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Violence in Brazilian schools: Analysis of the effect of the #Tamojuntto prevention program for bullying and physical violence

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ABSTRACT

A randomized controlled trial was conducted with 6637 7th- and 8th-grade students in 72 public schools in 6 Brazilian cities to evaluate the effects of the European drug prevention program Unplugged, called #Tamojuntto in Brazil. This article evaluates the effects of #Tamojuntto on the prevention of bullying and physical violence. Baseline data were collected from both intervention and control groups prior to program implementation. Follow-up data collection was performed 9 and 21 months later. Generalized estimating equations were used to evaluate changes in the reporting of receiving or practicing bullying and physical violence over time. The program was found to reduce the likelihood of receiving bullying, particularly in the stratum of girls aged 13–15 years at the 9-month follow-up time point. The effect was not sustained at 21 months. There was no significant effect for practicing bullying and for receiving or practicing physical violence.

1. Introduction

Violence is a social and public health issue related to the violation of rights and the reduction and limitation of quality of life (Gontijo, Alves, Paiva, Guerra, & Kappel, 2010). Included in this issue is the occurrence of violent events in schools, which are becoming increasingly common and accepted as normal adolescent behavior (Charlot, 2002). Violence threatens adolescents' integrity and jeopardizes the quality of their education (Eyng, Gisi, & Ens, 2009).

Among the various forms of school violence, bullying deserves attention. It is a complex and heterogeneous phenomenon defined as an intentional 'harm doing' that occurs repeatedly and over time and is related to an imbalance of power between students (Cecen-Celik & Keith, 2016; Jankauskiene, Kardelis, Sukys, & Kardeliene, 2008; Olweus, 1993; Volk, Dane, & Marini, 2014). Bullying includes patterns of offenses such as making fun of others, excluding others and spreading rumors, but it does not include physical harm (Carbone-Lopez, Esbensen, & Brick, 2010; Cecen-Celik & Keith, 2016; Cowie, 2000). This type of injury is widely prevalent among Brazilian students. According to a national survey, 7.2% of 9th-grade students in Brazil reported being victims of this type of bullying every day or nearly every day in the past 30 days (Malta et al., 2014).

Another type of school injury highly prevalent in Brazilian schools is physical violence; 12.9% of 9th-graders in Brazil reported being involved in physically violent episodes within the past month (Malta et al., 2010). Physical violence can be any form of physical aggression with intention to hurt and includes corporal punishment in which physical force is used and that is intended to cause some degree of pain or discomfort (Special Representative of the Secretary-General on Violence against Children, [SRSG on Violence

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against Children], 2012). Physical violence can be differentiated from bullying because the former considers isolated episodes and not a pattern of behaviors that involves mocking, which considered bullying (Chirila & Constantin, 2013; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2017).

School violence is a worldwide problem that notably affects adolescent development and wellbeing (Nansel et al., 2001). During this particular period of life, the brain is still undergoing a maturing process (Spear, 2013), and adolescents are shaping their own personality (Steinberg, 2005) and are thus less able to address emotions and distress (Fisher et al., 2012). Because adolescents naturally display higher reactivity and susceptibility, the effects of school violence victimization and perpetration on mental health might be amplified during that phase of life (Hong et al., 2016; Troop-Gordon, 2017) and might consequently show an association with the development of low self-esteem (Brito & Oliveira, 2013). It is also known that children who are victims of school violence display a tendency for experiencing a life marked by further victimization (Arsenault, Bowes, & Shakoor, 2009), resulting in later depression (Ttofi, Farrington, Losel, & Loeber, 2011). In contrast, violence perpetration is associated with delinquency behaviors and suicide (Farrington, Loeber, Stallings, & Ttofi, 2011).

Another behavior that is widely considered a predictor of school violence victimization and perpetration is the use of tobacco, alcohol and other drugs (Andrade et al., 2012; Bye & Rossow, 2009; Gomes et al., 2006; Ttofi et al., 2011). Compounding the problem, antisocial attitudes, such as fighting and breaking rules, indicate a predisposition for alcohol and drug use (Young, Sweeting, & West, 2008). Thus, the use of substances can support transgressive behavior because the opposite phenomenon also occurs: transgressive behavior can reflect a predisposition for alcohol and drug use and a disruptive behavior pattern (United Nations Office on Drugs and Crime [UNODC], 2013). This two-way phenomenon makes it difficult to define the etiology of the independent behaviors by identifying which one is the cause and which one is the effect but reinforces the association between them and the need to consider that they are grouped.

Considering that substance use and violence tend to co-occur among adolescents and appear to have similar etiologies, studies have indicated that prevention components of these programs can achieve both outcomes (Botvin, Griffin, & Nichols, 2006; Cox et al., 2016; Hahn et al., 2007). Fagan and Catalano (2012) studied the effective components of youth violence prevention programs and showed that school-based programs include components related to the enhancement of students' emotional abilities, the improvement of their communication with others, decision-making skills, coping with stressful situations, and conflict resolution. Such components are also included in drug prevention programs, such as *Unplugged*, even though it is a substance use prevention program (Kreft et al., 2009). This fact might reinforce that life skills training in drug prevention programs can be effective in preventing school violence and vice versa.

The European prevention program *Unplugged*, which is called #Tamojuntó in Brazil (Pedroso, Abreu, & Kinoshita, 2015), was adapted for implementation in Brazilian public schools according to international guidelines and the General Coordination of Mental Health, Alcohol and Other Drugs of the Brazilian Ministry of Health in partnership with the United Nations Office on Drugs and Crime. This program seeks to prevent the use of alcohol and other drugs based on the Global Social Influence Model (Sussman, Arriaza, & Grigsby, 2004) with an approach that focuses on building skills to control social influences, deconstructing normative beliefs and reducing drug use (Faggiano et al., 2008).

This program has been effective in reducing the use of tobacco and marijuana among European students (Faggiano et al., 2010). However, its effect on violence has not been evaluated. The results of the first evaluation of the pilot version of the *Unplugged* program in Brazil suggested a possible effect on the reduction of school violence based on reported improvements in students' interpersonal relationships and the relationships between students and teachers (Medeiros, Cruz, Schneider, Sanudo, & Sanchez, 2016). This possible effect on violence based on the improvement of relationships was considered since both drug use and school violence may be reinforced in the school environment by extrapersonal relationships that induce these behaviors (Reid, Peterson, Hughey, & Garcia-Reid, 2006). Consequently, a good relationship with peers may be a protective factor when considering adolescent violence (Hart, O'Toole, Price-Sharps, & Shaffer, 2007).

Given the previous results, the present study seeks to evaluate the effect of the #Tamojuntó prevention program on the prevalence of reports of physical violence and bullying engaged in and victimized by public school students in Brazil over a 21-month period.

2. Method

2.1. Study design

A randomized controlled trial was conducted using 7th- and 8th-grade students from 72 public elementary schools in six Brazilian cities (São Paulo, Federal District, São Bernardo do Campo, Florianópolis, Tubarão and Fortaleza) between 2014 and 2015, with trial registration at the Brazilian Ministry of Health "Brazilian Register of Clinical Trials - REBEC", number RBR-4 mnv5 g and approval from Universidade Federal de São Paulo Ethics Committee (CEP protocol: #473.498).

The schools were randomized and separated into intervention and control groups. Students in the intervention schools received 12 #Tamojuntó lessons during the first semester of 2014, whereas the control schools did not offer any prevention programs. The initial patterns of violence, drug use, sociodemographic data and other variables were evaluated in both groups using a structured, anonymous and self-reporting questionnaire. Baseline data were collected simultaneously in the control and intervention schools two weeks before the beginning of the implementation of the program in February of 2014. In addition to baseline data collection, two follow-ups with the same questionnaire were completed by students from both groups. The first follow-up was 9 months after the initial data collection (November 2014), and the second follow-up was 21 months after the initial data collection (November 2015), six and eighteen months after the end of the intervention, respectively.

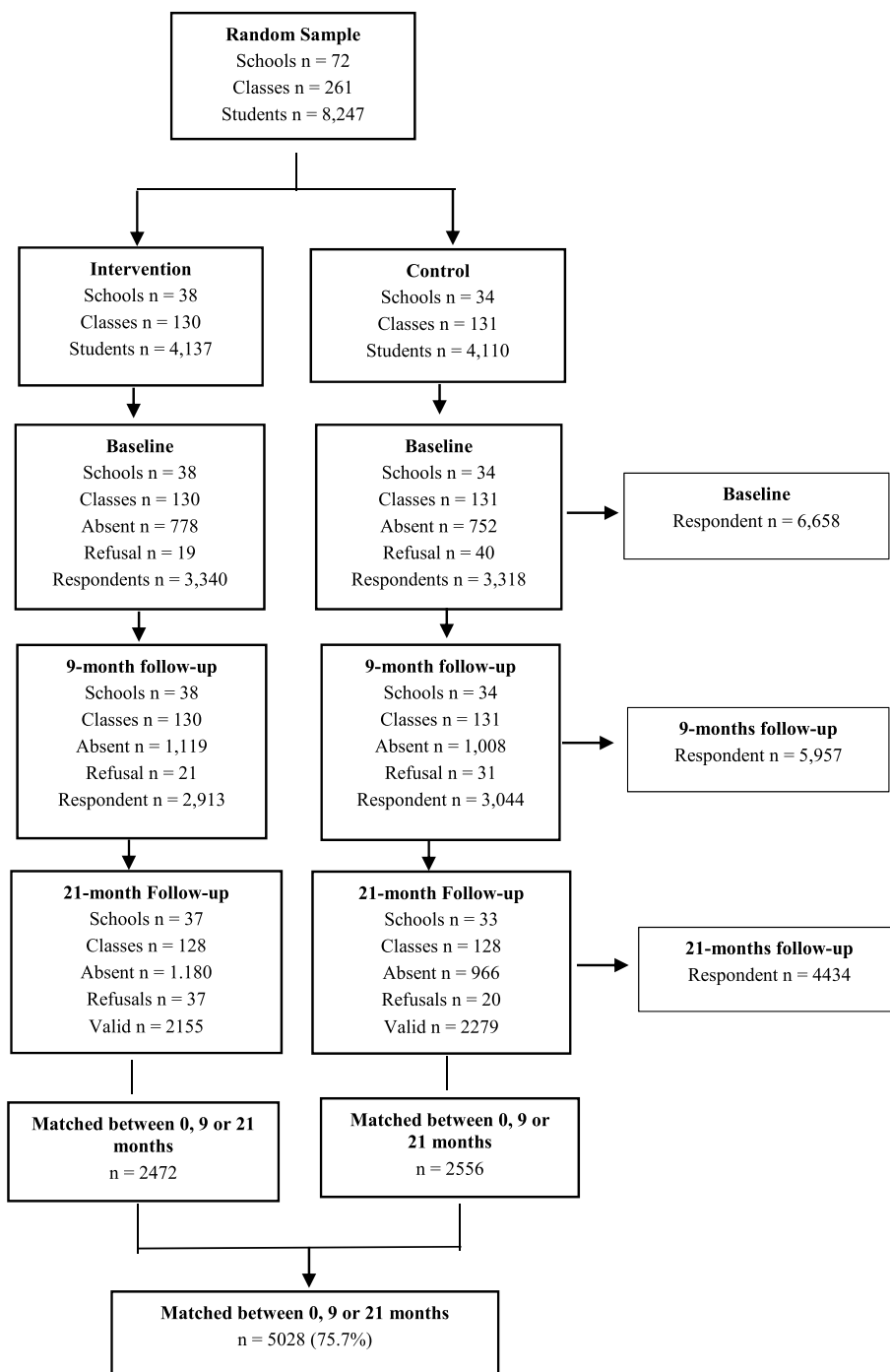


Fig. 1. Flowchart of controlled trial randomized #Tamojunto (Unplugged), 2014/2015.

2.2. Sampling

The required sample size was calculated to be 2835 students per group using the formula presented by Lwanga and Lemeshow (1991) with a power of 80%, the adoption of a significance level of 5% and a difference between groups of 1.5% (i.e., from 5% to 3.5%). Considering a possible 50% loss (25% in the initial time period and 25% during follow-ups, as observed in an initial pilot study (Sanchez et al., 2016)), a sample of 4253 students was included in each group, for a total of 8506 adolescents.

Given that the target population was 13-year-old students (who were expected to be in the 8th grade) and that each school had approximately four 8th-grade classrooms with 30 students each, at least 35 schools each were required for the intervention and

control groups (for a total of 70 schools) to access the number of students necessary to maintain the calculated sample size. Assuming 10%–15% possible refusals among the selected schools, 40 schools were enrolled in each group, as shown in Fig. 1.

In each of the participating cities, 4 to 30 schools (proportionate to the size of the city) were randomly selected from all public schools that offered 8th grade in these locales. Among the schools selected to participate in the study, a simple random drawing determined the group to which the school would be assigned (i.e., whether the school would be in the control group or the intervention group), with a 1:1 allocation ratio always maintained between the number of control schools and intervention schools per municipality.

In each of the intervention group schools, all 8th-graders were invited to participate in the #Tamojunto program, and the school selected one teacher per class to receive the training. In Florianópolis, Tubarão and Fortaleza, some 7th- and 8th-grade classes had the same age profile due to ongoing changes in the series system in Brazil. Thus, 7th grade was included in the study together with 8th grade at the request of the State Education Secretariat of these cities in the schools previously selected based on their 8th year.

Thus, 6658 students participated at the baseline data collection, 5957 were matched at the 9-month follow-up, and 4434 were matched at the 21-month follow-up. We were able to match 5028 adolescents at baseline and at least one follow-up (9 or 21 months), suggesting a total loss of 25% in at least one follow-up.

2.3. Intervention

The *Unplugged* program, which later came to be called #Tamojunto in Brazil, was developed by European Union Drug Abuse Prevention (Kreeft et al., 2009) and comprised 12 classes (four classes on attitudes and knowledge regarding drugs, four classes on interpersonal skills, such as communication and social skills, and four classes on personal skills, which focus on increasing cognitive-behavioral ability) (Kreeft et al., 2009), applied in 50-min weekly classes throughout 12 weeks by teachers and guided by student and teacher manuals. Both manuals are freely available in several languages from the website www.eudap.net.

The teachers who taught the program participated in a 16-h training conducted by coaches trained by the European program developers (the European Union Drug Abuse Prevention senior coaches) during an international workshop so that the training components could be standardized. The coaches were psychologists with experience in school programs. At the end of each lesson, the teachers completed a questionnaire that was used to verify the amount of the program offered in each class. To ensure fidelity and continuity of implementation, the teachers were supervised monthly in person, by email or by telephone by the Ministry of Health coaches who facilitated the initial training. A total of 89% of the 7th- and 8th-grade classes completed the 12 classes of the program. The other 11% finished the program between classes four and 11. Details of the 12 lessons of the program were presented in Medeiros et al. (2016).

The transcultural adaptation of the program was executed by the Brazilian Ministry of Health team (responsible for the implementation and adaptation but not for evaluation), and the program was supervised in the first year (2013) by the European developers. The English version of *Unplugged* was translated into Portuguese but retained the original format and subjects (educational strategies provided in 12 lessons and 3 parent workshops).

2.4. Measures

The instrument used for data collection was created from 3 other questionnaires: 1) the European Union Drug Abuse Prevention questionnaire used in previous studies of the effectiveness of *Unplugged* (Faggiano et al., 2008), adapted to Portuguese (Prado et al., 2016); 2) the questionnaire of the World Health Organization for drug use among students (Carlini et al., 2010); and 3) the Pesquisa Nacional de Saúde do Escolar questionnaire used by the Brazilian Ministry of Health to regularly evaluate middle school students' health risk behaviors, such as violence (Instituto Brasileiro de Geografia e Estatística [IBGE], 2012). From this wider questionnaire, the four outcomes analyzed were based on the following binary (yes/no) questions.

2.5. Bullying

The receipt and practice of bullying were measured by two items in the questionnaire: “In the past 30 days, how often have your classmates scolded you, bullied you, or teased you so much that you were hurt, harassed, annoyed, offended or humiliated?” for the receipt of bullying and “In the past 30 days, have you scolded, mocked, manipulated, intimidated or teased any of your classmates so much that s/he was hurt, annoyed, offended or humiliated?” for the practice of bullying. Originally, the response items were “never”, “sometimes”, and “always”, which we transformed to binary responses (yes/no) by grouping the answers “sometimes” and “always” to obtain the “yes” group, and the response “never” was considered “no”.

2.6. Physical violence

In addition to bullying, the measures of the receipt and practice of physical violence were two items on the questionnaire: “In the past 30 days, have you been physically assaulted at your school?” and “In the past 30 days, have you physically assaulted anyone at your school?”

2.7. Socioeconomic status

Socioeconomic status (SES) was evaluated using the Associação Brasileira de Empresas de Pesquisa scale (*Associação Brasileira de Empresas de Pesquisa [ABEP], 2012*), which considers consumer goods and the education level of the head of the family. This scale categorizes the student on “A” to “E” socioeconomic status, where “A” is the highest and “E” is the lowest level of socioeconomic status. All the students' personal data were collected from the self-report questionnaire, including age and sex. Data regarding state, school and grade were assessed from school records.

The pencil-and-paper questionnaire included thirty-six questions. It was administered by trained graduate students who were clearly presented to the students as researchers from the university. The students took from 40 to 50 min to fill the questionnaire. To reduce any influence of adults on the students' responses, no teacher or school staff remained in the classroom while the field researchers administered the questionnaires. The researchers stayed away from the students' tables and only approached when they were called to help with questions. Although the director and teacher had provided signed consent regarding legal responsibility for the students during school activities, the students had to consent to participate. Participation in the research was not mandatory, and students could decide to return the blank questionnaire rather than completing it. At the end, all the students from the same classroom placed their questionnaires inside a brown envelope to avoid being identified.

To match the students' questionnaires in the three follow-up phases, the students generated a “secret code” that involved letters and numbers created from the following information: name, surname, date of birth, mother's name, and father's and mother's grandmothers' names. In this manner, each code comprised 8 characters (7 letters and 1 number) and could be decoded only by the student. These codes allowed researchers to compare individual questionnaires at different follow-up times during the study and simultaneously protected the participants by providing the anonymity and confidentiality essential to a study of illicit behavior (*Galanti et al., 2007*). To guarantee minimal information bias (false positives) in the questionnaires, a question regarding the use of fictitious drugs (Holoten and Carpinol) was included. This question led to the exclusion of 49 students at the initial data collection time point, 70 students at 9 months and 25 students at 21 months.

2.8. Statistical analysis

The integration of the three obtained databases was conducted by pairing the secret codes using Levenshtein's distance between characters, which identified similarities between the secret codes generated by the adolescents in each of the data collection sessions.

Sociodemographic variables were described as numbers and percentages, and the comparisons between groups were calculated using the Chi-square test.

Longitudinal data (0, 9, and 21 months) were collected within schools and in groups. This means the data were non-independent. Therefore, we used “Generalized Estimated Equation” (GEE) to adjust for the non-independence when assessing the effectiveness of the intervention.

The analyses were performed with the complete sample and stratified by gender and age. All models for the complete sample were adjusted for possible confounding variables (gender, age, socioeconomic status-SES, school and city). In each of the analyses, the odds ratio (OR) was adjusted for the analysis of engaging in or experiencing bullying or physical violence. The OR was obtained with its respective 95% confidence interval (95% CI) associated with the intervention group in addition to the effect of interactions between the time and group, which were designated the “#Tamojuntto Effect”. This effect allowed comparisons between the intervention and control groups based on the modification of engaging in or receiving bullying (physical violence) that occurred between the initial time point and at the 9- and 21-month follow-up. All analyses were performed in STATA/SE 14.02 for Windows with a significance level of 5%.

3. Results

Both study groups were homogeneous in terms of gender and SES ($p > .05$) (see [Table 1](#)). Significant differences were observed in the distribution of the groups between the evaluated cities, age groups and grades ($p < .05$).

[Table 2](#) presents the prevalence of the receipt and practice of bullying during the follow-up sessions by group and stratified by age and gender. Without considering gender and age, the prevalence of reports of the receipt of bullying at the initial time point were 29.4% and 25.6% in the intervention and control groups, respectively, and reached 32.4% and 32.6% at 9 months and 30.9% and 28.9% at 21 months, respectively.

In the analyses stratified by gender and age, girls aged 11–12 years from the control group at 9 months ($p = .047$) and from the intervention group at 21 months ($p = .014$) and those aged 13–15 years at baseline ($p = .003$) reported more incidents of receiving bullying than did boys, as presented in [Table 2](#). The prevalence of this outcome reached 37.8% among girls aged 11–12 years at the 21-month follow-up and 35.3% among girls aged 13–15 years at the 9-month follow-up.

There was a significant effect of the #Tamojuntto program for girls aged 13–15 years at the 9-month follow-up (OR = 0.59, 95% CI [0.42, 0.84] and $p = .003$). However, this effect lost its significance at the 21-month follow-up ($p = .071$). Nevertheless, the same short-term effect of the #Tamojuntto program on the receipt of bullying (OR = 0.81, 95% CI: 0.69, 0.95) that was previously observed in girls aged 13 to 15 was observed regardless of gender and age at 9 months. At 21 months, the program produced no significant effect ($p > .05$), suggesting that the program reduced the chance of a student reporting being a victim of bullying at school by 19% for the complete sample (non-stratified) only at 9 months.

Regarding the outcome “bullying practice” ([Table 2](#)), the results verified that the prevalence of reports increased with time

Table 1

Distribution of 5007 adolescents with linked data at the three data collection points by group (intervention and control) and sociodemographic data for the randomized controlled trial (RCT) of the #Tamojuntó program. Brazil, 2014–2015.

	Total (n = 5007)		Group				p
	N	%	Intervention (n = 2460)		Control (n = 2547)		
			N	%	N	%	
City							< 0.001
Distrito Federal	445	8.9	232	52.1	213	47.9	
Fortaleza	354	7.1	145	41.0	209	59.0	
Tubarão	261	5.2	124	47.5	137	52.5	
Florianópolis	694	13.9	295	42.5	399	57.5	
São Bernardo do Campo	718	14.3	368	51.2	350	48.6	
São Paulo	2535	50.6	1304	51.1	1244	48.8	
Gender							0.238
Boys	2459	49.1	1229	50.0	1230	48.3	
Girls	2548	50.9	1231	50.0	1317	51.7	
Age group							0.015
11–12	2812	56.2	1339	54.4	1473	57.8	
13–15	2195	43.8	1121	45.6	1074	42.2	
Grade							< 0.001
7th	715	14.3	301	12.2	414	16.2	
8th	4292	85.7	2159	87.8	2133	83.8	
SES^c							0.151
A	205	4.1	100	4.1	105	4.1	
B1	401	8.0	207	8.4	194	7.6	
B2	1651	33.0	814	33.1	837	32.9	
C1	1625	32.5	812	33.0	813	31.9	
C2	908	18.1	439	17.8	469	18.4	
DE	217	4.3	88	3.6	129	5.1	

regardless of age and gender; the prevalence was approximately 17% in both groups at the initial time point and increased to 25.4% and 23.6% for the intervention and control groups, respectively, by 21 months. No effect of the #Tamojuntó program was observed at the 9- or 21-month follow-up. Similar results were found in the stratified analysis; the prevalence of the practice of bullying was similar among the groups at certain time points, but in contrast to the receipt of bullying results, the practice of bullying was higher among boys than girls at all time points and age strata (p values varying from 0.020 to < 0.001). Notably, the prevalence of reports of the receipt of bullying was greater than the reports of practicing bullying in the total sample and stratified by age group and gender.

Table 3 presents the occurrences of the receipt and the practice of physical violence and the #Tamojuntó program's effect on these outcomes. Without considering age and gender, the number of reports of receiving physical violence remained relatively stable over time, with report prevalence of 8.3% and 6.5% in the intervention and control groups, respectively, followed by a small increase to 9.2% in the intervention group and 7.4% in the control group and ending with a decrease at 21 months, with a prevalence of 8.0% for students in the intervention group and 6.5% for students in the control group. No effects of the program were observed for this change in prevalence by time period or by group ($p > .05$).

The results of the stratified analyses by age group and gender indicated that the prevalence of reports of the receipt of physical violence was higher among boys than among girls, with little variation between the age groups. For example, in the intervention group aged 11–12 years, boys reported receiving more physical violence than girls did at the three time points ($p \leq .001$): baseline, 9-month follow-up, and 21-month follow-up. The highest prevalence was 12.6% among boys aged 11–12 years, whereas the lowest prevalence was 3.5% among girls aged 13–15 years. Following stratification, these differences did not significantly affect the results regarding the effectiveness of the program by time point or group.

Regarding the outcome of engaging in physical violence, analysis of all data indicated that the numbers of reports in the intervention and control groups were similar at baseline, with a prevalence in the range of 6.0% that reached 9.6% in the intervention group and 8.2% in the control group at 9 months and remained stable at 21 months.

Considering the practice of physical violence, the stratified analyses for gender and age group indicated a greater prevalence among boys than among girls. For example, 13.3% of the boys in the 13- to 15-year age group at 21 months reported engaging in physical violence versus 5.6% of the girls ($p < .001$).

The #Tamojuntó program appeared to not have an effect on being a victim of physical violence. No effect of the program was found on engaging in violence at the three time points when all data were considered as a whole or when the data were stratified by age group and gender ($p > .05$).

3.1. Attrition

As expected, students who were lost to both follow-ups showed a significantly higher prevalence of practicing both bullying and

Table 2
Comparison between groups and evaluation of the #Tamojoito program's effects on the distribution of suffering from and practicing bullying in the past month among students participating in the randomized controlled trial of the #Tamojoito program from 2014 to 2015 according to age group and gender.

Age group	Gender	Time												#Tamojoito Effect						
		Baseline				9 months				21 months				9 months		21 months				
		Intervention		Control		Intervention		Control		Intervention		Control		OR ^a	95% CI	p	OR ^a	95% CI	p	
Suffer Bullying	Total	N	209	29.4	636	25.6	653	32.4	208	32.6	544	30.9	531	28.9	0.81	[0.69; 0.95]	0.010	0.91	[0.77; 1.08]	0.285
		%	2.410		2.483		2.016		2.170		1.759		1.836							
	11–12	Male	194	32.1	164	25.0	171	31.9	170	29.0	128	29.6	139	27.5	0.81	[0.59; 1.10]	0.173	0.78	[0.7; 1.09]	0.148
		Female	605		655		536		587		433		506							
	13–15	Male	220	31.0	219	28.1	215	35.8	241	34.1	202	37.1	186	31.5	0.93	[0.71; 1.23]	0.605	1.13	[0.85; 1.51]	0.395
		Female	710		779		600		706		545		590							
Practice Bullying	Total	N	135	23.2	127	23.8	139	29.5	144	32.4	112	26.7	104	27.2	0.91	[0.64; 1.28]	0.575	1.00	[0.69; 1.45]	0.999
		%	1.60		1.26		1.28		1.53		1.02		1.28							
	11–12	Male	106	17.2	120	16.8	127	22.4	139	21.6	133	25.4	134	23.6	1.00	[0.83; 1.21]	0.964	1.06	[0.87; 1.28]	0.574
		Female	608		663		534		588		436		512							
	13-a 15	Male	100	14.1	98	12.5	119	19.8	131	18.3	116	21.5	119	20.3	0.95	[0.65; 1.35]	0.718	0.92	[0.63; 1.32]	0.608
		Female	711		784		601		707		546		586							
Total	N	123	21.7	133	24.9	125	26.8	124	27.9	122	29.1	119	30.9	1.11	[0.77; 1.60]	0.570	1.07	[0.74; 1.55]	0.726	
	%	1.49		1.57		1.53		1.50		1.49		1.46								

^a For the total sample, GEE analysis were adjusted for gender, age, SES, school, and city.

Table 3
Comparison between groups and evaluation of the #Tamojuntó program's effect on the distribution of students suffering from and practicing physical violence in the past month among students participating in the randomized controlled trial of the #Tamojuntó program from 2014 to 2015 according to age group and gender.

	Time																						
	Baseline				9 months				21 months				#Tamojuntó Effect										
	Age group	Gender	N	%	Intervention	Control	N	%	Intervention	Control	N	%	OR ^a	95% CI	P	OR ^a	95% CI	P					
Suffer Physical Violence	Total		197	8.3	161	2,486	6.5	184	9.2	159	2,154	7.4	141	8.0	119	6.5	0.98	[0.73; 1.31]	0.895	0.97	[0.71; 1.33]	0.875	
			2,384		59	602		522		387		511		435		39		0.87	[0.53; 1.42]	0.570	1.23	[0.73; 2.08]	0.443
		Male	73	12.1	59	660	8.9	59	11.3	56	587	9.5	55	12.6	39	7.6							
		Female	36	5.1	31	779	4.0	34	5.7	35	697	5.0	34	6.2	30	5.1							
		Male	49	8.6	53	531	10.0	54	11.6	47	443	10.6	30	7.1	34	8.8							
		Female	30	7.7	18	507	3.5	37	9.1	21	427	4.9	22	6.1	16	4.5							
Practice Physical Violence	Total		161	6.8	157	2,476	6.3	191	9.6	177	2,169	8.2	165	9.4	145	7.9	1.10	[0.82; 1.46]	0.535	1.12	[0.83; 1.52]	0.457	
			2,383		60	662		528		34		436		33		50		1.19	[0.72; 1.99]	0.498	1.49	[0.87; 2.53]	0.144
		Male	47	7.8	57	662	8.6	57	10.8	59	588	10.0	53	12.8	50	9.8							
		Female	26	3.7	20	772	2.6	37	6.2	34	706	4.8	33	6.1	36	6.1							
		Male	58	10.1	60	527	11.4	60	12.8	59	444	13.3	56	13.3	47	12.3							
		Female	30	6.0	20	515	3.9	37	9.3	25	432	5.8	20	5.6	12	3.4							

^a For the total sample, GEE analysis were adjusted for gender, age, SES, school, and city.

physical aggression at the baseline than did students who were involved in at least one follow-up session. For example, although the prevalence of practicing bullying was 17.0% among the students whose data were linked over time, 21.0% of the students whose data were not linked over time admitted to bullying ($p = .001$). The prevalence of engaging in physical violence among the retained students was 6.5%, whereas the rate for students lost to follow-up was 9.4% ($p < .001$). Additionally, a significant difference was found when attrition was compared between the groups (intervention and control), with more losses among students from the intervention group than from the control group (56.6% vs. 43.4%). When considering age, students between the ages of 13 and 15 years had less linked data than did younger students aged between 11 and 12 years old. However, no difference was observed when comparing the prevalence of being a victim of bullying or physical violence between linked and non-linked students. Additionally, no gender difference was observed.

4. Discussion

The present study evaluated the effect of the #Tamojuntó prevention program on the number of reports of Brazilian students receiving or engaging in bullying and physical violence. This is one of the more comprehensive basic studies about peer aggression in schools in Brazil. We found a comparable rate of experiences with violence as in the United States (Nansel et al., 2001). The results indicate a short-term protective effect on the receipt of bullying at the 9-month follow-up; students in the intervention group were 30% less likely to report receiving bullying than students in the control group were 9 months after the intervention. After stratifying the analyses by gender and age group, the same effect was observed for girls in the 13- to 15-year-old age group at 9 months. At 21 months, the effect was not sustained for any stratum. No effect was observed for physical violence practiced or received in the global or stratified groups.

The effect on the receipt of bullying is of great importance to the health of the student due to the consequences of this type of violence in both adolescence and adulthood (Tofi et al., 2011), such as stress, decreased self-esteem, anxiety, depression, decreased school performance and even suicide (Boynton-Jarrett, Ryan, Berkman, & Wright, 2008; Jankauskiene et al., 2008). Additionally, school violence events have been identified as factors that decrease learning (Lazear, 2001), affect the attendance of the student and his/her completion of school, and hinder the work of the educator (Organização das Nações Unidas para Educação, Ciência e Cultura [UNESCO], 2000). Thus, implementing school programs that reduce these events and addressing related risk behaviors, such as drug use, aggression and violence, delinquency and risky sexual behavior, is important.

The prevalence of receiving bullying was higher than the prevalence of practicing such violence, which corroborated with the results of studies conducted in Brazilian cities (Brito & Oliveira, 2013; Malta et al. 2010; Rech, Halpern, Tedesco, & Santos, 2012) and the United States (Botvin et al., 2006). Potential explanations for these differences are that the perpetrators are afraid to report a socially intolerable act or that bullies are students in other series not examined by the study sample design. Nevertheless, the perception of being a victim is different from the perception of being an aggressor (i.e., adolescents who attack their peers may not perceive their offensive behavior, although the aggression is clearly noticed by the victims).

Regarding the analyses stratified by gender, there was a higher prevalence among boys in practicing bullying, receiving physical violence and engaging in physical violence; this result was consistent with other studies (Guimarães & Pasian, 2006; Malta et al., 2010, 2014). This difference was explained by Liu and Kaplan (2004) in a cohort study that examined associations between gender and a history of aggressiveness with a tendency toward aggression in early adulthood among Americans. The results indicated that the more aggressive behavior of men than of women occurred due to differences in the processes of socialization, the expectations regarding the role of a man and the structures of the genders. In this context, men tend to internalize aggressive behavior and assume that such internalizing is effective. It is important to mention that the prevalence of being involved in episodes of bullying and physical violence might change according to gender because some authors have found that girls are more involved in episodes of bullying than boys (Cecen-Celik & Keith, 2016). In contrast, we found that boys are more involved in episodes of physical violence. For the same outcomes, stratifying the analyses by age group determined a greater prevalence in the 13- to 15-year-old age group than in the 11- to 12-year-old age group. This difference may be due to feelings of greater autonomy and safety in older adolescents in reporting such behaviors or an actual greater occurrence of these behaviors.

Botvin et al. (2006) analyzed the effectiveness of the alcohol and drug prevention program *Life Skills Training* on violence among American adolescents. Consistent with that study, the current study confirmed the effect of the program as a whole and for girls aged 13–15 years for the outcome of receipt of bullying at 9 months of follow-up, thereby reinforcing the hypothesis that programs that focus on preventing alcohol and other drug use also affect aspects of violence. Additionally, Faggiano et al. (2010) evaluated the effect of the *Unplugged* program on drug use by adolescents 12–14 years of age in European countries in their 18-month randomized controlled trial and observed evidence of a temporary effect on the protective influence with regard to tobacco use. However, although the effect was present in the first follow-up, it was lost at 18 months. In the present study, the anti-bullying effect detectable at 9 months post-intervention was not supported at the 21-month follow-up, suggesting that this type of program had only short-term effects and must be improved to create lasting effects.

Although studies have shown the effects of school programs on the prevention of violence (Swaim & Kelly, 2008), the use of alcohol and other drugs and the practice of physical violence among adolescents (Botvin et al., 2006), the present study observed no effect of the #Tamojuntó program for the variable of physical violence independent of the stratifications by age group or gender or the follow-up time. This difference in the results compared with the results of the two previously mentioned studies may be due to variations in the design of the program. In Swaim and Kelly's (2008) study, the target population was adolescents from small towns in the United States, and the intervention used a slightly different approach from #Tamojuntó. In addition to focusing on a one-week training in violence prevention issues followed by replication with colleagues, #Tamojuntó aspired to create anti-violence campaigns

in the school. Botvin et al.'s (2006) study on the effect of the *Life Skills Training* program on violence and delinquency among 6th-graders in New York schools had a different study design from that of the study on #Tamojuntó because the prior study was conducted in a single city and the current study approached students from 6 cities with quite different socioeconomic profiles. Additionally, although the components covered in *Life Skills Training* are nearly identical to #Tamojuntó, including issues related to autonomy, conflict resolution, decision-making, communication and relationships, the first program includes more classes than #Tamojuntó does. Thus, factors that influence physical violence can be reinforced in *Life Skills Training*.

The finding of changes in the receipt of bullying but not in the receipt of physical violence may have been obtained because adolescents who practice either bullying or physical violence have different profiles, so the program may affect them differently. Perhaps students with profiles of physical violence involve a psychopathology that would not necessarily be reduced by a universal program in the classroom but may require a more selective or clinical intervention.

Some aspects of the implementation of the #Tamojuntó program must be cited as possible reasons for the lack of many positive changes in school violence. According to Medeiros et al. (2016), who presented a study about the implementation of *Unplugged* in Brazil, the lack of extra time for teachers to prepare the lessons and to continue their regular activities and the short amount of time to apply every activity of each lesson in one class hour might have compromised the fidelity of the program. Furthermore, it is important to note that the poor literacy of students (Organization for Economic Cooperation and Development [OECD], 2016) and the low-qualified teachers (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira [INEP], 2009) compromise the quality of Brazilian public schools and may be associated with a deficiency in the understanding of the activities (Sanchez et al., 2017).

Although innovative, the present study has limitations that must be mentioned. The primary limitation was student absences from class, which compromised the collection of data at the three time points and affected the students' exposure to the program, indicating a possible selection bias. A Brazilian Institute of Geography and Statistics (2012) study indicated that approximately 20% of students were absent each day from public schools in this country, which explained our initial lack of potential recruits and actual participants. Another limitation is that because this study used an individual questionnaire as the instrument, the answers may be subject to information bias due to incorrect interpretation, intention to report the truth or learning the questions through repetition during the three monitoring time points. It is important to mention that there was no measure to evaluate whether the teachers learned what was required; consequently, the intervention may have differed from school to school, which may indicate an implementation bias.

From a theoretical-conceptual perspective, the #Tamojuntó program is considered effective in reducing violence (Fagan & Catalano, 2012) once it focuses on the improvement of social and emotional competencies, including the control of feelings, communication, conflict resolution and decision-making (Fagan & Catalano, 2012) through the use of cognitive and behavioral methods that promote openness to discussions, role playing (Botvin et al., 2006; Kreeft et al., 2009) and interactions with older students who already possess these skills (Swaim & Kelly, 2008).

5. Conclusion

The results presented here suggest that #Tamojuntó may be effective for the prevention of short-term bullying victimization of students and that girls aged 13–15 years appear to be the greatest beneficiaries. However, the booster classes must be enhanced and tested to extend the duration of the effects and verify the possible sustainability of the program over months and years. We suggest that further studies on the practice of violence should be conducted with more detailed instruments, which would allow frequency gradient analysis of the occurrence of violent events to enhance our understanding of the effects of the #Tamojuntó program on school violence. This study was the first analytical study of the program to address this outcome.

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