



Impact of bullying victimization on suicide and negative health behaviors among adolescents in Latin America

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Suggested citation

Romo ML, Kelvin EA. Impact of bullying victimization on suicide and negative health behaviors among adolescents in Latin America. *Rev Panam Salud Publica*. 2016;40(5):347–55.

ABSTRACT

Objective. To compare the prevalence of bullying victimization, suicidal ideation, suicidal attempts, and negative health behaviors (current tobacco use, recent heavy alcohol use, truancy, involvement in physical fighting, and unprotected sexual intercourse) in five different Latin American countries and determine the association of bullying victimization with these outcomes, exploring both bullying type and frequency.

Methods. Study data were from Global School-based Student Health Surveys from Bolivia, Costa Rica, Honduras, Peru, and Uruguay, which covered nationally representative samples of school-going adolescents. The surveys used a two-stage clustered sample design, sampling schools and then classrooms. Logistic regression models were run to determine the statistical significance of associations with bullying.

Results. Among the 14 560 school-going adolescents included in this study, the prevalence of any bullying victimization in the past 30 days was 37.8%. Bullying victimization was associated with greater odds of suicidal ideation with planning (adjusted odds ratio (AOR): 3.12; $P < 0.0001$) and at least one suicide attempt (AOR: 3.07; $P < 0.0001$). An increasing exposure-response effect of increasing days of bullying victimization on suicide outcomes was also observed. Bullying victimization was associated with higher odds of current tobacco use (AOR: 2.14; $P < 0.0001$); truancy (AOR: 1.76; $P < 0.0001$); physical fighting (AOR: 2.40; $P < 0.0001$); and unprotected sexual intercourse (AOR: 1.77; $P < 0.0001$).

Conclusions. Although the prevalence of bullying victimization varied by country, its association with suicidal ideation and behavior and negative health behaviors remained relatively consistent. Addressing bullying needs to be made a priority in Latin America, and an integrated approach that also includes mental and physical health promotion is needed.

Key words

Bullying; adolescent; suicide; tobacco; alcohol drinking; aggression; sexual behavior; school health; Latin America.

Adolescent victims of bullying are at increased risk for mental health problems, including suicidal ideation and behavior, which can persist into

adulthood (1). In addition, negative health behaviors, such as substance use, may be more common among bullying victims (2–4). Large regional studies looking at both Latin America and other low- and middle-income countries worldwide show wide variation in the prevalence of bullying victimization (5, 6). For example, in a survey from the

United Nations Educational, Scientific and Cultural Organization (UNESCO) of 91 223 sixth graders from 2 969 schools in 16 Latin American countries, the average prevalence of 30-day recall of bullying victimization was 48.7% for all 16 countries combined, but the country-specific prevalence ranged from 13.2% to 63.2% (5).

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Distress from bullying victimization can be turned inward, manifesting as internalizing behaviors such as suicidal ideation, or outward, manifesting as externalizing behaviors such as attempting suicide or other negative health behaviors such as physical aggression (7). The relationship between bullying victimization and these behaviors, particularly in terms of causality, is highly complex (8). While most of the data on these associations with bullying victimization come from outside Latin America (1–4, 9–12), there does seem to be some consistency globally (6). Nevertheless, Latin America has some potentially context-specific factors, such as deeply rooted gender role norms, religious beliefs, and cultural attitudes, which may influence these relationships (13–15). Understanding both the morbidity and associated negative health behaviors of victims of bullying in Latin America will help provide a region-specific evidence base for designing and planning public health interventions.

The objectives of this study were to 1) compare the prevalence of bullying victimization, suicidal ideation, suicide attempts, and negative health behaviors (current tobacco use, recent heavy alcohol use, truancy, involvement in physical fighting, and unprotected sexual intercourse) in five different Latin American countries and 2) determine the association of bullying victimization with these outcomes, exploring both bullying type and frequency.

MATERIALS AND METHODS

Sample

The Global School-based Student Health Survey (GSHS) is a representative cross-sectional survey conducted among school-going adolescents, developed by the World Health Organization (WHO) in collaboration with the United Nations Children's Fund (UNICEF), UNESCO, and the Joint United Nations Programme on HIV/AIDS (UNAIDS), with financial and technical assistance from the U.S. Centers for Disease Control and Prevention (CDC) (16). For the analysis reported here, data were obtained from five Spanish-speaking Central and South American countries. Inclusion criteria for the countries were 1) having comparable data for variables of interest and 2) having full data sets publically available at the time of the analysis (July 2015). The

countries (and survey years) included in the study were: Bolivia (2012), Costa Rica (2009), Honduras (2012), Peru (2010), and Uruguay (2012). The overall response rates (school response multiplied by student response) were 72% for Costa Rica, 77% for Uruguay, 79% for Honduras, 85% for Peru, and 88% for Bolivia.

The GSHS used a two-stage clustered sample design. Schools were eligible for the study if they had students in grades that included 13- to 15-year-olds, and were selected with probability proportional to their student body size. Classrooms were then selected randomly from within each selected school, and the students in the selected classrooms invited to participate. The survey was self-administered in Spanish, and anonymous. Students entered their answers on computer-scannable answer sheets, which were sent to the CDC for scanning, processing, and data cleaning. Local ministries of health maintained ethical oversight over their respective country's survey.

Measures

For this analysis, the research team used four suicide outcomes (suicidal ideation without planning, suicidal ideation with planning, at least one suicide attempt, and more than one suicide attempt) and five negative health behaviors (current tobacco use, recent heavy alcohol use, involvement in physical fighting, truancy, and unprotected sexual intercourse) (Table 1). The independent variables of interest were 1) any bullying victimization, 2) type of bullying victimization, and 3) frequency of bullying victimization (Table 1). Bullying was defined in the survey as "when a student or group of students say or do bad and unpleasant things to another student" or "when a student is teased a lot in an unpleasant way or when a student is left out of things on purpose." It was clarified that bullying was not "when two students of about the same strength or power argue or fight" or "when teasing is done in a friendly and fun way." Demographic variables included age (≤ 12 years, 13 years, 14 years, 15 years, and ≥ 16 years); sex; and country of residence. Age and sex were self-reported by students; country of residence was determined based on where the students took the survey.

Statistical analysis

Weighted frequencies of all variables were run and Rao-Scott chi-square tests were used to determine the statistical significance of differences by country of residence in the distribution of bullying victimization, suicidal ideation and attempt, negative health behaviors, and demographic variables. Multivariable logistic regression models adjusted for age, sex, and country of residence were also run to evaluate the effect of all bullying variables, using separate models for each suicide and negative health behavior variable. To determine if country of residence was an effect measure modifier, an interaction term was added to each of the adjusted logistic regression models (country of residence multiplied by bullying victimization). If statistically significant at a two-sided alpha of < 0.10 , stratified analysis was conducted. Given the occurrence of missing data, which were assumed to be missing at random, a multiple imputation procedure (fully conditional specification) was used to examine the effect of bias (17, 18). In addition to using all variables in the models to impute data, survey weights and a combined stratum and cluster variable were included to account for the complex sample design. Five imputations were run to allow for $> 96\%$ efficiency. All multivariable logistic regression models were then re-run using the imputed data, adjusting for the complex sample design, as done in the complete case analysis.

For all analyses, the significance level was set at two-sided alpha of 0.05. All analyses were performed using SAS 9.4 (SAS Institute, Cary, North Carolina, United States), adjusted for the selection probabilities (related to the complex sample design), and weighted to the sex and grade distribution of the school-going adolescent populations of their respective countries. Weights were calculated using the inverse of the probability of selecting each school and classroom and adjusted for nonresponse at the student and school levels, with post-stratification adjustment by sex within grade.

RESULTS

Overall, 14 560 school-going adolescents were included in the study, representing the school-going adolescent populations of Bolivia, Costa Rica, Honduras, Peru, and

TABLE 1. Definitions of dependent and independent variables of interest in study on impact of bullying victimization on suicide and negative health behaviors among adolescents in Latin America^a

Variable	Survey questions	Variable categories based on responses
Suicidal ideation without planning	“During the past 12 months, did you ever seriously consider attempting suicide?” “During the past 12 months did you make a plan about how you would attempt suicide?”	– Yes (a response of “Yes” to the first question and a response of “No” to the second question) – No (a response of “No” to the first question)
Suicidal ideation with planning	“During the past 12 months, did you ever seriously consider attempting suicide?” “During the past 12 months did you make a plan about how you would attempt suicide?”	– Yes (a response of “Yes” to both questions) – No (a response of “No” to either question)
At least one suicide attempt	“During the past 12 months, how many times did you actually attempt suicide?”	– Yes (a response of “1 time,” “2 or 3 times,” “4 or 5 times,” or “6 or more times”) – No (a response of “0 times”)
More than one suicide attempt	“During the past 12 months, how many times did you actually attempt suicide?”	– Yes (a response of “2 or 3 times,” “4 or 5 times,” or “6 or more times”) – No (a response of “0 times” or “1 time”)
Current tobacco use	“During the past 30 days, on how many days did you smoke cigarettes?” “During the past 30 days on how many days did you use any tobacco products, other than cigarettes, such as [country-specific examples ^b]?”	– Yes (a response of “1 or 2 days,” “3 to 5 days,” “6 to 9 days,” “10 to 19 days,” “20 to 29 days,” or “all 30 days” to either question) – No (a response of “0 days” to both questions)
Recent heavy alcohol use	“During the past 30 days, on the days you drank alcohol, how many drinks ^c did you usually drink per day?”	– Yes (a response of “5 or more drinks” (i.e., the highest number)) – No (a response of “I did not drink alcohol in the past 30 days,” “less than one drink,” “1 drink,” “2 drinks,” “3 drinks,” or “4 drinks”)
Involvement in physical fighting	“During the past 12 months, how many times were you in a physical fight?”	– Yes (a response of “1 time,” “2 or 3 times,” “4 or 5 times,” “6 or 7 times,” “8 or 9 times,” “10 or 11 times,” or “12 or more times”) – No (a response of “0 times”)
Truancy	“During the past 30 days, on how many days did you miss classes or school without permission?”	– Yes (a response of “1 or 2 days,” “3 to 5 days,” “6 to 9 days,” or “10 or more days”) – No (a response of “0 days”)
Unprotected sexual intercourse	“The last time you had sexual intercourse, did you or your partner use a condom?”	– Yes (response of “No” to question) – No (response of “Yes” or “I have never had sexual intercourse” to question)
Any bullying victimization	“During the past 30 days, how were you bullied most often?” “During the past 30 days, how many days were you bullied?”	– Yes (any responses other than “I was not bullied during the past 30 days” for the first question and any responses other than “0 days” for the second question) – No (a response of “I was not bullied during the past 30 days” for the first question and a response of “0 days” for the second question)
Type of bullying victimization	“During the past 30 days, how were you bullied most often?”	– Physical bullying victimization (“I was hit, kicked, pushed, shoved around, or locked indoors”) – Nonphysical bullying victimization (“I was made fun of because of my race, nationality, or color,” “I was made fun of because of my religion,” “I was made fun of with sexual jokes, comments, or gestures,” “I was left out of activity on purpose or completely ignored,” or “I was made fun of because of how my body or face looks”) – Unspecified bullying victimization (“I was bullied in some other way”)
Frequency of bullying victimization	“During the past 30 days, how many days were you bullied?”	– 0 days (a response of “0 days”) – 1 or 2 days (a response of “1 or 2 days”) – 3 to 9 days (a response of “3 to 5 days” or “6 to 9 days”) – 10 or more days (a response of “10 to 19 days,” “20 to 29 days,” or “all 30 days”)

Source: Prepared by the authors using information from the GSHS questionnaires (<http://www.cdc.gov/gshs/>).

^a Bolivia, Costa Rica, Honduras, Peru, and Uruguay.

^b Local terms for cigars, pipes, water pipes, and chewing tobacco.

^c Defined as at least a full glass of wine, a bottle or can of beer, a small glass of liquor, or a mixed drink.

Uruguay. The majority of students (78.3%) were between 13 and 15 years of age, and there was a similar proportion of males and females. Overall, approximately one-third (37.8%) of students reported being bullied in the past 30 days. There were significant differences in bullying victimization by country of residence, with the highest prevalence in Peru (47.8%) and the lowest prevalence in Uruguay (19.3%). Physical bullying victimization was most

prevalent in Peru (4.4%) and least prevalent in Uruguay (0.8%). With regard to frequency, being bullied 10 or more days was most prevalent in Peru (3.9%) and least prevalent in Costa Rica (1.8%) (Table 2).

There were also significant differences in both suicidal ideation and behavior and negative health behaviors by country of residence. Suicidal ideation without planning was most prevalent in Peru (8.4%) and least prevalent in Uruguay (5.4%),

whereas suicidal ideation with planning was most prevalent in Honduras (14.0%) and least prevalent in Uruguay (7.2%). Bolivia had the highest proportion of students who reported at least one suicide attempt (20.9%) and both Bolivia and Honduras had the highest proportion of students reporting multiple suicide attempts (7.3% and 7.4% respectively). Costa Rica had the lowest prevalence of students reporting at least one suicide

TABLE 2. Frequencies of demographics, bullying victimization, suicide outcomes, and negative health behaviors by country of residence

Variable	Total (<i>n</i> = 14 560) No. (weighted %)	Bolivia (<i>n</i> = 3 696) No. (weighted %)	Costa Rica (<i>n</i> = 2 679) No. (weighted %)	Honduras (<i>n</i> = 1 779) No. (weighted %)	Peru (<i>n</i> = 2 882) No. (weighted %)	Uruguay (<i>n</i> = 3 524) No. (weighted %)	<i>P</i> ^a
Sex	(<i>n</i> = 14 304)	(<i>n</i> = 3 535)	(<i>n</i> = 2 669)	(<i>n</i> = 1 748)	(<i>n</i> = 2 864)	(<i>n</i> = 3 488)	0.47
Female	7 363 (50.1)	1 743 (49.0)	1 382 (49.6)	909 (53.1)	1 462 (49.4)	1 867 (54.0)	
Male	6 941 (49.9)	1 792 (51.0)	1 287 (50.4)	839 (46.9)	1 402 (50.6)	1 621 (46.0)	
Age	(<i>n</i> = 14 329)	(<i>n</i> = 3 544)	(<i>n</i> = 2 667)	(<i>n</i> = 1 763)	(<i>n</i> = 2 867)	(<i>n</i> = 3 488)	< 0.0001
≤ 12 years	572 (4.9)	173 (4.8)	50 (1.7)	268 (16.5)	56 (2.0)	25 (0.7)	
13 years	3 109 (21.0)	697 (18.3)	755 (26.6)	429 (25.5)	513 (19.6)	715 (22.1)	
14 years	4 143 (28.7)	1 001 (27.3)	754 (28.3)	467 (25.8)	848 (30.3)	1 073 (30.1)	
15 years	4 074 (28.6)	980 (29.0)	713 (27.0)	355 (18.8)	956 (31.9)	1 070 (30.2)	
≥ 16 years	2 431 (16.8)	693 (20.6)	395 (16.5)	244 (13.3)	494 (16.2)	605 (17.0)	
Bullying victimization	(<i>n</i> = 13 881)	(<i>n</i> = 3 391)	(<i>n</i> = 2 606)	(<i>n</i> = 1 689)	(<i>n</i> = 2 779)	(<i>n</i> = 3 416)	< 0.0001
None	9 762 (62.2)	2 300 (68.4)	2 083 (80.5)	1 171 (68.4)	1 454 (52.2)	2 754 (80.7)	
Any	4 119 (37.8)	1 091 (31.6)	523 (19.5)	518 (31.6)	1 325 (47.8)	662 (19.3)	
Most common bullying victimization type in past 30 days	(<i>n</i> = 13 278)	(<i>n</i> = 3 141)	(<i>n</i> = 2 539)	(<i>n</i> = 1 610)	(<i>n</i> = 2 677)	(<i>n</i> = 3 311)	< 0.0001
Physical	327 (3.4)	112 (3.4)	36 (1.4)	37 (2.2)	116 (4.4)	26 (0.8)	
Nonphysical	1 901 (18.2)	422 (13.4)	259 (9.8)	246 (15.8)	632 (23.5)	342 (10.4)	
Unspecified	1 288 (13.3)	307 (9.6)	161 (6.1)	156 (10.3)	475 (17.9)	189 (5.6)	
Bullying victimization frequency in past 30 days	(<i>n</i> = 13 299)	(<i>n</i> = 3 154)	(<i>n</i> = 2 541)	(<i>n</i> = 1 610)	(<i>n</i> = 2 677)	(<i>n</i> = 3 317)	< 0.0001
1 or 2 days	2 419 (24.4)	576 (17.8)	293 (11.2)	281 (17.9)	885 (33.2)	384 (11.5)	
3–9 days	760 (7.3)	187 (6.0)	116 (4.5)	112 (7.3)	232 (8.7)	113 (3.4)	
10 or more days	358 (3.2)	91 (2.7)	49 (1.8)	46 (3.0)	106 (3.9)	66 (2.0)	
Suicidal ideation							
None	(<i>n</i> = 14 350)	(<i>n</i> = 3 625)	(<i>n</i> = 2 652)	(<i>n</i> = 1 734)	(<i>n</i> = 2 859)	(<i>n</i> = 3 480)	< 0.0001
Without planning	12 038 (81.7)	2 939 (81.8)	2 360 (89.2)	1 406 (80.5)	2 275 (80.0)	3 058 (87.7)	
With planning	(<i>n</i> = 12 910)	(<i>n</i> = 3 167)	(<i>n</i> = 2 512)	(<i>n</i> = 1 508)	(<i>n</i> = 2 489)	(<i>n</i> = 3 234)	0.002
Without planning	872 (7.4)	228 (6.6)	152 (5.9)	102 (6.8)	214 (8.4)	176 (5.4)	
With planning	(<i>n</i> = 13 765)	(<i>n</i> = 3 463)	(<i>n</i> = 2 601)	(<i>n</i> = 1 635)	(<i>n</i> = 2 782)	(<i>n</i> = 3 284)	< 0.0001
With planning	1 400 (12.1)	445 (12.8)	137 (5.2)	219 (14.0)	366 (12.8)	233 (7.2)	
Suicidal behavior							
None	(<i>n</i> = 14 419)	(<i>n</i> = 3 631)	(<i>n</i> = 2 665)	(<i>n</i> = 1 769)	(<i>n</i> = 2 853)	(<i>n</i> = 3 501)	< 0.0001
At least one suicide attempt	12 268 (82.9)	2 854 (79.1)	2 437 (91.6)	1 472 (82.7)	2 353 (82.6)	3 152 (89.9)	
More than one suicide attempts	(<i>n</i> = 14 419)	(<i>n</i> = 3 631)	(<i>n</i> = 2 665)	(<i>n</i> = 1 769)	(<i>n</i> = 2 853)	(<i>n</i> = 3 501)	< 0.0001
More than one suicide attempts	754 (6.2)	265 (7.3)	69 (2.5)	122 (7.4)	183 (6.3)	115 (3.4)	
Current tobacco use	(<i>n</i> = 14 349)	(<i>n</i> = 3 622)	(<i>n</i> = 2 662)	(<i>n</i> = 1 751)	(<i>n</i> = 2 852)	(<i>n</i> = 3 462)	< 0.0001
Recent heavy alcohol use	2 193 (17.3)	600 (17.2)	324 (12.8)	241 (13.7)	563 (19.7)	465 (13.6)	
Recent heavy alcohol use	(<i>n</i> = 14 272)	(<i>n</i> = 3 587)	(<i>n</i> = 2 646)	(<i>n</i> = 1 734)	(<i>n</i> = 2 847)	(<i>n</i> = 3 458)	< 0.0001
Recent heavy alcohol use	803 (3.9)	105 (3.0)	179 (6.9)	54 (3.1)	97 (3.4)	368 (10.7)	
Involvement in physical fighting	(<i>n</i> = 14 508)	(<i>n</i> = 3 689)	(<i>n</i> = 2 674)	(<i>n</i> = 1 744)	(<i>n</i> = 2 881)	(<i>n</i> = 3 520)	< 0.0001
Truancy	4 291 (33.2)	1 219 (32.9)	573 (21.8)	478 (28.1)	1 066 (37.8)	955 (27.0)	
Truancy	(<i>n</i> = 14 384)	(<i>n</i> = 3 666)	(<i>n</i> = 2 647)	(<i>n</i> = 1 740)	(<i>n</i> = 2 859)	(<i>n</i> = 3 472)	< 0.0001
Truancy	4 645 (34.2)	1 220 (33.4)	971 (37.6)	473 (27.3)	1 053 (36.9)	928 (26.7)	
Unprotected sexual intercourse	(<i>n</i> = 14 076)	(<i>n</i> = 3 527)	(<i>n</i> = 2 591)	(<i>n</i> = 1 699)	(<i>n</i> = 2 838)	(<i>n</i> = 3 421)	0.31
Unprotected sexual intercourse	934 (6.7)	277 (7.7)	182 (7.8)	107 (6.1)	181 (6.4)	187 (5.4)	

Source: Prepared by the authors based on the study results.

^a Rao-Scott chi-square tests.

attempt (8.4%) and multiple attempts (2.5%). Current tobacco use was highest in Peru (19.7%) and lowest in Costa Rica (12.8%). Recent heavy alcohol use was highest in Uruguay (10.7%) and lowest in Bolivia (3.0%). Involvement in at least one

physical fight in the last year was most common in Peru (37.8%) and least common in Costa Rica (21.8%). Truancy in the past 30 days was most common in Costa Rica (37.6%) and least common in Uruguay (26.7%). There were no significant

differences by country of residence in the prevalence of unprotected intercourse at last sexual encounter, which had an overall prevalence of 6.7% (Table 2).

In logistic regression models adjusted for age, sex, and country of residence,

TABLE 3. Adjusted logistic regression models^a for the association between bullying victimization and suicide outcomes in Latin America^b

Variable	Suicidal ideation without planning		Suicidal ideation with planning		At least one suicide attempt		Multiple suicide attempts	
	AOR ^c (95% CI ^d)	P	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P
Any bullying victimization in past 30 days								
	(n = 12 062)		(n = 12 850)		(n = 13 438)		(n = 13 438)	
No	1.00		1.00		1.00		1.00	
Yes	2.51 (2.06, 3.07)	< 0.0001	3.12 (2.70, 3.59)	< 0.0001	3.07 (2.71, 3.48)	< 0.0001	4.03 (3.28, 4.96)	< 0.0001
Bullying victimization frequency in past 30 days								
	(n = 11 619)		(n = 12 372)		(n = 12 905)		(n = 12 905)	
None	1.00		1.00		1.00		1.00	
1 or 2 days	2.20 (1.72, 2.82)	< 0.0001	2.58 (2.15, 3.11)	< 0.0001	2.76 (2.37, 3.22)	< 0.0001	2.93 (2.33, 3.69)	< 0.0001
3–9 days	3.18 (2.39, 4.23)	< 0.0001	4.34 (3.43, 5.49)	< 0.0001	4.09 (3.33, 5.02)	< 0.0001	6.85 (5.20, 9.02)	< 0.0001
10 or more days	4.58 (2.84, 7.38)	< 0.0001	6.76 (5.05, 9.05)	< 0.0001	5.02 (3.64, 6.93)	< 0.0001	8.62 (5.95, 12.49)	< 0.0001
Most common type of bullying victimization type in past 30 days								
	(n = 11 606)		(n = 12 359)		(n = 12 884)		(n = 12 884)	
No bullying	1.00		1.00		1.00		1.00	
Physical	2.36 (1.31, 4.28)	0.004	3.40 (2.19, 5.27)	< 0.0001	3.51 (2.63, 4.69)	< 0.0001	5.16 (3.17, 8.38)	< 0.0001
Nonphysical	2.78 (2.24, 3.45)	< 0.0001	3.61 (3.04, 4.29)	< 0.0001	3.49 (2.98, 4.07)	< 0.0001	4.83 (3.78, 6.16)	< 0.0001
Unspecified	2.21 (1.61, 3.05)	< 0.0001	2.66 (2.17, 3.26)	< 0.0001	2.73 (2.34, 3.20)	< 0.0001	3.10 (2.34, 4.11)	< 0.0001

Source: Prepared by the authors based on the study results.

^a Adjusted for age, sex, and country of residence.

^b Bolivia, Costa Rica, Honduras, Peru, and Uruguay.

^c AOR: adjusted odds ratio.

^d CI: confidence interval.

any bullying victimization in the past 30 days was significantly associated with suicidal ideation without planning (adjusted odds ratio (AOR): 2.51), suicidal ideation with planning (AOR: 3.12), at least one suicide attempt (AOR: 3.07), and multiple suicide attempts (AOR: 4.03) (Table 3). To determine if country of residence was an effect measure modifier, logistic regression models were re-run with interactions terms for country of residence multiplied by any bullying victimization, but these were not significant for any outcomes (data not shown).

Overall, all bullying types were associated with similarly increased odds for all measures of suicidal ideation and behavior in logistic regression models adjusted for age, sex, and country of residence. Compared with no bullying victimization, reporting physical, nonphysical, and unspecified bullying victimization was associated with significantly greater odds of suicidal ideation without planning (AOR: 2.36, 2.78, and 2.21 respectively); suicidal ideation with planning (AOR: 3.40, 3.61, and 2.66 respectively); at least one suicide attempt (AOR: 3.51, 3.49, and 2.73 respectively); and multiple suicide attempts (AOR: 5.16, 4.83, and 3.10 respectively). Bullying victimization frequency

demonstrated an increasing exposure–response effect, with greater number of days of victimization associated with greater odds of suicidal ideation and behavior. Compared with no bullying victimization, reporting bullying victimization of 1 or 2 days was associated with significantly greater odds of suicidal ideation without planning (AOR: 2.20), suicidal ideation with planning (AOR: 2.58), at least one suicide attempt (AOR 2.76), and multiple suicide attempts (AOR: 2.93). A frequency of 3–9 days was associated with significantly greater odds of suicidal ideation without planning (AOR: 3.18), suicidal ideation with planning (AOR: 4.34), at least one suicide attempt (AOR: 4.09), and multiple suicide attempts (AOR: 6.85). Finally, bullying victimization of 10 days or more in the past month was associated with significantly greater odds of suicidal ideation without planning (AOR: 4.58), suicidal ideation with planning (AOR: 6.76), at least one suicide attempt (AOR: 5.02), and multiple suicide attempts (AOR: 8.62) (Table 3).

It was also observed that any bullying victimization was associated with significantly greater odds of being a current smoker (AOR: 2.14), truancy (AOR: 1.76), physical fighting (AOR: 2.40), and

unprotected sexual intercourse (AOR: 1.77). The association between bullying victimization and recent heavy alcohol use was of borderline statistical significance (AOR: 1.30; *P* = 0.06) (Table 4). To determine if country of residence was an effect measure modifier, logistic regression models were re-run for all negative health behaviors with interactions terms for country of residence multiplied by any bullying victimization in the past 30 days, but these were not significant for truancy, physical fighting, and unprotected sexual intercourse (data not shown). However, they were significant for current tobacco use (overall *P* = 0.03) and recent heavy alcohol use (overall *P* = 0.02). In analyses stratified by country of residence, any bullying victimization was significantly associated with being a current tobacco user in all countries, but there were some differences in effect, with the greatest odds in Honduras (AOR: 3.43) and lowest odds in Costa Rica (AOR: 1.77). Bullying victimization was only significantly associated with increased odds of recent heavy alcohol use in Costa Rica (AOR: 1.61, *P* = 0.03) (Table 5).

When looking at the frequency of bullying victimization, there was some evidence of an increasing exposure–response effect for being a current tobacco

TABLE 4. Adjusted logistic regression models^a for the association between bullying victimization and negative health behaviors in Latin America^b

Variable	Current tobacco user		Recent heavy alcohol use		Truancy		Involvement in physical fighting		Unprotected sexual intercourse	
	AOR ^c (95% CI) ^d	P	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P
Any bullying victimization in past 30 days										
	(n = 13 376)		(n = 13 313)		(n = 13 397)		(n = 13 505)		(n = 13 146)	
No	1.00		1.00		1.00		1.00		1.00	
Yes	2.14 (1.88, 2.44)	< 0.0001	1.30 (0.99, 1.69)	0.06	1.76 (1.59, 1.95)	< 0.0001	2.40 (2.15, 2.68)	< 0.0001	1.77 (1.46, 2.15)	< 0.0001
Bullying victimization frequency in past 30 days										
	(n = 12 855)		(n = 12 782)		(n = 12 865)		(n = 12 967)		(n = 12 635)	
None	1.00		1.00		1.00		1.00		1.00	
1 or 2 days	1.92 (1.65, 2.23)	< 0.0001	1.31 (0.94, 1.84)	0.12	1.75 (1.53, 1.99)	< 0.0001	2.36 (2.10, 2.65)	< 0.0001	1.64 (1.26, 2.15)	0.0003
3–9 days	2.79 (2.32, 3.36)	< 0.0001	0.94 (0.60, 1.47)	0.77	1.93 (1.60, 2.34)	< 0.0001	3.30 (2.61, 4.19)	< 0.0001	2.08 (1.43, 3.04)	0.0001
10 or more days	2.98 (2.22, 4.01)	< 0.0001	2.64 (1.61, 4.30)	0.0001	1.67 (1.29, 2.16)	< 0.0001	2.54 (1.84, 3.50)	< 0.0001	2.53 (1.57, 4.09)	0.0001
Most common type of bullying victimization type in past 30 days										
	(n = 12 833)		(n = 12 763)		(n = 12 845)		(n = 12 950)		(n = 12 615)	
No bullying	1.00		1.00		1.00		1.00		1.00	
Physical	3.14 (2.38, 4.14)	< 0.0001	1.55 (0.92, 2.60)	0.10	2.45 (1.79, 3.35)	< 0.0001	4.28 (3.03, 6.07)	< 0.0001	1.97 (1.36, 2.84)	0.0003
Nonphysical	2.05 (1.74, 2.41)	< 0.0001	1.02 (0.71, 1.46)	0.92	1.71 (1.51, 1.93)	< 0.0001	2.40 (2.12, 2.73)	< 0.0001	2.03 (1.54, 2.67)	< 0.0001
Unspecified	2.14 (1.74, 2.64)	< 0.0001	1.81 (1.27, 2.59)	0.001	1.71 (1.48, 1.98)	< 0.0001	2.39 (2.01, 2.83)	< 0.0001	1.43 (1.10, 1.87)	0.008

Source: Prepared by the authors based on the study results.

^a Adjusted for age, sex, and country of residence.

^b Bolivia, Costa Rica, Honduras, Peru, and Uruguay.

^c AOR: adjusted odds ratio.

^d CI: confidence interval.

TABLE 5. Adjusted logistic regression models^a stratified by country of residence for the association of bullying victimization with two variables: current tobacco use and recent heavy alcohol use

Variable	Bolivia (n = 3 696)		Costa Rica (n = 2 679)		Honduras (n = 1 779)		Peru (n = 2 882)		Uruguay (n = 3 524)	
	AOR ^b (95% CI) ^c	P	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P	AOR (95% CI)	P
Current tobacco use										
Any bullying victimization in the past 30 days										
No	1.00		1.00		1.00		1.00		1.00	
Yes	2.56 (2.09, 3.14)	< 0.0001	1.77 (1.30, 2.39)	0.0003	3.43 (2.12, 5.53)	< 0.0001	1.84 (1.55, 2.20)	< 0.0001	1.89 (1.54, 2.31)	< 0.0001
Recent heavy alcohol use										
Any bullying victimization in the past 30 days										
No	1.00		1.00		1.00		1.00		1.00	
Yes	1.60 (0.93, 2.74)	0.09	1.61 (1.06, 2.45)	0.03	1.47 (0.71, 3.04)	0.30	1.14 (0.74, 1.74)	0.56	1.01 (0.78, 1.31)	0.95

Source: Prepared by the authors based on the study results.

^a Adjusted for age and sex.

^b AOR: adjusted odds ratio.

^c CI: confidence interval.

user (AOR: 1.92, 1 or 2 days; AOR: 2.79, 3–9 days; AOR: 2.98, 10 or more days) and having unprotected sexual intercourse (AOR: 1.64, 1 or 2 days; AOR: 2.08, 3–9 days; AOR: 2.53, 10 or more days). For recent heavy alcohol use, only 10 or more

days of bullying victimization was associated with significantly increased odds (AOR: 2.64). When evaluating bullying victimization type, physical bullying was associated with the greatest odds of current tobacco use (AOR: 3.14), truancy

(AOR: 2.45) and involvement in at least one physical fight (AOR: 4.28) (Table 4).

In logistic regression models, the amount of missing data ranged from 7% (involvement in physical fighting, any bullying) to 20% (suicidal ideation

without planning, bullying type). In models with imputed data, the results were, overall, consistent with the results from the complete case analysis, confirming both magnitude and precision (data not shown). There did appear to be some evidence of bias with bullying overall and recent heavy alcohol use, which was borderline significant in complete case analysis (AOR 1.30; 95% confidence interval (CI): 0.99, 1.69; $P = 0.06$), but did not approach a P -value < 0.05 in the multiple imputation analysis (AOR 1.11; 95% CI: 0.87, 1.41; $P = 0.39$).

DISCUSSION

The overall prevalence of bullying victimization in this study was high (37.8%). While this prevalence was lower than the average from the UNESCO report in 16 Latin American countries (48.7%) (5), it was consistent with another study using GSHS data from low- and middle-income countries worldwide (34.2%) (6). In the present study, Costa Rica and Uruguay had substantially lower prevalence of bullying victimization compared with the UNESCO report (19.5% versus 60.2% and 19.3% versus 50.1% respectively). This may be due to differences in the way bullying was defined; for example, the questions on bullying in the GSHS were much more specific than those in the UNESCO survey, and provided examples of bullying (e.g., “made fun of because of race”; “left out of activities on purpose,” etc.) Another potential explanation could be that the UNESCO survey only included younger children (sixth-grade students); however, data from the region have not indicated a clear difference in bullying victimization prevalence by age (19–22). These differences in prevalence highlight the need for consistent survey methodology to be able to compare bullying across regions and time. To support this type of future research, existing questionnaires previously used in Latin American countries should be considered for multi-country validation (23, 24).

These results suggest that adolescent victims of bullying not only have significantly greater odds of suicidal ideation and behavior but also are more likely to have other behaviors that are potentially detrimental to health. While the association between these diverse negative health behaviors and bully victimization is complex, and the latter factor cannot be the sole explanation for those outcomes,

it should, at the very least, be thought of as one potentially modifiable risk factor. These associations might be best explained through a diathesis–stress model in which individual biological and cognitive vulnerabilities interact with stressful life experiences (e.g., bullying victimization) to cause psychopathology that externalizes as negative health behaviors (8). In addition, the association of bullying with suicidal ideation and behavior might be mediated by depression, or suicidal ideation and behavior might be the result of interaction between bullying victimization (i.e., stressful life event) and preexisting depression (i.e., biological vulnerability) in the diathesis–stress model (25).

In this study, physical and nonphysical bullying had similar effects, especially on suicidal ideation and behavior, consistent with prior studies (4, 26). This supports the notion that stressful life experiences, regardless of form, may trigger adverse health effects in susceptible children. Although this study was not designed to look at causality, an increasing exposure–response pattern, with more frequent bullying victimization associated with greater odds of suicide outcomes and negative health behaviors, was observed, which is also consistent with prior studies (27, 28). The one exception was recent heavy alcohol use, for which only the highest bullying victimization frequency category was significant. Thus bullying may exhibit a threshold relationship with alcohol, and heavy alcohol use might be indicative of a coping mechanism for the most bullied children. However, the lack of an increasing exposure–response relationship with heavy alcohol use might also be due to insufficient power in some of the lower exposure categories.

Despite wide variation in the prevalence of bullying victimization across the five countries included in this study, the relationship between bullying victimization and suicide outcomes, as well as most negative health outcomes examined, was not modified by country of residence. Thus, bullying victimization likely affects health similarly across countries, and those countries with higher rates of bullying victimization would be expected to have higher rates of suicide outcomes and other negative health outcomes (e.g., Peru versus Uruguay, in this study). The two exceptions, which had country-specific differences, were current tobacco use and recent heavy alcohol use. The AOR for

being a current smoker was significant for all countries but highest for Honduras, which had an AOR approximately twice that of Costa Rica, Peru, and Uruguay. Only in Costa Rica was bullying victimization significantly associated with heavy alcohol use, and in Uruguay the odds were essentially null (AOR: 1.01). This might plausibly be due to more widespread social acceptance and use of tobacco and alcohol among all adolescents, regardless of bullying involvement, in some countries, but not others.

Limitations

This study had some important limitations affecting the interpretation of the findings. First, all data were from cross-sectional surveys and therefore temporality is unclear, particularly because recall for suicide outcomes and involvement in a physical fight was for the last 12 months, whereas recall for bullying victimization was for the past 30 days. Second, the models did not take into consideration certain confounders, such as community violence exposure, and potential mediators, such as mental health disorders, for the association between bullying victimization and suicide outcomes, were not explored. Third, the definition of bullying was open to the students’ interpretation, which may have resulted in some misclassification. For example, fighting between two students of the “same strength or power,” as specified in the definition, may not have been considered bullying, using the definition, when in fact it was bullying. Furthermore, certain forms of bullying (e.g., intimidation, humiliation, isolation, and coercion) may not have been fully captured by the definition used. This definition was also limited to school encounters and thus these findings are not generalizable to bullying victimization outside of school. In addition, this definition was specific to bullying victimization, so the results were not tested to determine if they were similar or different for bullying perpetrators (or combined victim/perpetrators). Finally, the results are only generalizable to adolescents who go to school and to the countries included in this analysis. The strengths of this study include the use of 1) nationally representative samples of school-going adolescents from multiple diverse nations in Central and South America and 2) multiple imputation for examination of the effect of

missing data, which can be especially common in surveys asking about personal and/or potentially embarrassing topics.

Future research

Future research in Latin America is needed to investigate the impact of other types of bullying, particularly cyberbullying, and the impact of bullying among specific subgroups, such as the LGBTQ community and racial minorities, to identify the most vulnerable populations. Future versions of the GSHS should consider these issues, as has been done with the Youth Risk Behavior Surveillance System survey in the United States, and include questions on race, sexual orientation, and additional types of bullying.

Conclusions

Bullying victimization among school-going adolescents in Latin America was highly prevalent but varied substantially

by country of residence; it was associated with significantly greater odds of suicidal ideation and behavior, and the number of days bullied had an increasing exposure–response effect. Similarly, bullying victimization was significantly associated with current tobacco use, truancy, physical fighting, and unprotected sexual intercourse. Only highly frequent bullying was associated with recent heavy alcohol use. With the exception of current tobacco use and recent heavy alcohol use, country of residence was not an effect measure modifier for suicide outcomes or negative health behaviors.

In order to support the mental and physical health of adolescents in Latin America, bullying victimization must be a public health priority at a regional level. Given the associations found in this study, addressing this issue might open a door to addressing negative health behaviors, or vice versa. Therefore, more traditional public health interventions aimed at adolescents with a singular focus (e.g., antitobacco campaigns and education) should be

reexamined to determine if there are any opportunities to also target bullying. The ideal approach would be an integrated and comprehensive one that aims to simultaneously reduce bullying and promote mental and physical health.

Acknowledgments. The authors thank all of the schools and students that participated in the Global School-based Student Health Survey (GSHS), and the GSHS country coordinators from Bolivia (Castro Villaroel), Costa Rica (Xinia Gomez), Honduras (Sandra Maribel Sánchez Rivero), Peru (Fresia Cárdenas), and Uruguay (Susana Grumbaum).

Conflicts of interest. None.

Disclaimer. Authors hold sole responsibility for the views expressed in the manuscript, which may not necessarily reflect the opinion or policy of the *RPSP/PAJPH* or the Pan American Health Organization (PAHO).

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Manuscript submitted 2 August 2015. Revised version accepted for publication on 15 March 2016.

RESUMEN

Repercusión de la intimidación en el suicidio y los comportamientos negativos en materia de salud de la población adolescente en América Latina

Objetivo. Comparar la prevalencia de la intimidación, la ideación suicida, el intento de suicidio y los comportamientos negativos en materia de salud (consumo actual de tabaco, consumo reciente de cantidades excesivas de alcohol, ausentismo escolar, participación en riñas y relaciones sexuales sin protección) en cinco países latinoamericanos, y determinar la asociación de la condición de víctima de intimidación con estos resultados, tomando en cuenta tanto el tipo de intimidación como la frecuencia.

Métodos. Los datos para el estudio fueron tomados de las Encuestas mundiales de salud de los estudiantes realizada en las escuelas (EMSEE) de Bolivia, Costa Rica, Honduras, Perú y Uruguay, que incluyeron muestras representativas de adolescentes que asistían a la escuela a nivel nacional. Las encuestas se realizaron con el diseño de conglomerados en dos etapas, por el que seleccionaron primero escuelas y luego aulas. Se aplicaron modelos de regresión logística para determinar la significación estadística de la asociación con la intimidación.

Resultados. Entre los 14 560 adolescentes que asistían a la escuela incluidos en este estudio, la prevalencia de víctimas de algún tipo de intimidación en los 30 últimos días fue de 37,8%. La condición de víctima de intimidación se asoció con mayor probabilidad de ideación suicida con planes concretos (razón de posibilidades ajustada: 3,12; $P < 0,0001$) y al menos un intento de suicidio (razón de posibilidades ajustada: 3,07; $P < 0,0001$). En los resultados relacionados con el suicidio también se observó un efecto del aumento de la exposición (más días de intimidación) en la respuesta. La condición de víctima de intimidación se asoció con mayor probabilidad de consumo actual de tabaco (razón de posibilidades ajustada: 2,14; $P < 0,0001$); ausentismo escolar (razón de posibilidades ajustada 1,76; $P < 0,0001$); participación en riñas (razón de posibilidades ajustada 2,40 $P < 0,0001$), y relaciones sexuales sin protección (razón de posibilidades ajustada: 1,77; $P < 0,0001$).

Conclusiones. Si bien la prevalencia de la intimidación varió de un país a otro, su asociación con la ideación y el comportamiento suicidas y comportamientos negativos en materia de salud permaneció relativamente constante. Abordar la intimidación debe ser una prioridad en América Latina y se necesita un enfoque integrado que también incluya la promoción de la salud mental y física.

Palabras clave

Acoso escolar; adolescente; suicidio; tabaco; consumo de bebidas alcohólicas; agresión; conducta sexual; salud escolar; América Latina.