ORIGINAL ARTICLE

Adult Psychiatric Outcomes of Bullying and Being Bullied by Peers in Childhood and Adolescence

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Importance: Both bullies and victims of bullying are at risk for psychiatric problems in childhood, but it is unclear if this elevated risk extends into early adulthood.

Objective: To test whether bullying and/or being bullied in childhood predicts psychiatric problems and suicidality in young adulthood after accounting for childhood psychiatric problems and family hardships.

Design: Prospective, population-based study.

Setting: Community sample from 11 counties in Western North Carolina.

Participants: A total of 1420 participants who had being bullied and bullying assessed 4 to 6 times between the ages of 9 and 16 years. Participants were categorized as bullies only, victims only, bullies and victims (hereafter referred to as bullies/victims), or neither.

Main Outcome Measure: Psychiatric outcomes, which included depression, anxiety, antisocial personality disorder, substance use disorders, and suicidality (including recurrent thoughts of death, suicidal ideation, or a suicide attempt), were assessed in young adulthood (19, 21, and 24-26 years) by use of structured diagnostic interviews.

Results: Victims and bullies/victims had elevated rates of young adult psychiatric disorders, but also elevated rates of childhood psychiatric disorders and family hardships. After controlling for childhood psychiatric problems or family hardships, we found that victims continued to have a higher prevalence of agoraphobia (odds ratio [OR], 4.6 [95% CI, 1.7-12.5]; $P<.01$), generalized anxiety (OR, 2.7 [95% CI, 1.1-6.3]; $P<.001$), and panic disorder (OR, 3.1 [95% CI, 1.5-6.5]; $P<.01$) and that bullies/victims were at increased risk of young adult depression (OR, 4.8 [95% CI, 1.2-19.4]; $P<.05$), panic disorder (OR, 14.5 [95% CI, 5.7-36.6]; $P<.001$), agoraphobia (females only; OR, 26.7 [95% CI, 4.3-52.5]; $P<.001$), and suicidality (males only; OR, 18.5 [95% CI, 6.2-55.1]; $P<.001$). Bullies were at risk for antisocial personality disorder only (OR, 4.1 [95% CI, 1.1-15.8]; $P<.04$).

Conclusions and Relevance: The effects of being bullied are direct, pleiotropic, and long-lasting, with the worst effects for those who are both victims and bullies.

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RESEARCH ON BULLYING CAN be traced to the 1960s; however, back then, it was called mobbing and was described as collective aggression against others of the same species.[1] Systematic intervention research started when 3 young boys killed themselves in short succession in Norway, all leaving notes that they had been bullied by their peers.[2] Since then, it has been repeatedly reported that being a victim of bullying increases the risk of adverse outcomes, including physical health problems,[3] behavior and emotional problems and depression,[4] psychotic symptoms,[5] and poor school achievement.[6] Furthermore, being bullied is associated with an increased risk of suicide ideation and suicide attempts,[7] with some evidence that those who are both victims and bullies (hereafter referred to as bullies/victims)[8] are at higher risk for suicidality.[9] In contrast, the major adverse outcome of being a bully in childhood has been reported to be offending.[10,11] However, bullying is still commonly viewed as just a harmless rite of passage or an inevitable part of growing up.[12]

Longitudinal studies on bullying that involve the victims or the bullies/victims (hereafter referred to as bullying involvement) have tended to be short-term studies, following children either for a few months or for a few years into adolescence.[4] Thus, it is unclear whether the ef-

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fects of being bullied extend into adulthood. To date, one Finnish cohort study has reported on the involvement of children in bullying at 8 years of age and the adult outcomes, using information from the military call-up registry, the national psychiatric register,[13] self-report of depression and suicide ideation,[14] national police crime records,[13] Finnish hospital discharge registers,[15] or cause-of-death registries.[16] The frequent victimization of boys during childhood was found to predict adult anxiety disorders, frequent bullying was found to predict antisocial personality disorder, and male bullies/victims were reported at increased risk for both anxiety disorders and antisocial personality disorder. However, most male bullies/victims (97%), most male bullies (80%), and 50% of male victims also screened positive for behavioral problems at the age of 8 years.[13] Thus, once behavioral or emotional problems in childhood were accounted for, the effects of bullying involvement became nonsignificant in males. In contrast to boys, girls were rarely victimized (3.6%), and they very rarely frequently bullied others (0.6%) or were frequent bullies/victims (0.2%),[13] but female victims remained at higher risk for psychopathology and suicidality,[15,16] even after controlling for childhood emotional problems. This suggests that, for girls, peer victimization may be more traumatic. Peer victimization in childhood may be a marker of present and later psychopathology rather than a cause of long-term adverse outcomes,[17] at least for boys. The Finnish study[18] relied on registry data in adulthood, but only a minority of those with psychiatric problems are recognized in the health system.

Our study investigates the long-term effects of bullying involvement in childhood and adolescence on self-reported psychiatric outcomes in young adulthood, including suicidality. We expected victims to more often have emotional problems, bullies/victims to additionally be at risk for suicidality, and bullies to be at risk for antisocial personality disorder. Sex differences are tested to determine possible differential susceptibility, as previously suggested. Both childhood and adolescent bullying involvement and young adulthood psychiatric outcomes were assessed using structured interviews administered multiple times in a large community sample.

METHODS

PARTICIPANTS

The Great Smoky Mountain Study is a population-based sample of 3 cohorts of children 9, 11, and 13 years of age at enrollment, recruited from 11 counties in Western North Carolina in 1993 using a multistage, overlapping cohorts design with a multistep probability sampling procedure proportional to the total number of age-eligible children in the household (eFigure, jamapsych.com).[19] Each age cohort reaches a given age in a different year, reducing the time needed to study the effects of age. The first stage involved screening parents (N=3896) for child behavior problems. All non–American Indian children scoring in the top 25% on a behavioral problems screener, plus a 1-in-10 random sample of the rest, were recruited for detailed interviews. All participants were given a weight inversely proportional to their probability of selection, so that the results are representative of the population from which the sample was drawn. This means that participants who have high scores are weighted down and that randomly selected participants are weighted up so that oversampling does not bias prevalence estimates. About 8% of the area residents and of the sample are African American, and fewer than 1% are Hispanic. American Indians make up only about 3% of the study area, but they were recruited regardless of screening score and constitute 25% of the sample. Of all the participants recruited, 80% (N=1420) agreed to participate. The weighted sample was 49.0% female.

PROCEDURE

Annual assessments were completed with the child and the primary caregiver until the adolescent turned 16 years of age and then with the participant again at 19, 21, and 24 to 26 years of age (completed in 2010). A total of 6674 assessments were completed on 1420 participants in childhood and adolescence (9-16 years of age), and a total of 3184 assessments were completed in young adulthood (19, 21, and 24-26 years of age). An average of 83% of possible interviews was completed overall (range, 75%-94%). Before interviews, participants signed informed consent forms approved by the Duke University Medical Center institutional review board.

ASSESSMENT OF BULLYING

At each assessment between the ages of 9 and 16 years, the child and the primary caregiver reported on whether the child had been bullied or teased or had bullied others in the 3 months immediately prior to the interview, as part of the Child and Adolescent Psychiatric Assessment[20] (full definitions provided in the eTable). Being bullied or bullying others was counted if reported by either the parent or the child at any childhood or adolescent assessment. If the informant reported that the participant had been bullied or had bullied others, then the informant was asked separately how often the bullying occurred in the prior 3 months in the following 3 settings: home, school, and community. Parent and child agreement ($\kappa=0.24$) was similar to that of other bullying measures.[5] Although this measure may seem low, a large meta-analysis of parent and child reports of behavioral and emotional functioning demonstrates similar concordance levels.[21] All participants were categorized as victims only, bullies only, both (bullies/victims), or neither.

ASSESSMENT OF ADULT OUTCOMES

Outcome status was positive if the participant met criteria for a psychiatric disorder at 19, 21, or 24 to 26 years of age. All outcomes were assessed through self-report interviews with the Young Adult Psychiatric Assessment (YAPA).[20] The time frame for the YAPA was the 3 months immediately preceding the interview. Scoring programs, written in SAS,[22] combined information about the date of onset, duration, and intensity of each symptom to create diagnoses according to the *DSM-IV*.[23] Two-week test-retest reliability of the YAPA is comparable to that of other highly structured interviews (κ values for individual disorders range from 0.56 to 1).[24] Validity is well established using multiple indices of construct validity.[20] The YAPA interview itself, the YAPA glossary, and all diagnostic codebooks are available at http://devepi.duhs.duke.edu/instruments.html.

The diagnoses made included any *DSM-IV* anxiety disorder (generalized anxiety, agoraphobia, panic disorder, social phobia, obsessive-compulsive disorder, and posttraumatic stress disorder), depressive disorders (major depression, minor depression, and dysthymia), antisocial personality

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Table 1. Associations Between Bully-Victim Groups and Young Adult Psychiatric Outcomes[a]

Outcome	Weighted % of Participants per Group				Victim vs Neither, OR (95% CI)	*P* Value	Bully/Victim vs Neither, OR (95% CI)	*P* Value	Bully vs Neither, OR (95% CI)	*P* Value
	Neither (n = 789)	Bully (n = 100)	Victim (n = 305)	Bully/ Victim (n = 79)						
Depressive disorders	3.3	5.0	10.2	21.5	**3.4 (1.5-7.9)**	**.004**	**8.2 (2.6-25.5)**	**<.001**	1.6 (0.6-4.1)	.36
Suicidality	5.7	2.0	9.0	24.8	1.6 (0.7-4.0)	.29	**5.5 (1.7-17.4)**	**.004**	0.3 (0.1-1.2)	.10
Anxiety disorders	6.3	12.5	24.2	32.2	**4.7 (2.5-9.1)**	**<.001**	**7.1 (2.6-18.8)**	**<.001**	2.1 (0.7-6.3)	.18
Generalized anxiety	3.1	9.1	10.2	13.6	**3.6 (1.4-9.3)**	**.008**	**5.0 (1.4-18.5)**	**.02**	3.2 (0.8-13.5)	.11
Panic disorder	4.6	5.8	13.1	38.4	**3.2 (1.5-6.7)**	**.002**	**13.1 (5.0-34.1)**	**<.001**	1.3 (0.5-3.2)	.56
Agoraphobia	2.3	2.7	11.1	10.3	**5.3 (2.0-13.9)**	**<.001**	**4.9 (1.0-23.6)**	**.04**	1.2 (0.3-4.2)	.78
Antisocial personality disorder	2.1	9.4	0.5	2.6	0.3 (0.1-1.1)	.06	1.3 (0.3-5.3)	.74	**4.9 (1.0-23.3)**	**.04**
Alcohol disorders	16.4	29.0	15.6	22.9	1.0 (0.5-1.7)	.83	1.5 (0.6-4.1)	.41	2.1 (0.9-4.8)	.09
Marijuana disorder	15.9	24.8	14.7	16.1	0.9 (0.5-1.7)	.77	1.0 (0.4-2.9)	.97	1.8 (0.8-4.0)	.19

[a] Participants were categorized as bullies only, victims only, bullies and victims (hereafter referred to as bullies/victims), or neither. The odds ratios (ORs) and 95% CIs in bold are significant at $P < .05$.

disorder, alcohol abuse or dependence, and marijuana abuse or dependence. Psychosis was not included in the analyses because it was very rare in the community. Suicidality was assessed as part of the criteria for major depressive episode.[25] Suicidality involves either recurrent thoughts of wanting to die, recurrent suicidal ideation without a specific plan, suicidal plans, or a suicide attempt. Too few participants attempted suicide (n=5) for us to study this group separately from ideation. As such, the focus of this analysis was on the broader construct of suicidality rather than the individual aspects of suicidality.

ASSESSMENT OF CHILDHOOD STATUS

All childhood psychiatric and family hardship variables (except when indicated) were assessed by parent and child report using the Child and Adolescent Psychiatric Assessment.[20] The time frame for the Child and Adolescent Psychiatric Assessment was the 3 months immediately preceding the interview.

Childhood psychiatric variables included the same anxiety and depressive disorders as in adulthood, behavioral disorders (conduct disorder, attention-deficit/hyperactivity disorder, and oppositional defiant disorder), and any substance abuse or dependence. Participants were assessed as positive for a diagnosis if they met full *DSM-IV* criteria for the disorder at any childhood assessment. Childhood suicidality was assessed as it was during young adulthood.

Four types of family hardships were assessed: low socioeconomic status, unstable family structure, family dysfunction, and maltreatment. A low socioeconomic status was assessed as positive if the child's family met 2 or more of the following conditions: below the US federal poverty line based on family size and income, parental high school education only, or low parental occupational prestige.[26] Unstable family structure was assessed as positive if the child's family met 2 or more of the following conditions: single parent structure, stepparent in household, divorce, parental separation, or change in parent structure. Family dysfunction was assessed as positive if the child's family met 5 or more of the following conditions: inadequate parental supervision of child's free time; overinvolvement of the parent in the child's activities in an age-inappropriate manner; physical violence between parents; top 20% in terms of frequency of parental arguments; marital relationship characterized by absence of affection, apathy, or indifference; child is upset by or actively involved in arguments between parents; mother scores in elevated range on depression questionnaire; top 20% in terms of frequency of arguments between parent and child; and most parental activities are source of tension or worry for the child. Maltreatment was assessed as positive if the child or parent reported that the child had been physically abused (the participant was the victim of intentional physical violence by family member), sexually abused (the participant was involved in activities for purposes of perpetrator's sexual gratification, including kissing, fondling, oral-genital, oral-anal, genital, or anal intercourse), or neglected by parents (caregiver unable to meet child's need for food, clothing, housing, transportation, medical attention, or safety). Codebooks for all items are available at http://devepi.duhs.duke.edu/codebooks.html.

STATISTICAL ANALYSES

Multiple assessments were completed in childhood (9-16 years) and young adulthood (19, 21, and 24-26 years). Status for all variables were aggregated across assessments within these periods. Thus, if an individual reported suicidality at any young adult assessment, they were assessed as positive for suicidality in adulthood. All associations were tested using weighted logistic regression models in a generalized estimating equations framework implemented by SAS PROC GENMOD (SAS Institute Inc). Robust variance (sandwich-type) estimates were used to adjust the standard errors of the parameter estimates for the sampling weights applied to observations. Bivariate analyses in **Table 1** and **Table 2** involved prediction of outcome variables by dummy-coded variables comparing each bully-victim group with the "neither" group. Multivariable analyses in

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Table 2. Associations Between Bully-Victim Groups and Childhood Psychiatric Disorders and Family Hardships[a]

Outcome	Weighted % of Participants per Group				Victim vs Neither, OR (95% CI)	*P* Value	Bully/Victim vs Neither, OR (95% CI)	*P* Value	Bully vs Neither, OR (95% CI)	*P* Value
	Neither (n = 789)	Bully (n = 100)	Victim (n = 305)	Bully/ Victim (n = 79)						
Child psychiatric disorders										
Depressive disorders	5.7	13.0	8.1	31.3	1.5 (0.7-3.0)	.30	**7.6 (3.0-18.8)**	**<.001**	2.5 (0.9-6.8)	.08
Suicidality	10.6	14.7	21.5	22.7	**2.3 (1.3-4.0)**	**.003**	**2.5 (1.1-5.7)**	**.03**	1.5 (0.8-2.8)	.26
Anxiety disorders	5.9	13.7	16.7	19.7	**3.2 (1.7-6.0)**	**<.001**	**3.9 (1.7-9.0)**	**.001**	2.5 (0.9-7.0)	.07
Disruptive disorders	8.0	60.7	16.3	88.3	**2.2 (1.4-3.7)**	**.002**	**87.0 (28.1-269.2)**	**<.001**	**17.8 (8.3-38.0)**	**<.001**
Substance use disorders	6.9	24.9	9.3	28.0	1.4 (0.6-3.0)	.41	**5.3 (2.1-13.3)**	**<.001**	**4.5 (2.0-10.3)**	**<.001**
Social/family hardships										
Low socioeconomic status	39.9	51.2	40.5	46.1	**1.6 (1.0-2.4)**	**.03**	2.0 (0.9-4.3)	.08	**2.5 (1.2-4.9)**	**.01**
Family instability	23.5	39.5	28.8	42.0	1.3 (0.8-2.1)	.23	**2.3 (1.1-5.2)**	**.03**	**2.1 (1.1-4.4)**	**.04**
Family dysfunction	19.6	54.6	37.7	56.9	**2.5 (1.6-3.9)**	**<.001**	**5.4 (2.5-12.0)**	**<.001**	**4.9 (2.5-9.9)**	**<.001**
Maltreatment	15.1	43.3	26.5	49.4	**2.0 (1.3-3.2)**	**.003**	**5.5 (2.5-12.0)**	**<.001**	**4.3 (2.1-8.8)**	**<.001**

[a] Participants were categorized as bullies only, victims only, bullies and victims (hereafter referred to as bullies/victims), or neither. The odds ratios (ORs) and 95% CIs in bold are significant at $P < .05$.

Table 3 involved prediction of young adult outcome variables by bully-victim status but also included childhood psychiatric variables and hardships as covariates. As such, these models test the effect of bully-victim status on later psychiatric outcomes after statistically accounting for the effects of early psychiatric problems and hardships. Finally, a sex × bully-victim status interaction term was included in multivariable models to test for sex-specific long-term effects. Odds ratios, 95% CIs, and *P* values are provided for all analyses.

RESULTS

DESCRIPTIVE STATISTICS

A total of 421 child or adolescent participants (26.1%; all percentages weighted) reported being bullied at least once; 8.9% (n = 159) reported being bullied more than once. Rates were not significantly higher in boys than in girls (28.8% vs 23.4%; $P = .15$). Being bullied was twice as common in childhood (9-13 years) as in adolescence (14-16 years) (23.5% vs 10.2%; $P < .001$).

Bullying others was reported by 9.5% (n = 198) and was more common among victims of bullying (odds ratio, 2.9 [95% CI, 2.0-4.1]; $P < .001$). Independent groups were derived based on bullying and victim status: 5.0% (n = 112) were bullies only, 21.6% (n = 335) were victims only, 4.5% (n = 86) were both bullies and victims (bullies/victims), and 68.9% (n = 887) were neither. Further analyses are based on these groups. Compared with the "neither" group, both bullies/victims and bullies were more likely to be male, but victim status did not differ by sex (bullies/victims: 72.4% male vs 47.8% female [$P < .01$]; bullies: 69.1% male vs 47.8% female [$P < .05$]; and victims: 52.9% male vs 47.8% female [$P = .34$]).

ADULT OUTCOMES

Of the 1420 participants assessed in childhood, 1273 (89.7%) were followed up in young adulthood. Follow-up rates were similar across bully-victim groups (bullies: 100 of 112 [89.3%]; victims: 305 of 335 [91.0%]; bullies/victims: 79 of 86 [91.9%]; and neither: 789 of 887 [89.0%]), with no differences in follow-up rates between the "neither" group and any of the 3 bully-victim groups (neither vs bullies, $P = .39$; neither vs victims, $P = .95$; and neither vs bullies/victims, $P = .93$).

Both groups of victims (ie, victims and bullies/victims) were at risk for young adult psychiatric disorders compared with those with no history of bullying or being bullied (Table 1). Columns 2 through 5 in Table 1 show the rates of young adult psychiatric outcomes by childhood bully-victim status. The remaining columns compare the odds for each of the bully-victim groups with the odds of those that were neither bullied nor bullied others. Those who were only victims had higher levels of depressive disorders, anxiety disorders, generalized anxiety, panic disorder, and agoraphobia, whereas those who were both bullies and victims (bullies/victims) had higher levels of all anxiety and depressive disorders. Bully/victims also had the highest levels of suicidality, with 24.8% reporting suicidality in young adulthood compared with 5.7% of those in the "neither" group. Bullies/victims also reported the highest levels of depressive disorders (21.5% in the bully/victim group vs 3.3% in "neither" group), generalized anxiety (13.6% in the bully/victim group vs 3.1% in "neither" group), and panic disorder (38.4% in the bully/victim group vs 4.6% in "neither" group). Bullies were at increased risk for antisocial

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Table 3. Associations Between Bully-Victim Groups and Young Adult Psychiatric Outcomes Accounting for Childhood Psychiatric Disorders and Family Hardships[a]

	Victim vs Neither		Bully/Victim vs Neither		Bully vs Neither	
Outcome	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
Depressive disorders	2.3 (0.8-6.2)	.11	**4.8 (1.2-19.4)**	**.03**	0.7 (0.2-2.2)	.51
Suicidality	1.2 (0.4-3.3)	.78	F: 0.6 (0.1-3.9); **M: 18.5 (6.2-55.1)**	F: .56; **M: <.001**	0.4 (0.1-1.7)	.21
Anxiety disorders	**4.3 (2.1-8.6)**	**<.001**	2.3 (0.7-7.3)	.17	1.1 (0.4-3.0)	.80
Generalized anxiety disorder	**2.7 (1.1-6.3)**	**.02**	F: 1.8 (0.3-11.3); M: 0.4 (0.1-2.4)	F: .54; M: .34	1.1 (0.3-3.9)	.83
Panic disorder	**3.1 (1.5-6.5)**	**.003**	**14.5 (5.7-36.6)**	**<.001**	1.6 (0.5-4.8)	.44
Agoraphobia	**4.6 (1.7-12.5)**	**.003**	**F: 26.7 (4.3-52.5)**; M: 0.8 (0.1-10.6)	**F: <.001**; M: .85	1.9 (0.5-6.9)	.32
Antisocial personality disorder	0.3 (0.1-1.4)	.11	2.4 (0.5-9.3)	.22	**4.1 (1.1-15.8)**	**.04**
Alcohol disorders	F: 2.6 (0.5-12.4); M: 0.6 (0.3-1.2)	F: .12; M: .12	0.7 (0.2-2.6)	.62	1.5 (0.6-3.3)	.38
Marijuana disorder	F: 3.1 (0.9-10.0); M: 0.5 (0.3-1.2)	F: .06; M: .11	0.3 (0.1-1.1)	.06	1.2 (0.5-2.7)	.71

Abbreviation: OR, odds ratio.

[a] Participants were categorized as bullies only, victims only, bullies and victims (hereafter referred to as bullies/victims), or neither. The ORs and 95% CIs in bold are significant at $P < .05$. If there was a significant sex × bully status interaction, the results are presented separately for males (M) and females (F). The significant covariates are available on request from the first author.

personality disorder, with 9.4% meeting full criteria in young adulthood compared with 2.1% in the "neither" group. None of the groups had elevated levels of substance use disorders compared with those who had not been bullied or bullied others.

CHILDHOOD PSYCHIATRIC DISORDERS AND FAMILY HARDSHIPS

Table 2 shows the relationships between group status and childhood psychiatric diagnoses and family hardships. These factors may have occurred either before or after the child was first bullied or first bullied others. The findings are consistent with previous research in suggesting widespread psychiatric problems and social/family hardships for victims and bullies/victims.[12] Bullies looked similar to bully/victims, with high levels of disruptive behavior disorders and family hardships, but they were not significantly elevated for emotional disorders. Suicidality was higher in childhood for all victim groups (ie, victims and bullies/victims).

LONG-TERM OUTCOMES AFTER ADJUSTMENT FOR CHILDHOOD FACTORS

We tested whether the adverse long-term psychiatric outcomes observed were direct effects or better accounted for by childhood psychiatric and family hardships. All models were also tested for differences by sex.

The results of the multivariable models are provided in Table 3. Victims of bullying continued to be at risk for all anxiety disorders in models adjusted for childhood psychiatric status and hardships, but the association with depressive disorders was attenuated and no longer statistically significant. There were sex differences in victims' risk for substance disorders, although the increased risk for female victims in both cases fell below common statistical thresholds. Bullies/victims continued to be at significant risk for depressive disorders and for panic disorder after the inclusion of covariates. There was also evidence of sex-specific risk, with male participants at 18.5 times the odds for suicidality and female participants at 26.7 times the odds for agoraphobia compared with the "neither" group. The risk for generalized anxiety and overall anxiety disorders were no longer significant for bullies/victims. As in the unadjusted models, bullies were not at increased risk for either anxiety or depressive disorders, but they continued to be at risk for antisocial personality disorder. Across all adjusted models, childhood psychiatric variables and hardships were associated with later psychiatric problems.

The models in Table 3 were adjusted for childhood psychiatric status and hardships at any point in childhood or adolescence. As such, these covariates could be confounders of the association between bully-victim status and later psychiatric problems if they occurred prior to being bullied or bullying others, or they could be potential mediators if they occurred subsequent to being bullied or bullying others. To provide a robust test of confounding, all models in Table 3 were rerun, including only psychiatric disorder and family hardships that had occurred prior to being bullied or bullying others. This reanalysis did not change the pattern of finding from Table 3 in any way.

The repeated assessments of bullying involvement across childhood and adolescence allowed us to address

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the issue of chronicity. Were the long-term effects worse for those who had been involved in bullying either as a bully, a victim, or both at multiple time points? To test this, we limited the analysis to those who had participated in at least 3 observations in childhood or adolescence (n = 1180) and then tested a continuous measure of the total number of assessments with bullying involvement as opposed to the dichotomous variable used previously. Across all groups, a substantial percentage (>25%) of individuals reported involvement at multiple assessments. All adjusted models in Table 3 were retested. In terms of statistical significance, the results mirrored those previously obtained, with 2 exceptions: risk for marijuana disorder among female victims was significant ($P = .04$), and risk for depressive disorders among bullies/victims fell below the common significance threshold ($P = .06$). There were similar results if repeated involvement was defined as occurring in both childhood (9-13 years) and adolescence (14-16 years).

COMMENT

To our knowledge, this is the first study to explore prospectively the association between peer victimization in childhood and adult psychiatric diagnoses and suicidality. Victims of bullying in childhood were at increased risk of anxiety disorders in adulthood, and those who were both victims and perpetrators were at increased risk of adult depression and panic disorder. Female bullies/victims were at risk for agoraphobia, and male bullies/victims were at increased risk for suicidality. These effects were maintained even after accounting for preexisting psychiatric problems or family hardships. This suggests that the effects of victimization by peers on long-term adverse psychiatric outcomes are not confounded by other childhood factors. Although deviant in childhood, bullies were only at risk for antisocial personality disorder in adulthood.

Victims and bullies/victims differed from children not involved in bullying in their family background and in their childhood psychological functioning. This is consistent with profiles found in other studies in which victims are described as withdrawn, unassertive, easily emotionally upset, and as having poor emotional or social understanding,[27] whereas bullies/victims tend to be aggressive, easily angered, and frequently bullied by their siblings.[12,28] As such, bullies/victims have few friends who would stand up for them; they are the henchmen or reinforcers for the bullies and the most troubled children.[29,30]

This pattern has been interpreted to suggest that victimization occurs within a context of other risk factors and may not be causal in predicting later outcomes in and of itself. This hypothesis has received some support in the only previous child-to-adulthood study of bullying,[17] in which the risk for psychiatric hospitalization or depression 5 to 15 years later in frequent victims and bullies/victims was eradicated for boys and attenuated for girls after controlling for prior psychopathology.[15] Suicidal ideation was the primary outcome for which there was some evidence of unattenuated direct effects of victimization,[16] but, again, only for girls. The Finnish study,[13,14] however, relied on questionnaires completed at one time point, or on registries, whereas the present study used structured interviews administered multiple times in young adulthood. In our study, the long-term effects were maintained even after accounting for all common childhood psychiatric disorders and a range of family hardships, and they were generally similar for male and female victims or bullies. Contrary to the previous Finnish study,[13,14] we did not find girls more often traumatized by bullying; rather, both males and females are equally adversely affected by peer victimization. Similarly, both male and female bullies/victims were at highly increased risk for depression. This provides strong evidence that being a victim of bullying or being both a victim and a perpetrator is a risk factor for serious emotional problems for both males and females, independent of preexisting problems. However, only male bullies/victims reported suicidality more often, whereas female bullies/victims reported agoraphobia more often in early adulthood, indicating different tendencies by the sexes of dealing with distress caused by being a bully/victim. Furthermore, being a bully increases the risk of antisocial personality disorder over and above disruptive behavior disorder in childhood or family hardship. A recent meta-analysis supports that bullying perpetration increases the risk of later offending.[11] Our study adds that the risk of antisocial personality disorder is increased in both male and female bullies, but not in those who both bully and become victims.

How does being victimized lead to emotional disorders and suicidality? This may occur by altering the physiological response to stress, by affecting the telomere length or the epigenome, by interacting with a genetic vulnerability to emotional disorders, or by changing cognitive responses to threatening situations. For example, victimization has been found to alter activity in the hypothalamic-pituitary-adrenal axis,[31] and an altered cortisol response is associated with an increased risk for developing depression.[32] Recently, erosion of the length of telomeres, the repetitive TTAGGG sequence at the end of linear chromosomes, has emerged as a promising new biomarker of stress. Accelerated erosion has been found in children exposed to violence (such as bullying, domestic violence, or physical maltreatment).[33] Evidence for a gene × environment interaction by variation in the serotonin transporter gene of children exposed to bullying has also been demonstrated.[34] Furthermore, peer rejection has been repeatedly reported to lead to a negative emotional reaction and, depending on depression status, to avoidant coping behavior.[35] Each of these aspects of stress response should be targets for future research efforts.

The strengths of the present study are (1) the prospective study design, with repeated assessments during childhood/adolescence and early adulthood; (2) the use of multiple informants for a combined measure of peer victimization; (3) a population-based design that minimized selection biases; and (4) the availability of information on a variety of social/family factors and precurrent or concurrent psychiatric disorders to control for confounding. Finally, the prevalence rates of peer victimization are similar to those reported in other similar studies.[36]

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Not all participants were interviewed at every assessment, but response rate have remained high (>80%) over almost 20 years, and there was no evidence of selective dropout for victims or bullies. The current sample is representative of children from the area sampled but not of children in the United States. The focus of this analysis was bullying in the school setting, but bullying also occurs at home and in the community. It is not clear if bullying in other settings has similar long-term effects.[37] Furthermore, we had an overall assessment of bullying and could not distinguish between overt and relational bullying, which may affect males and females differently.[38] Finally, our study provides strong evidence of the effects of bullying on suicidality in general, but we were unable to parse effects on specific aspects of suicidality (eg, attempts) owing to the rarity of these behaviors in this community sample.

Bullying is not just a harmless rite of passage or an inevitable part of growing up. Victims of bullying are at increased risk for emotional disorders in adulthood. Bullies/victims are at highest risk and are most likely to think about or plan suicide. These problems are associated with great emotional and financial costs to society.[7] Bullying can be easily assessed and monitored by health professionals and school personnel, and effective interventions that reduce victimization are available.[39] Such interventions are likely to reduce human suffering and long-term health costs and provide a safer environment for children to grow up in.

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