ARTICLE

Relationships Between Bullying and Violence Among US Youth

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Objective: To determine the extent to which bullying and being bullied, both in and away from school, is associated with involvement in violent behavior.

Design, Setting, and Participants: A US representative cross-sectional sample of 15 686 students in grades 6 through 10 in public and private schools completed the World Health Organization's Health Behaviour in School-aged Children survey in 1998.

Main Outcome Measures: Self-report of weapon carrying, weapon carrying in school, physical fighting, and being injured in a physical fight.

Results: Involvement in each of the violence-related behaviors ranged from 13% to 23% of boys and 4% to 11% of girls. Bullying others and being bullied were consistently related to each violence-related behavior for both boys and girls. Greater odds of involvement occurred with bullying others than being bullied, and greater odds of involvement occurred with bullying that took place away from school than that occurring in school. For example, the adjusted odds ratio for weapon carrying associated with being bullied in school weekly was 1.5, for bullying others in school 2.6, for being bullied away from school 4.1, and for bullying others away from school 5.9.

Conclusion: Bullying should not be considered a normative aspect of youth development, but rather a marker for more serious violent behaviors, including weapon carrying, frequent fighting, and fighting-related injury.

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VIOLENCE AMONG US youth is of national concern. While encouraging declines in violent crimes have been observed over the last decade, rates of aggravated assault and self-reports of nonlethal violence remain high.[1]

The US government and national organizations, such as the American Medical Association, have recently sponsored research and programmatic efforts toward violence prevention.[1,2-5] Successful policies and programs to reduce violence may need to target an overall reduction in aggressive behavior. One form of aggression that merits concern is bullying. Almost 30% of youth grades 6 through 10 report being involved in bullying—as bully, target, or both.[6] By definition, an act of bullying involves an intention-to-harm and a power differential between the bully and target. This power differential separates bullying from reciprocal aggressive acts.[7] The abusive nature of bullying, indicating a lack of regard for others, may be an important risk factor for the perpetration of more serious violent behavior. Little research has addressed this issue. Youth who bullied were found in one study to be more likely to bring weapons to school,[8] and in a study of incarcerated persons, to be more likely to be current or former gang members.[9] Being bullied by others or being perceived as vulnerable has been found to be associated with weapon carrying and violent behavior.[10-15] For example, in an investigation of school-associated violent deaths,[16] researchers found that homicide perpetrators were more than twice as likely as homicide victims to have been bullied by peers.

Prevalence estimates from the 1999 Youth Risk Behavior Surveillance survey[17] indicate that 28.6% of male subjects grades 9 through 12 and 6.0% of female subjects grades 9 through 12 reported carrying a weapon in the past 30 days. In addition, 44.0% of male subjects and 27.3% of female subjects had been in 1 or more physical fight in the past year, and 5.3% of male subjects and 2.8% of female subjects had been injured in a physical fight

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in the past year. While some fighting among adolescent youth is normative, frequent fighting is associated with more adverse outcomes,[18-21] and injury from a fight may represent fighting to a more violent degree. Weapon carrying is particularly concerning, as it may indicate a willingness or intention-to-harm another or a fear for one's own safety.

This study determined the extent to which bullying and being bullied are associated with violence-related behavior. The following 4 violence-related behaviors were selected for inclusion in this study: weapon carrying, weapon carrying at school, frequent fighting, and being injured in a fight. These behaviors are believed to be important indicators of violence because of their potential for physical harm.

METHODS

STUDY POPULATION

The National Institute of Child Health and Human Development supported a nationally representative survey of youth in grades 6 through 10 in US schools during the spring of 1998. The survey, titled Health Behaviour of School-aged Children (HBSC), was part of a collaborative, cross-national research project involving 30 countries in coordination with the World Health Organization.[22] This analysis uses the US sample only. The HBSC protocol required that countries ask identical questions with the same response options based on measures that had been validated in prior research protocols, pretests, or both in multiple countries. The United States added questions such as race or ethnicity, as required for federal surveys, or to expand on required topical questions, such as bullying. Most questions provided precoded response options with some limited written descriptions that were later coded according to HBSC protocols. Survey instruments were anonymous self-administered questionnaires completed by students during 1 class period. The US survey was approved by the National Institute of Child Health and Human Development institutional review board and was carried out by Macro International Inc, Calverton, Md. Active parental and student consent was solicited.

The sampling universe consisted of a comprehensive list of US public, catholic, and other private school students in grades 6 through 10 or their equivalent, excluding schools with enrollment of fewer than 14 students. Primary sampling units were determined to produce nationally representative estimates for each grade, with schools selected according to predetermined school size requirements. Classes were then selected, using simple random sampling, from a suitable frame of classes that represented the target grade in a selected school. All students in a selected class were asked to participate in the study. Because of documented hesitance of schools to participate in surveys taking student class time, expected rejections to requests for participation, and sampling requirements that no replacement schools be used for those rejecting participation, far more schools were drawn into the sampling frame than needed to obtain the precision required for a nationally representative weighted sample to produce 95% confidence estimates of plus or minus 3% for students at each grade. Schools with minority students were oversampled to provide reliable estimates for African Americans and Hispanics, with weighting adjusted to national estimates of the US school enrollment.

Seventeen thousand students responded, resulting in a participation rate of 83% of enrolled students. If records were missing for key variables (eg, age or sex) or had more than 75% of question responses missing, the records were excluded according to HBSC protocol requirements (n=835). The school-based sample design, using 1 class period for completion of the questionnaire, precluded the ability to compare respondent characteristics with nonparticipants. Responding students in sampled classes were excluded if they were out of the target range for grade or their age was outside of the 99th percentile for grade (n=440 students), or if either grade or age were unknown (n=39 students) and national weights adjusted accordingly. The resulting analytic sample was 15686 students in grades 6 through 10.

MEASURES

Measures for this study were obtained from the HBSC self-report questionnaire containing 102 questions about health behavior, demographics, and other relevant variables. Items were based on both theoretical hypotheses related to the social context of adolescents and measurements that had been validated in other studies or previous World Health Organization HBSC surveys.[22] All measures were pretested.

Bullying

Questions about bullying were preceded with the following explanation.[7,23]

Here are some questions about bullying. We say a student is BEING BULLIED when another student, or a group of students, say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she doesn't like. But it is NOT BULLYING when 2 students of about the same strength quarrel or fight.[22(p9)]

Participation in bullying was assessed by 2 parallel questions that asked respondents to report the frequency with which they have bullied others in school and away from school during the current term. Similarly, being bullied was assessed by 2 parallel questions asking respondents to report the frequency with which they have been bullied in school and away from school during the current term. Response categories were "I haven't . . . ," "once or twice," "sometimes," "about once a week," and "several times a week." After examining the response distribution, subjects reporting once a week and those reporting several times a week were collapsed into 1 category representing once a week or more.

Weapon Carrying

Participants were asked on how many days they had carried a weapon, such as a gun, knife, or club, for self-defense in the last 30 days. They also reported how many days they had carried a weapon for self-defense on school property in the last 30 days. Responses for each item were dichotomized to indicate no weapon carrying vs having carried a weapon in the last 30 days.

Frequent Fighting

Participants were asked to report the number of physical fights they had been involved in during the past year. A cutoff point of 4 or more fights was defined as frequent fighting.

Fighting Injuries

Participants were also asked to report the frequency with which they were injured in a physical fight and had to be treated by a

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Table 1. Prevalence of Violence-Related and Bullying Behaviors

Variable	Weighted Percent (95% Confidence Interval) Boys (n = 7316)	Girls (n = 8370)
Carried a weapon in the past 30 days	22.7 (20.9-24.5)	6.8 (5.4-7.8)
Carried a weapon in school in the past 30 days	15.4 (13.7-17.0)	4.2 (3.5-4.9)
≥4 Physical fights in the past year	13.1 (11.5-14.8)	6.0 (5.3-6.8)
Injured in a physical fight in the past year	22.9 (21.1-24.8)	11.0 (9.5-12.6)
Been bullied in school		
None	60.4 (57.9-63.0)	69.3 (67.3-71.3)
Once or twice	23.2 (21.8-24.7)	19.3 (17.9-20.8)
Sometimes	7.7 (6.2-9.2)	6.2 (5.6-7.1)
Weekly	8.7 (7.6-9.7)	5.2 (4.2-6.1)
Been bullied away from school		
None	77.7 (75.8-79.7)	84.2 (82.6-85.9)
Once or twice	13.2 (11.6-14.7)	10.7 (9.4-12.1)
Sometimes	5.3 (4.4-6.2)	3.1 (2.4-3.7)
Weekly	3.8 (3.0-4.5)	2.0 (1.5-2.5)
Bullied others in school		
None	51.5 (49.1-53.8)	66.9 (64.5-69.2)
Once or twice	25.9 (24.3-27.4)	22.0 (20.5-23.4)
Sometimes	11.9 (10.7-13.1)	7.2 (5.8-8.6)
Weekly	10.7 (9.5-12.0)	4.0 (3.3-4.6)
Bullied others away from school		
None	70.2 (68.3-72.0)	80.5 (78.6-82.4)
Once or twice	16.3 (14.8-17.7)	12.6 (11.4-13.9)
Sometimes	6.9 (5.9-7.8)	4.4 (3.6-5.2)
Weekly	6.7 (5.7-7.7)	2.5 (2.0-3.0)

physician or nurse in the past year. Responses were dichotomized to indicate no injury from fighting vs 1 or more injuries from fighting in the past year.

STATISTICAL ANALYSES

Statistical sample weights were developed to adjust for the minority oversampling and to obtain student totals by grade comparable to population grade estimates from the US National Center for Education Statistics. Weighted data analyses were conducted using SUDAAN software to adjust variance estimates to account for the sample design and clustering.[24]

Descriptive analyses were conducted to obtain the percent distributions by sex for each violence-related behavior (ie, weapon carrying, weapon carrying at school, frequent fighting, and being injured in a fight) by involvement in bullying behaviors. Logistic regression analyses were used to estimate odds ratios for each violence-related behavior. Separate models were run for each bullying behavior with sex. However, the same students may be involved in more than 1 of 4 bullying behaviors assessed—for example, bullying others both in and away from school, or being both a bully and a target. To assess the independent effect of each type of bullying behavior as well as the additive effect of involvement in multiple bullying behaviors, multivariate logistic regressions were run with the 4 bullying measures and sex as independent variables.

RESULTS

As given in **Table 1**, involvement in each of the violence-related behaviors was more common in boys than in girls, ranging from 13% to 23% of boys and 4% to 11% of girls. These numbers provide national prevalence estimates of more than 2.7 million students who have carried a weapon in the last 30 days; more than 1.8 million students who have carried a weapon to school in the last 30 days; more than 1.7 million students who have been in 4 or more physical fights in the past year; and more than 2.9 million students who have been injured in a physical fight in the past year. Being bullied in school was reported by significantly more students then being bullied away from school. Being bullied in school either sometimes or weekly was reported by 16% of boys and 11% of girls, while being bullied away from school to this degree was reported by 9% of boys and 5% of girls. Bullying others in school was reported by significantly more students than bullying others away from school. Moderate (sometimes) or frequent (weekly) bullying of others in school was reported by 23% of boys and 11% of girls, and away from school by 14% of boys and 7% of girls.

Bullying or being bullied, whether in or away from school, was consistently related to each of the 4 violence-related behaviors (**Table 2**). The highest risk for weapon carrying was associated with bullying others in or away from school and being bullied away from school, with about 70% of boys and 30% to 40% of girls involved in bullying away from school weekly reporting carrying a weapon in the past month. About 50% of boys and 30% of girls who had bullied others in school weekly reported weapon carrying compared with 36% of boys and 15% of girls who had been bullied in school weekly. Sex differences were observed for the fighting indicators. For boys, frequent fighting and being injured in a fight were most strongly associated with bullying others (both in and away from school) and being bullied away from school; for girls, they were most strongly associated with bullying others (both in school and away from school).

Results from the logistic regression analyses indicate consistent patterns of results across the violence-related behaviors (**Table 3**). Involvement in bullying, both for bullies and targets, was associated with greater odds of weapon carrying, fighting, and injury from fighting. These relationships were strongest for weapon carrying but were notable for fighting and fighting injuries as well. Weapon carrying and injury from a fight were most strongly associated with involvement in bullying that occurred away from school, whether as bully or target. Bullying others, regardless of location, was most associated with frequent fighting. In the multivariate model, the relationships between bullying behaviors and violence-related behaviors remained consistent, although the magnitude of the odds ratios decreased owing to correlation among bullying behaviors. By multiplying the odds ratios for given behaviors, it is possible to determine the association of each violence-related behavior with multiple bullying behaviors.[25] For example, youth who are bullied both in and away from school sometimes would have 2.7 times greater odds of carrying a weapon while youth who are bullied sometimes in and away from school and who also bully others away from school weekly would have 15.9 times greater odds of carrying a weapon.

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Table 2. Prevalence of Violence-Related Behaviors by Bullying Behaviors

	Weighted Percent (95% Confidence Interval)			
	Carried a Weapon	Carried a Weapon in School	Frequent Fighting	Injured in a Fight
Boys				
Been bullied in school				
None	18.7 (16.2-20.7)	12.2 (10.6-13.8)	12.4 (10.5-14.4)	18.3 (16.6-20.1)
Once or twice	23.9 (21.4-26.5)	15.7 (13.2-18.2)	12.2 (9.8-14.7)	27.3 (24.0-30.7)
Sometimes	35.4 (29.4-41.4)	23.8 (18.4-29.3)	11.2 (8.1-14.2)	35.2 (26.1-44.2)
Weekly	36.4 (30.0-42.7)	28.7 (21.8-35.6)	22.6 (15.6-29.6)	31.8 (24.6-38.9)
Been bullied away from school				
None	16.9 (15.3-18.5)	10.6 (9.3-12.0)	11.2 (9.8-12.7)	17.9 (16.0-19.7)
Once or twice	32.9 (28.3-37.5)	22.9 (19.1-26.8)	15.0 (11.2-18.7)	32.0 (27.1-36.8)
Sometimes	46.7 (40.3-53.0)	34.1 (26.5-41.7)	16.2 (11.0-21.4)	45.3 (36.7-53.9)
Weekly	71.1 (64.4-77.8)	54.8 (48.9-60.7)	35.5 (26.0-45.1)	64.4 (56.2-72.6)
Bullied others in school				
None	13.4 (11.5-15.3)	7.9 (6.7-9.1)	8.3 (7.0-9.6)	16.2 (13.5-18.9)
Once or twice	23.3 (20.6-25.9)	14.0 (11.3-16.6)	10.0 (8.7-13.3)	23.0 (19.9-26.1)
Sometimes	35.2 (28.6-41.8)	25.1 (18.2-32.1)	15.1 (11.6-18.7)	33.3 (28.2-38.4)
Weekly	52.2 (47.9-56.4)	43.1 (38.8-47.4)	38.7 (33.2-44.2)	45.7 (39.9-51.4)
Bullied others away from school				
None	14.3 (12.9-15.7)	8.4 (7.2-9.5)	8.8 (7.4-10.1)	16.6 (14.5-18.7)
Once or twice	30.4 (26.3-34.6)	20.3 (16.4-24.3)	14.1 (11.0-17.2)	27.0 (23.5-30.6)
Sometimes	42.8 (35.4-50.2)	33.0 (26.7-39.2)	24.2 (18.1-30.4)	45.7 (40.2-51.1)
Weekly	70.2 (61.7-78.7)	58.1 (51.2-65.1)	44.8 (37.7-51.9)	56.1 (48.4-63.9)
Girls				
Been bullied in school				
None	5.7 (4.2-6.9)	3.3 (2.5-4.1)	5.0 (4.1-5.9)	9.0 (7.6-10.5)
Once or twice	5.9 (4.0-7.9)	4.2 (2.9-5.4)	6.1 (4.5-7.7)	11.7 (9.3-14.0)
Sometimes	12.6 (8.3-16.8)	9.3 (5.3-13.3)	11.5 (6.6-16.5)	22.7 (14.9-30.5)
Weekly	15.0 (9.9-20.2)	10.4 (4.2-16.7)	13.0 (8.0-18.0)	22.1 (16.5-27.7)
Been bullied away from school				
None	5.4 (4.3-6.5)	3.1 (2.4-3.7)	5.4 (4.5-6.3)	9.0 (7.6-10.5)
Once or twice	9.5 (6.5-12.6)	7.4 (4.8-10.0)	7.5 (5.0-10.1)	18.4 (13.9-22.8)
Sometimes	12.6 (7.7-17.6)	10.6 (5.8-15.5)	14.9 (8.3-21.5)	27.2 (19.7-34.7)
Weekly	32.8 (21.5-44.2)	26.9 (16.2-37.6)	12.4 (6.0-18.8)	37.3 (24.6-50.0)
Bullied others in school				
None	3.7 (2.8-4.5)	2.3 (1.6-2.9)	4.2 (3.5-5.0)	6.7 (5.8-7.7)
Once or twice	7.7 (5.9-9.5)	5.4 (4.1-6.7)	7.0 (5.4-8.6)	14.1 (11.8-16.3)
Sometimes	17.9 (9.2-26.6)	9.4 (5.6-13.2)	10.4 (7.1-13.6)	31.1 (21.2-41.0)
Weekly	29.2 (21.2-37.2)	21.8 (14.6-29.0)	23.6 (17.4-29.7)	32.6 (24.1-41.0)
Bullied others away from school				
None	3.9 (3.1-4.7)	2.5 (1.9-3.0)	4.3 (3.6-4.9)	7.3 (6.2-8.4)
Once or twice	11.6 (8.3-14.8)	8.2 (5.7-10.7)	8.8 (6.7-10.9)	20.6 (16.2-25.0)
Sometimes	21.6 (15.3-27.9)	11.5 (7.4-15.6)	20.2 (14.3-26.1)	39.0 (28.4-49.6)
Weekly	40.9 (28.5-53.4)	28.3 (17.0-39.6)	24.1 (16.4-31.8)	39.5 (28.8-50.2)

COMMENT

In this study, a strong and consistent relationship between bullying and involvement in violent behaviors was observed. This suggests that bullying is likely to occur concurrently with more serious aggressive behavior, and while prevalent, should not be considered a normative aspect of youth development.

Several highly publicized incidents in which youth who were bullied later committed violent acts have raised the question as to what extent being bullied is associated with violent behavior. Findings from this study indicate that there are consistent relations between bullying and violent behavior. However, the association is strongest not for the targets for bullying, but rather for the bullies themselves. In addition, the magnitude of the association is related to the context in which the bullying occurs, with stronger associations for bullying that occurs away from school. Bullying that occurs away from school, where there is less adult supervision and less protection for youth, may be more likely to escalate into more severe violent behavior. This pattern was also observed for weapon carrying that occurred in school. That is, bullying that occurred away from school was more highly associated with weapon carrying in school than bullying that occurred in school. As such, efforts to reduce violence in the school may need to address aggression and violence in the youth's larger community context.

Findings from this study suggest that programs designed to reduce violent behaviors should address less severe forms of aggressive behavior, particularly bullying. Bullying, as a behavior that is by definition inflicted with the desire to harm another, seems to be an important marker for violence-related behaviors. Moreover, vio-

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Table 3. Unadjusted and Adjusted Odds Ratios of Violence-Related Behaviors Associated With Bullying

	Carried a Weapon	Carried a Weapon in School	Frequent Fighting	Injured in a Fight
	Unadjusted Odds Ratios (95% Confidence Interval)			
Been bullied in school*				
Once or twice	1.3 (1.1-1.5)	1.3 (1.1-1.6)	1.1 (0.9-1.3)	1.5 (1.3-1.8)
Sometimes	2.4 (1.8-3.2)	2.4 (1.9-3.2)	1.3 (1.0-1.9)	2.6 (1.9-3.6)
Weekly	2.6 (2.0-3.3)	3.0 (2.3-4.0)	2.3 (1.6-3.3)	2.3 (1.8-3.0)
Gender†				
Boys	4.0 (3.2-5.0)	3.9 (3.1-4.8)	2.3 (1.0-2.7)	2.3 (1.8-2.7)
Been bullied away from school*				
Once or twice	2.2 (1.9-2.7)	2.5 (2.1-3.0)	1.4 (1.1-1.8)	2.2 (1.8-2.7)
Sometimes	3.7 (3.0-4.7)	4.2 (3.2-5.4)	1.9 (1.4-2.6)	3.8 (2.8-5.1)
Weekly	10.7 (8.1-14.0)	10.6 (8.3-13.5)	3.8 (2.8-5.1)	7.4 (5.6-9.8)
Gender†				
Boys	4.0 (3.2-4.9)	3.7 (3.1-4.6)	2.2 (1.8-2.6)	2.2 (1.9-2.6)
Bullied others in school*				
Once or twice	2.0 (1.8-2.4)	2.0 (1.7-2.4)	1.5 (1.2-1.9)	1.8 (1.5-2.2)
Sometimes	4.1 (3.1-5.4)	4.1 (2.9-5.8)	2.2 (1.7-2.7)	3.7 (2.9-4.8)
Weekly	8.0 (6.5-9.7)	9.6 (7.7-11.9)	7.1 (5.7-8.9)	5.1 (3.9-6.8)
Gender†				
Boys	3.4 (2.8-4.2)	3.2 (2.6-3.9)	1.9 (1.6-2.2)	2.0 (1.7-2.4)
Bullied others away from school*				
Once or twice	2.8 (2.3-3.4)	3.0 (2.3-3.9)	1.9 (1.5-2.3)	2.3 (2.0-2.8)
Sometimes	5.1 (4.0-6.6)	5.3 (4.2-6.7)	4.1 (3.2-5.2)	5.5 (4.5-6.8)
Weekly	15.0 (10.8-20.8)	15.3 (11.8-20.0)	8.2 (6.3-10.7)	7.1 (5.1-10.0)
Gender†				
Boys	3.7 (3.0-4.5)	3.4 (2.8-4.2)	2.0 (1.7-2.3)	2.1 (1.7-2.5)
	Adjusted Odds Ratios (95% Confidence Interval)			
Been bullied in school*				
Once or twice	1.0 (0.9-1.2)	1.0 (0.8-1.3)	1.0 (0.8-1.2)	1.2 (1.0-1.5)
Sometimes	1.5 (1.0-2.1)	1.5 (1.0-2.0)	1.0 (0.7-1.5)	1.5 (1.1-2.2)
Weekly	1.5 (1.2-1.9)	1.6 (1.2-2.2)	1.7 (1.2-2.4)	1.3 (1.1-1.7)
Been bullied away from school*				
Once or twice	1.5 (1.3-1.9)	1.7 (1.4-2.0)	1.0 (0.8-1.4)	1.5 (1.2-2.0)
Sometimes	1.8 (1.4-2.4)	2.1 (1.6-2.7)	1.1 (0.7-1.5)	1.9 (1.3-2.8)
Weekly	4.1 (2.9-5.8)	3.8 (2.8-5.2)	1.3 (0.9-1.9)	3.5 (2.6-4.8)
Bullied others in school*				
Once or twice	1.4 (1.2-1.7)	1.4 (1.2-1.7)	1.2 (0.9-1.5)	1.3 (1.1-1.6)
Sometimes	2.0 (1.5-2.7)	2.0 (1.4-2.8)	1.3 (1.0-1.7)	1.9 (1.3-2.6)
Weekly	2.6 (1.9-3.5)	3.2 (2.3-4.3)	3.1 (2.2-4.3)	2.2 (1.6-3.0)
Bullied others away from school*				
Once or twice	1.8 (1.4-2.4)	1.9 (1.4-2.5)	1.6 (1.2-2.1)	1.6 (1.3-2.0)
Sometimes	2.6 (1.9-3.4)	2.5 (1.9-3.2)	2.9 (2.2-3.8)	2.9 (2.2-3.9)
Weekly	5.9 (3.8-9.1)	5.1 (3.6-7.3)	3.5 (2.4-5.3)	3.3 (2.3-4.6)
Gender†				
Boys	3.4 (2.8-4.2)	3.1 (2.6-3.8)	1.8 (1.5-2.1)	1.9 (1.6-2.3)

*Reference group is "none."
†Reference group is girls.

lence prevention programs should not only focus on specific aggressive behaviors but also on fostering positive and health-promoting family and school environments.[23,26] Finally, considering the relationship of bullying that occurs away from school to in-school violence, programs should address the problems of safety in the larger community context.

Several limitations of the study should be noted. The HBSC is a broadly focused survey regarding the health behaviors of middle and high school–aged youth. As such, more in-depth information on bullying or violent behaviors is unavailable. Data are cross-sectional, and so findings can only provide information about associations among variables rather than indicating causal pathways. Another limitation of this study is the reliance on self-report for measurement of bullying and violent behaviors. However, self-report is a common and accepted method of measuring these behaviors, and estimates of the prevalence of violent behaviors, such as weapon carrying, are similar to that obtained in other national surveys.[17] Other sources for national estimates of bullying behavior are unavailable for comparison. Understanding that individual's perceptions of bullying may vary, students were provided with a detailed definition of bullying along with examples. Finally, as is typical of school-based self-report measures (eg, Youth Risk Behavior Surveillance survey[17] or Monitoring the Future[27]), only those students in attendance at school in mainstream classes were measured, and because students may choose not to an-

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What This Study Adds

Violence among youth is of national concern. Bullying is known to be a common behavior among school-aged youth and is associated with poorer psychosocial adjustment. However, it is not known to what extent bullying and being bullied is associated with violence-related behaviors. This study provides evidence that bullying is associated with key violence-related behaviors including weapon carrying and fighting injuries. These associations were stronger for bullies than targets, and stronger for bullying that occurred away from school. Bullying should be considered an important marker for violence-related behaviors.

swer individual questions, findings may be affected by nonresponse bias.

This study provides an important addition to the current body of literature on violence among youth. To date, we are unaware of another study specifically addressing the relationship of bullying to violence-related behaviors. Results from this study indicate that both bullying and being bullied are associated with higher rates of weapon carrying, fighting, and fighting injuries. Based on estimates from this study, approximately 2.7 million students have carried a weapon in the last 30 days, with more than 1.8 million carrying a weapon to school. More than 1.7 million students are frequent fighters, and more than 2.9 million have been injured in a fight in the past year. Most youth are concurrently involved in moderate or frequent bullying, as bully and/or target, and the rates of violence consistently increase with increased frequency of bullying. These findings provide a basis for future research and violence prevention efforts.

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