents, caregivers, the local community, and social,

economic and cultural aspects¹³. For example, among family risk factors, a member could have conflicts and vulnerabilities such as alcohol and illicit drug abuse¹⁸, a caregiver could be overloaded and had discipline beliefs and correction for aggression²⁶. Also, age itself signals a many changes period that can lead exposure to risk beyond adult supervision²⁷. Moreover, teenagers aged 16 years or over are not in the expected age range for the 9th year of elementary school, indicating a possible school delay of the population at risk of this study. In the literature, there was a significant association between school failure and victimization of violence^{17,27}.

About the alcohol and illicit drugs consumption, although this study design admits reverse causality, the literature indicates bidirectionality in this association, both psychoactive substances can precede violence, and violence can precede the use of these substances^{28,29}. For the first case explanation, alcohol and drugs act directly under the individual's cognitive functioning, making it difficult for impulse control, risk perception, and strategic planning to come out of dangerous situations²⁹⁻³¹. For the second case, victims of violence may consume and seek substances as a coping strategy, even if ineffective, for emotional modulation³²⁻³⁴.

This study also found a higher violence prevalence among the children of mothers without schooling and among public school students, as evidenced in previous PeNSE editions^{35,36}. This finding may reflect a social vulnerability since low schooling can lead to instability in the labor field and consequently, low family income. As a result, caregivers may also spend more time away from home and underemployment, which would undermine the teenager's supervision³⁷. Moreover, about the family structure, in this study violence was more frequent among those who did not cohabit with both parents, similar to that found in a school-based survey with 8,494 students up to 18 years in Sweden³⁸. This scenario indicates a probable fragile family network, with poor support, where the teenager's insertion can lead to the violence victimization³⁹.

About the violence occurring in the macro-regions of Brazil, in this study DV was more frequent in the Southeast, and FV and KF were more prevalent in the Central West and North, respectively, similar to that found in the PeNSE 2012 edition³⁶. The SV was also more frequent in the Northern, as shown in a study that compared the SV prevalence in four Brazilian capitals and indicated Belém as the highest number of cases⁴⁰.

The violence associated factors are critical indicators to be considered for intervention planning to reduce violence and its consequences. However, besides the common risk factors, there are protective factors that can minimize violence occurrence and its damages. An example of an interpersonal violence prevention program that focused on protective factors is the Fast Track in the United States. The focus was on the social skills development, emotional regulation and problem solving, with individuals aged 6 to 11 years and, after 15 years of follow-up, it was shown the effectiveness of the program by reducing risk behaviors and conduct problems associated with the armed violence occurrence⁴¹. The intervention effectiveness was also due to its broad approach since the plan involved the target audience, the parents and caregivers, as well as teachers and school staff⁴¹.

In Brazil, studies on violence interventions have focused on teachers and health professionals training. For teachers, because of the many violence cases discovered at school, and the teacher may not feel prepared to deal with the violence which their students are subjected to⁴². Also, training is important to stimulate discussion about the violence phenomenon and encourage interventions implementation⁴². Moreover, the actions should be articulated with other areas committed to guaranteeing the children rights, such as Health. Also, the literature showed that to intervene in violence cases, health services has challenges, including the systems of notification use, as well as difficulties to referrals of victims to mental health networks¹⁰. Thus, it is necessary to invest in training the health and education teams.

Finally, as a PeNSE advantage, it highlighted the importance of school-based survey Brazil, given its national coverage and the sample representativeness. This is in addition to the fact that the majority of violence research tends to use secondary records and data from health services or systems, sustaining an underreporting bias in the results. Besides, since violence cases can often be omitted or denied, due to fear and shame, PeNSE drew up the research from the self-applied questionnaire, providing information confidentiality. The study limitations are related to the instrument used to measure violence in the school context, once the information was collected by the self-report, based on an extensive survey, not allowing the use of scales to measure violence. Still, PeNSE does not reach students with school dropout and absenteeism, which are factors associated with situations of violence⁴³.

Conclusions

PeNSE has been giving visibility to several conditions to which adolescents are exposed, including violence, which is a significant public health problem that aggravates the teenager's vulnerability. The 2015 results indicated a higher prevalence of armed violence among boys and domestic physical violence and sexual violence among girls, especially among older adolescents, public school students, children of mothers with low schoo-

ling, who lived without parents and who used of alcohol or illicit substances.

The findings highlight the importance of public social protection policies and encourage intervention strategies implementation. These strategies can be designed to work directly with teenagers, especially in the school environment, once this environment may be conducive to interventions, since it may reach more individuals in a given period, as well as may include training of health and education teams.

Collaborations

TN Munhoz and FBP Terribele participated in the design of the study, analysis and interpretation of data, interpretation of results and writing of all versions of the manuscript. All authors critically reviewed and approved the final version.

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