



ORIGINAL ARTICLE

Victims, bullies and bully–victims: prevalence and association with negative health outcomes from a cross-sectional study in São Paulo, Brazil

Ana Paula Loch¹ · Roberta Corradi Astolfi² · Maria Alvim Leite² · Cassio Henrique Gomide Papa² · Marcelo Ryngelblum² · Manuel Eisner^{3,4} · Maria Fernanda Tourinho Peres⁵

Received: 10 February 2020 / Revised: 9 September 2020 / Accepted: 11 September 2020

© Swiss School of Public Health (SSPH+) 2020

Abstract

Objectives To estimate the prevalence of self-reported bullying as victims, bullies or bully–victims among 9th grade adolescents in the city of São Paulo, Brazil; to investigate association between bullying with negative health outcomes.

Methods Cross-sectional data were obtained in 2017 from a sample of Brazilian adolescents ($n = 2680$) using a structured, self-administered questionnaire. Bivariate and multivariate Poisson regression were employed to assess in which extent the experience of bullying in position of victim, bully or bully-victim affects adolescents' health.

Results Prevalence of bullying victimization was 18.3%, while victimization/perpetration and perpetration corresponded to 10.42% and 4.9%, respectively. Adolescents who experienced bullying victimization were more likely to present high levels of internalizing symptoms, to report self-harm, to present negative self-rated health and to use tobacco, when compared with those not involved. Bullies were more likely to use alcohol and to binge drinking. bully–victims presented a higher prevalence of all health outcomes, except for tobacco use.

Conclusions Our findings highlight the effect of bullying in adolescents' health, regardless of the position. Planned intersectoral efforts between parents, health and education systems to prevent bullying could therefore reduce negative health outcomes during adolescence.

Keywords Victims · Bullies · Bully-victim · Adolescent · Negative health outcomes

✉ Maria Fernanda Tourinho Peres
mftperes@usp.br

Ana Paula Loch
anapaulaloch@gmail.com

Roberta Corradi Astolfi
roberta.astolfi@usp.br

Maria Alvim Leite
maria.alvim.leite@gmail.com

Cassio Henrique Gomide Papa
cassiopapa@gmail.com

Marcelo Ryngelblum
marceloryn@gmail.com

Manuel Eisner
mpe23@cam.ac.uk

¹ Centro de Referência e Treinamento em DST/AIDS do Estado de São Paulo, CRT-DST/AIDS, São Paulo, Brazil

² Departamento de Medicina Preventiva, Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil

³ Institute of Criminology, University of Cambridge, Cambridge, UK

⁴ Jacobs Center for Productive Youth Development, University of Zurich, Zurich, Switzerland

⁵ Departamento de Medicina Preventiva, Faculdade de Medicina, Universidade de São Paulo, Av. Dr. Arnaldo, 455 - 2o. andar - sala 2177, São Paulo, São Paulo 01246-903, Brazil

Introduction

The World Health Organization (WHO) recognizes bullying as one of the most frequent types of violence among children and adolescents, with severe effects on both health and development (World Health Organization 2016; Leiner et al. 2014). According to Olweus, the act of bullying is intentional and persistent, anchored in an unbalance of power between victims and aggressors (Olweus 1997). Despite commonly being considered an isolated episode, bullying is a pattern of relationship based on violence in its different forms including physical, social, psychological, verbal or sexual (Olweus 1997). Additionally, bullying is a dynamic phenomenon in which adolescents may occupy exchangeable roles as victims, bullies or bully–victims (BV) (Leiner et al. 2014; Pellegrini et al. 1999).

The negative effects of bullying on adolescents' health have long been recognized. Since the late 1990s, there has been increasing scientific research exploring the differences between victims, bullies and BV considering risk factors and health consequences (Leiner et al. 2014; Pellegrini et al. 1999; Yang and Salmivalli 2013; Solberg et al. 2007). Victims of bullying are at a higher risk of depression, internalizing symptoms (IS), negative self-rated health (SRH), lower life satisfaction, suicidal ideation and self-harm behaviors (SH) (Le et al. 2017; Chester et al. 2017; Gobina et al. 2008; Roh et al. 2015; Callaghan et al. 2019; Kontak et al. 2019). The existence of an association between victimization and alcohol, tobacco or drug use (DU), however, is not a consensus (Durand et al. 2013). On the other hand, bullying perpetration is associated with delinquent behavior, suicidal ideation and self-harm, drug use and a poor school adjustment (Radliff et al. 2012).

According to Solberg et al. (2007), BV should be considered as a distinct group of behavior, with differences and similarities, for both bullies and victims (Solberg et al. 2007). When compared with individuals not exposed to bullying practices, BV experience a broader range of emotional, relational and behavioral problems, and a poorer school adjustment (Leiner et al. 2014; Pellegrini et al. 1999; Yang and Salmivalli 2013; Solberg et al. 2007). Similar to pure victims, BV present a higher risk of IS, depression and anxiety, negative SRH, and lower life satisfaction when compared to those not involved with the practice. BV are also at higher risk for DU and delinquent behavior (Gobina et al. 2008; Radliff et al. 2012; Kelly et al. 2015).

Most studies regarding the prevalence of bullying involvement as bully, victim or BV, as well as its association with negative health outcomes, are concentrated in European and North American countries, providing a conceptual support about how bullying may affect

adolescent health. Very little evidence from Latin American countries are documented in the literature. Such countries present high levels of violence, as can be seen through homicide rates (WHO 2014). Brazil is recognized as one of the most violent countries in the world (WHO 2014), with homicide as the primary cause of death among individuals of 15–19 years old. Furthermore, the fragility of the Brazilian education system is well-documented by the Program for International Student Assessment (PISA 2015). In a scenario with high levels of violence toward adolescents combined with a fragile educational system, children's socialization eventually incorporates the use of violence as a means of resolving conflicts. Davis et al. (2018) studied the effect of long-term exposure to community violence (ECV) on bullying victimization and perpetration and found that ECV is associated with aggressive behavior and victimization. Moreover, ECV during childhood is associated with the development of aggressive cognitions and behavior in later elementary school grades (Guerra et al. 2003), suggesting a long-term and sustained effect. The effect of ECV on bullying is moderated by individual traits (low self-control), delinquent peer group membership and parental monitoring (Low and Espelage 2014). Bachinni et al. (2009) demonstrated that adolescents' perception of danger and violence in the neighborhood is also associated with bullying perpetration (either purely or in association with victimization). A possible explanation is that chronic ECV affects children's and adolescents' cognition and problem-solving skills, thus shaping defensive strategies.

Swearer and Hymel (2015), following the diathesis-stress model, propose that involvement in bullying should be considered a negative life event per se, leading to internalizing and externalizing behaviors when mixed with cognitive, biological and social vulnerabilities (Swearer and Hymel 2015). Bullying, according to this framework, is imbedded in a network of stressors that shape adolescents' cognition and behavior, as well as physiological and psychological responses. Victimization activates negative self-schemas and self-perception, relating to a hostile interpretation of the world and the future, thereby enhancing the risk for IS and negative SRH. Bullying perpetration, in turn, would be the response to a threat schema (Swearer and Hymel 2015) supporting negative beliefs about others, fomenting the development of aggressive behaviors and attitudes, and enhancing the risk for externalizing and rule-breaking behaviors. Additionally, acute and chronic stresses are related to drug use and vulnerability to drug abuse, with evidence supporting that stress is associated with both initiation and escalation of drug use in adolescence (Sinja 2008). Lastly, Swearer and Hymel (2015) claim that early life-stressful events, as well as prolonged and repeated stress are associated with low

self-control and raise the risk for substance abuse and maladaptive behaviors in adolescence (Swearer and Hymel 2015).

In Brazil, the prevalence of bullying varies between 17.6% (Moura et al. 2011) and 22.9% (Isolan et al. 2013), the prevalence of victimization from 7.4 to 41.1%, while the prevalence of perpetration varies from 7.1 to 29.1% (Malta et al. 2019; Reisen et al. 2019). Additionally, according to Fleming and Jacobsen (2010), the prevalence of victimization in the previous month in 19 LMIC (Low-to-Middle-Income Country) ranges from 7.8 to 60.9%. Socioeconomic factors such as income inequality and violence levels, as well as cultural norms, influence bullying and should be considered aiming at a better understanding of cross-country differences in bullying prevalence (Elgar et al. 2012). Income inequality and negative life circumstances during childhood contribute to interpersonal distrust, and favors the perception about unfairness and injustice which, by its turn, influences social cognitions and, consequently, children and adolescents' behaviors (Arsenio and Gold 2006). Although the uniqueness of the bully, victim or bully-victim groups, evidence regarding the prevalence, as well as the association with negative health outcomes in highly violent and unequal countries, such as Brazil, are scarce. Therefore, the purpose of this study was to estimate the prevalence of involvement in bullying in three different subgroups (victims, bullies and BV) among adolescents in São Paulo, Brazil, and to investigate its association with IS, SH, DU and negative SRH after adjusting for potential confounders.

Methods

This is a cross-sectional study—The São Paulo Project on the social development of children and adolescents (SP-PROSO)—conducted in São Paulo, Brazil, with a representative sample of 9th grade elementary school students in public and private schools in the city of São Paulo (CSP). The 9th grade is the final grade of mandatory elementary school in Brazil. The target sample of schools was randomly selected using a stratified sampling procedure pertaining classes as the primary sampling units. The minimum sample size in São Paulo was determined as 2849 students to allow for estimates as low as 15% with a precision of 0.06 and $d_{eff} = 1.7$. A total of 156 classes from 156 schools were randomly selected and 119 agreed to participate. Eligible adolescents were the ones present in the classrooms on the day of data collection, whose parents did not proscribe their participation and who did not present any serious impairment that could avoid understanding the questions or the possibility of answering them anonymously. From the 2816 students present in classrooms, 113

did not participate. Overall, a total of 2702 adolescents participated in the study, or 94.5% of the initial estimated sample. However, 22 questionnaires were excluded from the analysis because more than 20% of the questions were not answered. Therefore, the final sample for the present analysis was composed of 2680 students. Data collection was performed on a predetermined day during class time without the presence of teachers. Students answered the paper–pencil survey anonymously with the support of trained researchers.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Ethical Committee of the University of São Paulo (Protocol Number: 1.719.856); Ethical Committee of Ministry of Health in Brazil (Protocol Number: 2.014.816)) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Instruments and measures

The current survey was designed to allow for comparative analysis with the data collected at the 6th wave of the cohort study “Zurich project on the social development from childhood to adolescence” (Z-PROSO) (Eisner and Ribeaud 2007), in 2013, and the cross-sectional survey “Montevideo project on the social development of children and adolescents (M-PROSO) (Trajtenberg and Eisner 2015), in 2013. The instrument and scales used in Montevideo and Zurich were translated to Portuguese from English, German and Spanish following recommendations for culturally sensitive translations (Behr and Shishido 2016; Eisner and Ribeaud 2007). The translation was performed by four independent translators, including two from German, one from English and one from Spanish, and checked for consistence between the languages by experts in the three countries. Translation involved skilled translators, parallel translations, reconciliation and synthesis through comparison between the four languages versions of the questionnaire and a final check with the original designers of the instrument (Nivette et al. 2020). After translation into Portuguese the complete instrument was pretested in a sample of 116 students to check for phrasing, understanding of the questions and the logical structure of the survey. Any additional change was discussed and approved by the experts from the three countries to keep comparability. For this paper we use only São Paulo Data.

In our study, a set of distinct scales and instruments were used. For each one, reliability (Cronbach's α) and a confirmatory factor analysis (CFA) were performed to check for psychometric properties. Model fit for each case

are presented when describing the variable. In all the cases a unidimensional solution was achieved.

Bullying was measured using a 10-item scale (Alsaker 2012; Murray et al. 2019) with five questions about victimization (Cronbach's α : 0.70. Confirmatory factor analysis (CFA): Loadings: 0.43–0.47; $\chi^2 = 36.206$ (4df); $p < 0.001$; RMSEA = 0.05; CFI: 0.987) and five about perpetration (Cronbach's α : 0.71; CFA: Loadings: 0.36–0.67; $\chi^2 = 30.779$ (4df); $p < 0.001$; RMSEA = 0.05; CFI: 0.988). Answers were developed in a Likert scale from never (1) to almost every day (6). Individuals who answered any question at least as "about once a month" were considered involved in bullying. Involvement was categorized as the following: no involvement (0), victims (1), bullies (2) and BV (3).

Alcohol, marijuana and tobacco consumption in the previous year (yes/no) and binge drinking (5 or more drinks at the same moment) in the previous month (yes/no) were investigated.

Internalizing symptoms (IS) were investigated through eight statements (Cronbach's α : 0.72; CFA: Loadings: 0.47–0.77; $\chi^2 = 132.492$ (18df); $p < 0.001$; RMSEA = 0.049; CFI: 0.983) concerning symptoms of anxiety and depression in the last month, derived from the Social Behavior Questionnaire (Tremblay et al. 1991). Answers were also formatted in a Likert scale from never (1) to very often (5). A mean score was calculated and divided into terciles where the ones at the upper third were classified as presenting high levels of IS. One additional statement asked about *self-harm (SH)* (I harmed myself on purpose—cut my arm, tore wounds open, hit my head, tore out my hair) and those who responded this question as never were coded as 0, while all the others were coded as 1.

Self-rated health (SRH) was evaluated through a single question from the National Health Survey of Brazil in 2013 (Szwarcwald et al. 2014): "In general, how do you think is your health?" The answer could vary from very good (5), to very bad (1). Adolescents with "regular," "bad" or "very bad" responses were grouped into the negative self-rated health group (1) and all the others were grouped as the reference group (0). The reference group comprised only those who clearly expressed a positive health perception (Good and very good).

Adjusting variables

Sociodemographic and family information such as age, gender (male/female), skin color (black/non-black), type of school (public/private) and divorced/never married parents (yes/no) were investigated. Family socioeconomic status was determined considering the possession of consumer goods and the presence of a paid housekeeper at home, as proposed by PeNSE 2012 (Malta et al. 2014). Weighted

mean score was calculated, and divided into terciles of low, medium and high family socioeconomic status.

The *participation in a deviant peer group (DPG)* was assessed through two questions from the Eurogang Survey (Weerman et al. 2009). The questions asked if the adolescent is part of a group of peers (yes/no) and if the members of the group do illegal things together (yes/no). Those who responded yes for both were considered part of a deviant group (1), while all the others were included as the reference group (0).

Low-self-control (LSC) was measured with a short version of the scale developed by Grasmick et al. (1993) and composed by ten statements (Cronbach's $\alpha = 0.75$; CFA: Loadings: 0.13–0.71; $\chi^2 = 188.776$ (23df); $p < 0.001$; RMSEA = 0.05; CFI: 0.95). Answers were organized in a Likert scale from totally disagree (1) to totally agree (4). Based on the mean score, self-control was divided into quartiles and those at the top quarter were coded as having LSC and all the others were coded as zero (0).

Adolescents perception about their parents' *positive parenting style (PPS)* was assessed using 11 items (Cronbach's $\alpha = 0.82$; CFA: Loadings: 0.20–0.70; $\chi^2 = 341.843$ (41df); $p < 0.001$; RMSEA = 0.05; CFI: 0.96) from the Alabama Parenting Questionnaire (Shelton et al. 1996). Answers were arranged in a Likert scale ranging from never (1) to often/always (4). Mean scores were divided into quartiles and those at the upper quarter were coded as frequently perceiving a PPS (1).

Data analysis

The analysis was conducted in Stata 15.1 considering the complex sampling structure with sampling weights calculated as the inverse probability of sampling fraction. A descriptive analysis was performed based on proportions and 95% confidence intervals (CI). Mean, standard errors and 95% CI were calculated for continuous and discrete variables. The Chi square test was employed to assess the associations between bullying and adjusting variables and bullying and health outcome variables.

The magnitude of the association between bullying and each of the health outcomes was investigated through simple and multivariable Poisson regression models. An initial crude Prevalence Ratio (PR) was calculated. Subsequently, adjusted models including gender, age and socioeconomic status as adjusting variables were run, independently of p value. For all other covariates, those with p values equal or lower than 0.2 in bivariate analysis were included in the multivariate models.

Results

Regarding the sample, 47.4% of the participants were females. The average age of participants was 14.8 years old, ranging from 12.85 to 18.9. Around 50% declared to have black skin color and 43.3% had divorced parents. Additional characteristics of the sample are described in Table 1.

A total of 33.5% of the adolescents were involved with bullying, mostly as victims [18.3% (IC 95% 16.7–20)]. BV were reported by 10.42% (IC 95% 9.1–11.9) and 4.9% (IC 95% 4.0–5.9) were bullies (Table 2). Females were more frequently self-reported victims than males. Males, who declared having black skin color and who studied in public schools were more frequently bullies and BV. Adolescents part of a deviant peer group and those with LSC were

Table 1 Characteristics of the sample composed of 9th grade students from elementary schools ($n = 2680$). São Paulo, Brazil, 2017

Variables	%	95% CI ^a	Mean; Std. Err. (95% CI)
Gender			
Male	52.60	50.90–54.29	–
Female	47.40	45.70–49.09	–
Age			
Less than 15	72.24	69.63–74.7	14.5 (14.48–14.52)
15	21.21	19.05–23.52	15.41 (15.38–15.44)
More than 15	6.55	5.34–8.01	16.68 (16.58–16.79)
Skin color			
Black	49.07	48.10–53.74	–
Non-black	50.92	46.25–51.89	–
Divorced/single parents			
No	56.36	53.74–58.95	–
Yes	43.63	41.04–46.25	–
Socioeconomic position (tercile)			
Low	33.56	30.65–36.61	3.50; 0.05 (3.40–3.60)
Medium	34.52	31.89–37.25	6.82; 0.03 (6.75–6.88)
High	31.90	29.00–34.94	10.90; 0.11 (10.69–11.19)
Type of school			
Public	69.74	67.83–71.59	–
Private	30.25	28.40–32.16	–
Is part of a deviant group			
No	87.97	85.57–90.01	–
Yes	12.02	9.98–14.42	–
Low self-control			
No	80.88	79.11–82.54	2.06; 0.01 (2.06–2.09)
Yes	19.11	17.45–20.90	2.92; 0.01 (2.90–2.95)
Frequent positive parental practice			
No	76.78	74.77–78.68	2.83; 0.01 (2.80–2.86)
Yes	23.21	21.31–25.22	3.68; 0.01 (3.67–3.70)

^a95% CI confidence interval

associated with a higher prevalence of being victims, bullies and BV. Lastly, perceived frequent PPS was associated with lower prevalence of bullying involvement in all groups.

Almost 30% of the adolescents presented high levels of IS (Table 3). The mean score for the whole group was 2.73 (Std. Err = 0.02); 3.9 (Std. Err = 0.02) for those in the upper third and 2.3 (Std. Err = 0.01) for the others. At least one episode of SH was reported by 21.96%, and a total of 28.9% displayed a negative SRH. Use of alcohol in the previous year was reported by 59% of the adolescents, while 28.3% referred to at least one episode of binge drinking in the previous month. 18.3% and 11.6% of students reported the use of tobacco and marijuana, respectively. Females presented higher prevalence of all the negative health outcomes and health risk behavior, when compared to males, except for marijuana use ($p > 0.05$). Further, prevalence of alcohol, tobacco and marijuana use, and binge drinking, raised according to age group. Except for SH, the prevalence is higher for individuals with divorced/never married parents. Additionally, students from public schools presented higher prevalence of negative SRH, alcohol use and binge drinking. The ones who were also part of a DPG were associated with higher prevalence of all outcomes, except for a negative SRH. Having LSC and frequent PPS were associated with all the outcomes: for those with LSC the prevalence was higher, while for those with frequent PPS the prevalence was lower.

The crude and adjusted associations between bullying and each of the health outcomes and bullying and health risk behaviors are presented in Table 4. IS, SH and a negative SRH were associated with bullying involvement as victims and BV, even after adjusting for potential confounders. Alcohol consumption and binge drinking were also associated with bullying involvement as bullies and BV, while tobacco was only associated with victims, considering potential confounders. Marijuana use was associated with bullying only in bivariate association.

Discussion

The aim of the present study was to estimate the prevalence of self-reported bullying among adolescents in the 9th grade of elementary school in São Paulo, Brazil, and to investigate its association with drug use, IS, SH and SRH. To capture the independent effect of bullying involvement on the different negative health outcomes, the models were adjusted for a broad range of potential confounders to better understand the association between bullying and adolescents' health.

According to the results, one-third of adolescents reported involvement with bullying within the 12 months prior to the survey. A wide variation in the prevalence of bullying is reported in the literature, from 9% in Sweden to

Table 2 Prevalence of Bullying among 9th grade elementary students and its association with selected covariates. ($n = 2680$). São Paulo, Brazil, 2017

Variables	No involvement % (95% CI ^a)	Victim % (95% CI)	Bully % (95% CI)	Bully-victim % (95% CI)
Total	66.45 (64.21–68.63)	18.26 (16.68–19.97)	4.85 (3.99–5.88)	10.42 (9.08–11.92)
Gender***				
Male	66.76 (63.82–69.57)	14.35 (12.31–16.67)	6.57 (5.18–8.31)	12.31 (10.32–14.62)
Female	66.29 (62.8–69.6)	22.86 (20.24–25.71)	2.93 (1.99–4.29)	7.93 (9.19–10.1)
Age				
Less than 15	66.96 (64.49–69.34)	18.32 (16.37–20.45)	4.35 (3.30–5.71)	10.37 (8.78–12.21)
15	64.05 (59.17–68.66)	20.47 (16.79–24.72)	5.52 (3.58–8.41)	9.97 (7.64–12.9)
More than 15	66.65 (64.38–68.84)	18.25 (16.59–20.03)	4.79 (3.95–5.79)	10.32 (8.95–11.87)
Skin color**				
Black	65.42 (62.39–68.33)	16.88 (14.79–19.20)	5.61 (4.29–7.29)	12.09 (10.06–14.46)
Non-black	67.26 (64.41–69.99)	19.67 (17.39–22.17)	4.21 (3.15–5.61)	8.86 (7.29–10.73)
Divorced parents*				
No	63.97 (60.95–66.88)	18.99 (16.76–21.45)	5.94 (4.52–7.76)	11.11 (9.26–13.26)
Yes	68.49 (65.91–70.95)	17.66 (15.75–19.75)	4.08 (3.06–5.41)	9.78 (8.04–11.84)
Socioeconomic position				
Low	68.41 (63.97–72.54)	17.73 (14.66–21.28)	4.61 (3.18–6.65)	9.24 (7.26–11.7)
Middle	65.78 (62.03–69.33)	17.92 (15.16–21.06)	5.03 (3.68–6.83)	11.28 (9.13–13.85)
High	65.27 (61.10–69.21)	19.92 (17.07–23.11)	4.39 (2.9–6.61)	10.42 (8.42–12.83)
Type of school*				
Particular	66.82 (63.11–70.33)	19.56 (17.0–22.40)	3.38 (2.41–4.72)	10.24 (8.20–12.73)
Public	66.3 (63.49–69.0)	17.71 (15.75–19.84)	5.49 (4.37–6.89)	10.5 (8.84–12.42)
Is part of a delinquent peer group***				
No	68.87 (66.35–71.29)	17.95 (16.36–19.66)	4.22 (3.36–5.29)	8.96 (7.61–10.52)
Yes	5.0 (4.27–5.72)	20.01 (15.22–25.84)	8.15 (5.31–12.32)	21.84 (17.21–27.29)
Low self-control***				
No	69.85 (67.23–72.35)	17.63 (15.81–19.61)	3.81 (3.03–4.78)	8.71 (7.40–10.23)
Yes	52.06 (47.27–56.8)	20.90 (17.09–25.29)	9.32 (6.56–13.08)	17.72 (14.3–21.77)
Frequent positive parental practice***				
No	63.19 (60.65–65.65)	19.98 (18.06–22.05)	5.64 (4.61–6.88)	11.2 (9.7–12.89)
Yes	77.13 (72.87–80.89)	12.7 (10.34–15.51)	2.26 (1.29–3.95)	7.91 (5.73–10.82)

^a95% CI confidence interval; *** $p < 0.001$, ** $p < 0.05$, * $p < 0.2$

45% in Lithuania (Craig et al. 2009), while in Brazil, previous studies report prevalence ranging between 17.6% (Moura et al. 2011) and 22.9% (Isolan et al. 2013). It is widely known the difficulties to compare bullying prevalence across studies, because of the distinct terms and measurements employed. Our results are, however, in line with the recognition of bullying as a frequent type of violence during adolescence. Such findings present important implication to health police and practice, considering the pervasive effect of bullying in adolescents' health reported in the literature.

The results of the present study differ from previous ones (Yang and Salmivalli 2013; Nansel et al. 2004; Schwartz et al. 2001; Zych et al. 2018) since the prevalence of BV exceeds that of pure bullying but is lower than that of pure victims. Despite some few exceptions (Kozasa

et al. 2017), the prevalence of BV is usually lower than the prevalence of pure victims and pure bullies. In Brazil, only one study was found to have investigated the prevalence of pure victims, pure bullies and BV in which the prevalence of BV exceeded both pure victimization and perpetration (Isolan et al. 2013).

BV are widely recognized as having worse social adjustment, as presenting poorer health outcomes and as being exposed to more social, relational and individual risk factors for bullying during childhood and adolescence (Leiner et al. 2014; Pellegrini et al. 1999; Chester et al. 2017; Yang and Salmivalli 2013; Solberg et al. 2007; Gobina et al. 2008; Radliff et al. 2012; Kelly et al. 2015). The higher prevalence of BV found in our study could be explained, at least partially, by the high levels of violence in Brazil (WHO 2014), the huge social inequality and the

Table 3 Prevalence of negative health outcomes and health risky behavior among 9th grade elementary students and its association with selected covariates ($n = 2680$). São Paulo, Brazil, 2017

	Internalizing symptoms	Self-harm	Negative self-rated health	Alcohol	Binge drinking	Tobacco	Marijuana
Total % (95% CI)	29.76 (27.85–31.75)	21.96 (19.88–24.20)	28.87 (26.64–31.21)	59.03 (56.26–61.75)	28.26 (26.09–30.53)	18.28 (16.25–20.50)	11.58 (9.67–13.81)
Gender (%)							
Female	45.4***	26.42***	36.84***	64.74***	32.38***	20.69**	12.13
Male	15.75	17.74	21.84	54.18	24.62	16.09	10.78
Age (%)							
Less than 15	30.87*	22.52	28.83*	56.15***	26.29***	14.57***	8.02***
15	29.68	19.69	31.03	67.51	37.34	28.18	20.75
More than 15	22.22	24.92	23.00	68.45	39.66	28.00	22.01
Skin color (%)							
Black	27.14**	22.5	30.45	59.0	28.38	17.5	12.34
Non-black	32.28	21.41	27.04	59.37	28.17	19.31	10.95
Divorced/single parents (%)							
Yes	31.53*	20.25**	30.56*	63.25***	31.51**	21.71**	13.61**
No	28.18	24.11	27.15	55.7	25.59	15.65	9.98
Socioeconomic position (%)							
Low	30.59	23.29	32.45*	58.89	28.07	18.06	10.62
Medium	30.45	22.32	28.85	60.34	27.36	16.83	11.37
High	29.59	19.26	25.29	60.45	31.42	20.27	11.81
Type of school (%)							
Public	29.01	21.19	30.81**	60.72*	30.16**	18.23	12.24
Private	31.51	22.31	24.42	55.19	24.03	18.4	10.12
Is part of a delinquent peer group (%)							
No	28.25***	20.65***	28.3	55.63***	23.53***	13.8***	6.82***
Yes	41.66	30.39	31.78	87.32	61.55	50.57	46.37
Low self-control (%)							
No	26.04***	19.25***	27.01**	54.23***	23.53***	13.72***	8.32***
Yes	45.65	33.66	36.59	80.00	52.98	37.68	25.00
Frequent positive parental practice (%)							
No	32.07***	24.27***	31.83***	61.45***	30.22**	19.61**	12.61**
Yes	22.27	14.49	19.21	51.35	21.83	13.93	8.20

*** $p < 0.001$, ** $p < 0.05$, * $p < 0.2$

fragility of the educational system (PISA), what imposes additional challenges to socialization, and amplifies adverse childhood experiences (ACE). According to Soares et al. (2016), the prevalence of at least one ACE in a Brazilian sample ($n = 3951$) was around 80%, a higher percentage than those found in developed countries. Chronic Exposure to Community Violence, for example, affects children's and adolescents' cognition and problem-solving skills, thus shaping defensive strategies (Davis et al. 2018; Guerra et al. 2003). In a multi-country study with data from HBSC, Elgar et al. (2012) reported a

positive association between the prevalence of Bullying victimization, perpetration and both victimization and perpetration with income inequality. According to the authors, such association is partially mediated by community violence level, measured through homicide rates. Negative life circumstances during childhood such as poverty, inequality and exposure to violence affect children's perceptions of unfairness and injustice, influence social cognitions and behaviors (Arsenio and Gold 2006), such as bullying. More comparative studies are therefore fundamental to help the comprehension of these

Table 4 Crude and adjusted association between *bullying* and negative health outcomes among 9th grade elementary students ($n = 2680$). São Paulo, Brazil, 2017

	PR crude (IC 95%)	<i>p</i>	PR adjusted (IC 95%)*	<i>p</i>
Internalizing symptoms ^a				
Victim	2.24 (1.98–2.53)	< 0.001	1.86 (1.63–2.13)	< 0.001
Bully	1.08 (0.72–1.63)	0.689	1.15 (0.82–1.62)	0.398
Bully-victim	1.69 (1.38–2.07)	< 0.001	1.62 (1.34–1.97)	< 0.001
Self-harm ^b				
Victim	2.18 (1.79–2.67)	< 0.001	1.96 (1.62–2.37)	< 0.001
Bully	1.37 (0.94–2.00)	0.099	1.06 (0.71–1.58)	0.776
Bully-victim	1.93 (1.53–2.42)	< 0.001	1.68 (1.30–2.19)	< 0.001
Negative health perception (Ref: good/very good) ^c				
Victim	1.66 (1.40–1.95)	< 0.001	1.53 (1.28–1.82)	< 0.001
Bully	1.48 (1.10–2.00)	0.010	1.30 (0.96–1.23)	0.084
Bully-victim	1.67 (1.38–2.01)	< 0.001	1.72 (1.41–2.11)	< 0.001
Alcohol in the previous year ^d				
Victim	1.14 (1.04–1.25)	< 0.001	1.03 (0.93–1.13)	0.571
Bully	1.38 (1.21–1.57)	< 0.001	1.21 (1.06–1.40)	0.007
Bully-victim	1.31 (1.18–1.46)	< 0.001	1.22 (1.09–1.36)	< 0.001
Binge drinking in the previous month ^d				
Victim	1.33 (1.11–1.61)	0.003	1.05 (0.87–1.27)	0.413
Bully	1.85 (1.42–2.41)	< 0.001	1.32 (1.12–1.54)	0.025
Bully-victim	1.68 (1.41–1.99)	< 0.001	1.31 (1.20–1.54)	0.001
Tobacco in the previous year ^b				
Victim	1.66 (1.33–2.06)	< 0.001	1.33 (1.07–1.66)	0.010
Bully	2.10 (1.53–2.89)	< 0.001	1.31 (0.93–1.83)	0.117
Bully-victim	1.77 (1.39–2.25)	< 0.001	1.20 (0.95– 1.51)	0.112
Marijuana in the previous year ^b				
Victim	1.51 (1.06–2.15)	0.022	1.16 (0.80–1.66)	0.435
Bully	2.34 (1.52–3.63)	< 0.001	1.43 (0.97–2.10)	0.07
Bully-victim	2.29 (1.66–3.17)	< 0.001	1.32 (0.94–1.86)	0.106

^aAdjusted for: gender, socioeconomic position, age, skin color, divorced parents, frequent positive parental practices, illegal groups, low self-control

^bAdjusted for: gender, socioeconomic position, age, divorced parents, frequent positive parental practices, illegal groups, low self-control

^cAdjusted for: gender, socioeconomic position, age, type of school, divorced parents, frequent positive parental practices, low self-control

^dAdjusted for: gender, socioeconomic position, age, type of school, divorced parents, frequent positive parental practices, illegal groups, low self-control

discrepancies, considering contextual differences among countries, such as levels of violence, social inequality and the exposure to ACE.

According to the existing literature, our study suggests that involvement with bullying, irrespective of the position as a victim, perpetrator or both, is associated with a set of negative health outcomes after adjusting for a broad set of potential confounders such as parental divorce/never married, PPP, LSC, participation in DPG and sociodemographic characteristics. The results indicate that bullying victimization is associated with IS, SH, negative SRH and tobacco use. On the other hand, bullying perpetration is associated with alcohol use and binge drinking, while

victimization/perpetration is associated with all the outcomes except tobacco and marijuana use. These results are in accordance with those of previous studies, demonstrating that bullying victimization is associated with internalizing behaviors, a negative health perception and suicidality, and that bullying perpetration is also linked to externalizing and delinquent behaviors as well as to drug use. On the other hand, victimization-perpetration relates to both set of effects, suggesting a more complex situation for this group of adolescents (Leiner et al. 2014; Pellegrini et al. 1999; Chester et al. 2017; Yang and Salmivalli 2013; Solberg et al. 2007; Gobina et al. 2008; Radliff et al. 2012; Kelly et al. 2015).

Unlike other studies (Radliff et al. 2012), an independent association of bullying involvement and marijuana use was not found. The association, which is significant in the crude model, lost its statistical significance after adjusting for participation in DPG and LSC. It is noteworthy that marijuana use is the sole illegal behavior included in our study. According to Durand et al. (2013), the cumulative continuity theory proposes that the relationship between aggressive behavior and illegal drug use could express the attraction between adolescents with aggressive behavior for DPG, which would reinforce their involvement in deviant behavior and substance use (Durand et al. 2013). This is in line with the results, which contradicts an independent effect between bullying and marijuana use.

The association between involvement with bullying and tobacco use is also reported in the literature, with some divergences in the results. Positive association between bullying perpetration and tobacco use was reported, with similar results for BV. Pure victimization, however, presents distinct results with some studies reporting a risk and others a protective effect. In this study, an independent significant effect was only found for bullying victimization, while the effect for pure bullying and BV was not significant when adjusting for confounders. Studies reporting a higher likelihood of smoking among bullying victims consider that smoking can be a coping mechanism by either reducing anxiety or increasing self-image and self-worth (Durand et al. 2013).

Negative consequences of violence victimization are well documented in the literature, as well as the structure response services to minimize suffering and possible effects on physical and mental health of children and adolescents (World Health Organization 2016). Less known are the negative health outcomes related to perpetration, and to the superposition of the two conditions. The pervasive effects of bullying are extensive and affect victims, bullies and BV. In accordance with other researches, our study shows that adolescents involved with bullying present negative health outcomes and health risk behaviors and that those involved as BV present a broad range of effects. This study confirms previous results and expands on them while adjusting for a broad range of confounders in a scenario of a fragile educational system with high violence levels and social inequality. This is a substantial contribution to bullying research since, according to Durand et al. (2013), little research takes into account intrapersonal and environmental-based factors, such as family relationships and DPG, to explore the independent effect of bullying on health outcomes.

The evidence of negative health outcomes related to bullying, for all types of involvement, has some practical implications, especially concerning the framing of responses to those involved as perpetrators, considering

that public advocacy usually lacks empathy with those presenting aggressive behavior (Swearer and Hymel 2015). Bullying intervention should therefore focus on reducing bullying involvement as victims, perpetrators and BV to consider psychological harm of the involved individuals (Kelly et al. 2019).

Strengths and limitations

While this study offers new strengths in bullying research, it is also important to consider its limitations. First, the cross-sectional design precludes clear analysis about temporal sequences of study variables. SP-PROSO is a school-based survey and only adolescents who attend school and were present on the day of data collection were included, restricting external validity. Adolescents who are not enrolled in schools, dropped-out or are truant are expected to be more frequently involved in bullying, and subsequently, having more negative health outcomes. In this manner, the potential selection bias that would affect the direction or magnitude of the effect measure is not expected. Additionally, it is noteworthy that some of the selected schools refused to participate, of which most were private. Due to a lack of information on those schools, it is not possible to evaluate potential bias. It is possible, though, that our prevalences are underestimated.

We used self-reported information in our survey, which could potentially result in respondent bias, especially considering the sensitive topics approached such as bullying involvement, alcohol and drug use, family relations and socioeconomic status. Concerning socioeconomic status, our survey used the same approach as HBSC Family Affluence Scale (FAS: Currie et al. 2008; Elgar et al. 2012), with questions about material assets. The investigation of SES through questions about material assets is considered adequate for adolescents' self-report surveys, when compared to questions about parental education and income (Elgar et al. 2012). One way to minimize this response bias is to use additional external confirmatory sources, such as school reports on bullying and other misbehaviors, detentions, health data or the inclusion of other informants. Unfortunately, we don't have an information system on school bullying and misbehaviors to collect confirmatory data. Additionally, and more important, it would not be possible to match information for distinct sources, once we used anonymous questionnaires to guarantee confidentiality.

Our survey follows the design of the 6th wave of the "Zurich project for social development from childhood to adolescence (Z-PROSO)" and the cross-sectional survey "Montevideo project for social development of children and adolescents (M-PROSO)". We applied the same set of instruments and methodological strategy. Survey length

could have resulted in fatigue and consequently leading to information bias or a high missingness. Our results, however, are in accordance to international and national literature, and missing answers were not of significant amount. We did not observe an increase in missing responses as the questionnaire approached the end, which could suggest respondent fatigue.

The scales used in our survey are widely used in criminological research and internationally validated. We used a culturally sensitive translation procedure, as describe at methods section, but the scales were not previously validated in Brazil. To deal with this limitation we conducted reliability and CFA analysis for each scale and the results are provided with the variables. We found clear evidence that psychometric properties were kept, such as a good reliability and fit-indexes at CFA for unidimensional solutions.

The study includes beneficial strengths that should be highlighted including being the first study in a LMIC formally testing a broad range of negative health outcomes associated with bullying involvement as pure victims, pure bullies and BV among adolescents. Furthermore, because a broad range of potential confounders were included, for the first time in a LMIC, it was possible to investigate the independent effect of bullying on health outcomes.

Funding The British Academy/Newton Foundation and Fundação de Amparo à Pesquisa do Estado de São Paulo—FAPESP (The Foundation for Research Support of the State of São Paulo) (Process Nr. 2016/222594) provided the funds for the data collection, treatment and article revision upon respective funding. Neither institutions had any role on research decisions such as study design, the collection, analysis and interpretation of data. Fapesp strongly advises funded researchers to publish results of funded projects, but with no intervention on or preview of content.

Compliance with ethical standards

Conflict of interest The authors declare that there is no conflict of interest regarding the publication of this article.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Ethical Committee of the University of São Paulo (Protocol Number: 1.719.856); Ethical Committee of Ministry of Health in Brazil (Protocol Number 2.014.816)) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Informed consent and anonymity All participating schools took part voluntarily. At each school, a meeting was required with parents of students of the selected class, in order to present the project and obtain their consent. Furthermore, a letter and a folder with information on the project were sent to the principals of the schools to be delivered to the parents. Parents' refusal could be informed to the school board, or to the coordination, or yet to the research team, either

by phone, e-mail or in person, during the meeting. For those adolescents whose parents did not refuse participation, a questionnaire was delivered in class for them to fill in individually. Only students whose parents did not refuse the participation and who additionally did agree themselves participated. No information that could identify the student or the school was retained. In the questionnaire, schools and students are identified by a number, so that anonymity cannot be disrespected.

References

- Alsaker FD (2012) *Mutig gegen Mobbing in Kindergarten und Schule*. Hueber Verlag, Berlin
- Arsenio WF, Gold J (2006) The effects of social injustice and inequality on children's moral judgments and behavior: towards a theoretical model. *Cognit Dev* 21:388–400. <https://doi.org/10.1016/j.cogdev.2006.06.005>
- Bacchini D, Esposito G, Affuso G (2009) Social experience and school bullying. *J Community Appl Soc Psychol* 19:17–32. <https://doi.org/10.1002/casp.975>
- Behr D, Shishido K (2016) The translation of measurement instruments for cross-cultural surveys. In: Wolf C, Joye D, Smith TW, Fu Y (eds) *The SAGE handbook of survey methodology*. Sage, London, pp 269–287
- Callaghan M, Kelly C, Molcho M (2019) Bullying and bystander behaviour and health outcomes among adolescents in Ireland. *J Epidemiol Community Health*. <https://doi.org/10.1136/jech-2018-211350>
- Chester KL, Spencer NH, Whiting L et al (2017) Association between experiencing relational bullying and adolescent health-related quality of life. *J Sch Health*. <https://doi.org/10.1111/josh.12558>
- Craig W, Harel-Fisch Y, Fogel-Grinvald H et al (2009) A cross-national profile of bullying and victimization among adolescents in 40 countries. *Int J Public Health*. <https://doi.org/10.1007/s00038-009-5413-9>
- Currie C, Molcho M, Boyce W et al (2008) Researching health inequalities in adolescents: the development of the Health Behaviour in School-Aged Children (HBSC) Family Affluence Scale. *Soc Sci Med*. <https://doi.org/10.1016/j.socscimed.2007.11.024>
- Davis JP, Ingram KM, Merrin GJ et al (2018) Exposure to parental and community violence and the relationship to bullying perpetration and victimization among early adolescents: a parallel process growth mixture latent transition analysis. *Scand J Psychol*. <https://doi.org/10.1111/sjop.12493>
- Durand V, Hennessey J, Wells DS et al (2013) Bullying and substance use in children and adolescents. *J Addict Res Ther*. <https://doi.org/10.4172/2155-6105.1000158>
- Eisner M, Ribeaud D (2007) Conducting a criminological survey in a culturally diverse context: lessons from the Zurich Project on the Social Development of Children. *Eur J Criminol* 4:271–298
- Elgar FJ, Pickett KE, Pickett W et al (2012) School bullying, homicide and income inequality: a cross-national pooled time series analysis. *Int J Public Health*. <https://doi.org/10.1007/s00038-012-0380-y>
- Fleming LC, Jacobsen KH (2010) Bullying among middle-school students in low and middle income countries. *Health Promot Int*. <https://doi.org/10.1093/heapro/dap046>
- Gobina I, Zaborskis A, Pudule I et al (2008) Bullying and subjective health among adolescents at schools in Latvia and Lithuania. *Int J Public Health*. <https://doi.org/10.1007/s00038-008-7041-1>
- Grasmick HG, Tittle CR, Bursik RJ et al (1993) Testing the core implications of Gottfredson and Hirschi's general theory of crime. *J Res Crime Delinq*. <https://doi.org/10.1177/0022427893030001002>

- Guerra NG, Huesmann LR, Spindler A (2003) Community violence exposure, social cognition, and aggression among urban elementary school children. *Child Dev.* <https://doi.org/10.1111/1467-8624.00623>
- Isolan L, Salum GA, Osowski AT et al (2013) Victims and bully–victims but not bullies are groups associated with anxiety symptomatology among Brazilian children and adolescents. *Eur Child Adolesc Psychiatry.* <https://doi.org/10.1007/s00787-013-0412-z>
- Kelly EV, Newton NC, Stapinski LA et al (2015) Suicidality, internalizing problems and externalizing problems among adolescent bullies, victims and bully–victims. *Prev Med.* <https://doi.org/10.1016/j.ypmed.2015.01.020>
- Kelly EV, Newton NC, Stapinski LA et al (2019) Novel approach to tackling bullying in schools: personality-targeted intervention for adolescent victims and bullies in Australia. *J Am Acad Child Adolesc Psychiatry.* <https://doi.org/10.1016/j.jaac.2019.04.010>
- Kontak JCH, Kirk SFL, Robinson L et al (2019) The relationship between bullying behaviours in childhood and physician-diagnosed internalizing disorders. *Can J Public Health.* <https://doi.org/10.17269/s41997-019-00179-3>
- Kozasa S, Oiji A, Kiyota A et al (2017) Relationship between the experience of being a bully/victim and mental health in preadolescence and adolescence: a cross-sectional study. *Ann Gen Psychiatry.* <https://doi.org/10.1186/s12991-017-0160-4>
- Le HTH, Nguyen HT, Campbell MA et al (2017) Longitudinal associations between bullying and mental health among adolescents in Vietnam. *Int J Public Health.* <https://doi.org/10.1007/s00038-016-0915-8>
- Leiner M, Dwivedi AK, Villanos MT et al (2014) Psychosocial profile of bullies, victims, and bully–victims: a cross-sectional study. *Front Pediatr.* <https://doi.org/10.3389/fped.2014.00001>
- Low S, Espelage D (2014) Conduits from community violence exposure to peer aggression and victimization: contributions of parental monitoring, impulsivity, and deviancy. *J Couns Psychol.* <https://doi.org/10.1037/a0035207>
- Malta DC, Porto DL, Crespo CD et al (2014) Bullying in Brazilian school children: analysis of the National Adolescent School-based Health Survey (PeNSE 2012). *Rev Bras Epidemiol.* <https://doi.org/10.1590/1809-4503201400050008>
- Malta DC, Mello FCM, Prado RR et al (2019) Prevalence of bullying and associated factors among Brazilian schoolchildren in 2015. *Cien Saude Colet.* <https://doi.org/10.1590/1413-81232018244.15492017>
- Moura DR, Cruz ACN, Quevedo LA (2011) Prevalência e características de escolares vítimas de bullying. *J Pediatr.* <https://doi.org/10.1590/S0021-75572011000100004>
- Murray AL, Eisner M, Ribeaud D et al (2019) Validation of a brief self-report measure of adolescent bullying perpetration and victimization. *Assessment.* <https://doi.org/10.1177/1073191119858406>
- Nansel TR, Craig W, Overpeck MD et al (2004) Cross-national consistency in the relationship between bullying behaviors and psychosocial adjustment. *Arch Pediatr Adolesc Med.* <https://doi.org/10.1001/archpedi.158.8.730>
- Nivette A, Trajtenberg N, Eisner M et al (2020) Assessing the measurement invariance and antecedents of legal cynicism in São Paulo, Zurich and Montevideo. *J Adolesc.* <https://doi.org/10.1016/j.adolescence.2020.06.007>
- Olweus D (1997) Bully/victim problems in school: facts and intervention. *Eur J Psychol Educ.* <https://doi.org/10.1007/BF03172807>
- Pellegrini AD, Bartini M, Brooks F (1999) School bullies, victims, and aggressive victims: factors relating to group affiliation and victimization in early adolescence. *J Educ Psychol.* <https://doi.org/10.1037/0022-0663.91.2.216>
- PISA (2015) Country Note Brazil 2015. OECD. <https://www.oecd.org/pisa/PISA-2015-Brazil.pdf>
- Radliff KM, Wheaton JE, Robinson K et al (2012) Illuminating the relationship between bullying and substance use among middle and high school youth. *Addict Behav.* <https://doi.org/10.1016/j.addbeh.2012.01.001>
- Reisen A, Viana MC, dos Santos-Neto ET (2019) Bullying among adolescents: are the victims also perpetrators? *Br J Psychiatry.* <https://doi.org/10.1590/1516-4446-2018-0246>
- Roh BR, Yoon Y, Kwon A et al (2015) The structure of co-occurring bullying experiences and associations with suicidal behaviors in Korean adolescents. *PLoS ONE.* <https://doi.org/10.1371/journal.pone.0143517>
- Schwartz D, Proctor LJ, Chien DH (2001) The aggressive victim of bullying. Emotional and behavioural dysregulation as a pathway to victimization by peers. In: Juvonen J, Graham S (eds) *Peers harassment in school. The plight of the vulnerable and victimized.* The Guilford Press, New York, pp 147–174
- Shelton KK, Frick PJ, Wootton J (1996) Assessment of parenting practices in families of elementary school-age children. *J Clin Child Psychol.* https://doi.org/10.1207/s15374424jccp2503_8
- Sinja R (2008) Chronic stress, drug use and vulnerability to addiction. *Ann N Y Acad Sci.* <https://doi.org/10.1196/annals.1441.030>
- Soares ALG, Howe LD, Matijasevich A et al (2016) Adverse childhood experiences: prevalence and related factors in adolescents of a Brazilian birth cohort. *Child Abuse Negl.* <https://doi.org/10.1016/j.chiabu.2015.11.017>
- Solberg ME, Olweus D, Endresen IM (2007) Bullies and victims at school: are they the same pupils? *Br J Educ Psychol.* <https://doi.org/10.1348/000709906X105689>
- Swearer SM, Hymel S (2015) Understanding the psychology of bullying moving toward a social-ecological diathesis-stress model. *Am Psychol.* <https://doi.org/10.1037/a0038929>
- Szwarcwald CL, Malta DC, Pereira CA et al (2014) Pesquisa Nacional de Saúde no Brasil: concepção e metodologia de aplicação. *Cien Saude Colet.* <https://doi.org/10.1590/1413-81232014192.14072012>
- Trajtenberg N, Eisner M (2015) Towards a more effective violence prevention policy in Uruguay. University of Cambridge. <https://www.vrc.crim.cam.ac.uk/vrcresearch/meuruguay/uruguayeng>
- Tremblay RE, Loeber R, Gagnon C et al (1991) Disruptive boys with stable and unstable high fighting behaviour patterns during junior elementary school. *J Abnorm Child Psychol.* <https://doi.org/10.1007/bf00911232>
- Weerman FM, Maxson CL, Esbensen FA et al (2009) Eurogang Program Manual. Background, development, and use of the Eurogang instruments in multi-site, multi-method comparative research. <https://www.escholar.manchester.ac.uk/api/datas/tream?publicationPid=uk-ac-man-scw:58536&datastreamId=FULL-TEXT.PDF>. Accessed 13 Dec 2019
- World Health Organization (2014). Global status report on violence prevention. World Health Organization. https://www.who.int/violence_injury_prevention/violence/status_report/2014/en/. Accessed 13 Dec 2019
- World Health Organization (2016) INSPIRE: seven strategies for ending violence against children. https://www.who.int/violence_injury_prevention/violence/inspire/en/. Accessed 13 Dec 2019
- Yang A, Salmivalli C (2013) Different forms of bullying and victimization: bully–victims versus bullies and victims. *Eur J Dev Psychol.* <https://doi.org/10.1080/17405629.2013.793596>
- Zych I, Ttöfi MM, Llorent V et al (2018) A longitudinal study on stability and transitions among bullying roles. *Child Dev.* <https://doi.org/10.1111/cdev.13195>