

RESEARCH ARTICLE

Mental Health Service Use Among High School Students Exposed to Interpersonal Violence

JENNIFER Greif GREEN, PhD^a RENEE M. JOHNSON, PhD, MPH^b ERIN C. DUNN, ScD, MPH^c MICHAEL A. LINDSEY, PhD, MSW, MPH^d
ZIMING XUAN, ScD, SM^e ALAN M. ZASLAVSKY, PhD^f

ABSTRACT

BACKGROUND: Violence-exposed youth rarely receive mental health services, even though exposure increases risk for academic and psychosocial problems. This study examines the association between violence exposure and mental health service contact. The 4 forms of violence exposure were peer, family, sexual, and witnessing.

METHODS: Data are from 1534 Boston public high school students who participated in a 2008 self-report survey of violence exposure and its correlates. Multivariate logistic regressions estimated associations between each form of violence with service contact, then examined whether associations persisted when controlling for suicidality and self-injurious behaviors.

RESULTS: In unadjusted models, violence-exposed students more often reported service contact than their peers. However, in multivariate models, only exposure to family (odds ratio [OR] = 1.69, 95% confidence interval [CI] = 1.23-2.31) and sexual violence (OR = 2.34, 95% CI = 1.29-4.20) were associated with service contact. Associations attenuated when controlling for suicidality and self-injurious behaviors, indicating they were largely explained by self-harm. Sexual violence alone remained associated with mental health service contact in fully adjusted models, but only for girls (OR = 3.32, 95% CI = 1.30-8.45), suggesting sex-specific pathways.

CONCLUSIONS: Associations between adolescent violence exposure and mental health service contact vary by forms of exposure. Outreach to a broader set of exposed youth may reduce the impact of violence and its consequences for vulnerable students.

Keywords: adolescents; mental health; service use; suicide; victimization; violence.

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Consistent evidence indicates that youth exposed to violence are more likely than their nonexposed peers to develop mental disorders.¹⁻⁴ However, few studies have examined whether those exposed to violence are more or less likely to receive mental health services. To date, the small number of studies that have examined this association have found that students exposed to violence often do not receive mental health services.^{5,6} Further, after controlling for background variables and psychological symptoms, violence victimization may even be associated with *decreased* odds of receiving mental health services.⁵ This pattern is concerning and highlights a missed

opportunity for prevention, given that mental health services can reduce the psychological impact of violence, allows youth to be monitored for the onset of symptoms, and prevents the onset of subsequent comorbid disorders among those with existing psychological disorders.^{7,8}

Prior studies have tested composite indices of violence exposure, reflecting either any violence exposure,⁵ or number of violence exposures.⁶ However, there is reason to expect that different forms of violence exposure may be differentially associated with mental health service use. First, several recent studies have documented that some forms of exposure to violence, particularly family violence, are more

^aAssistant Professor, (jgreen@bu.edu), Boston University School of Education, 2 Silber Way, Boston, MA 02215.

^bAssistant Professor, (rejohnso@jhsph.edu), Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, 624 North Broadway, 8th Floor, Baltimore, MD 21205.

^cPostdoctoral Research Fellow, (erindunn@pngu.mgh.harvard.edu), Center for Human Genetic Research, Psychiatric and Neurodevelopmental Genetics Unit, Massachusetts General Hospital, Richard B. Simches Research Center, 185 Cambridge St., Boston, MA 02114.

strongly associated with the onset and persistence of psychological disorders than others.⁹⁻¹¹ Second, different forms of violence exposure can vary in how observable they are to the adults who are likely to initiate mental health services. For example, peer aggression may be observable by adults at school, whereas family violence may be concealed. Third, adolescents are more likely to report some forms of violence than others to adults in helping roles.¹² Finally, some forms of violence—sexual violence in particular—are more likely to lead to mental health service referral than others, as they are more widely recognized as having a negative impact on psychological adjustment.¹³ More clearly delineating the associations of different forms of violence exposure and mental health service use could contribute to improved school-based outreach and service provision for vulnerable students.

Further, there are well-documented demographic differences related to both violence exposure and likelihood of mental health service contact. In particular, boys typically report higher rates of physical violence or witnessing violence, while girls more often report sexual violence.^{14,15} Prior studies have also documented that boys are more likely to receive mental health services than girls,^{16,17} although these associations vary by level of impairment and the type of disorder precipitating services.^{17,18} Sex also has been found to moderate the association between violence exposure and mental health outcomes, which in turn, may influence likelihood of mental health service receipt.^{14,19} However, prior studies have not specifically addressed the role of sex as a potential moderator in the relationship between violence exposure and mental health service use.

This study sought to address shortcomings in the literature by examining associations between several forms of violence exposure and mental health service contact. Data come from a sample of students attending Boston public high schools. First, we examine the associations between each of 4 forms of violence exposure and mental health service contact. Second, we examine whether students reporting multiple forms of violence exposure more often report a mental health service contact. Third, we test whether

these associations are explained by suicidality and self-injurious behaviors, 2 notable mental health consequences of violence exposure. Finally, to determine whether there are sex differences in associations of specific forms of violence exposure and mental health service contact, we conduct stratified analyses by sex.

METHODS

Participants

Data are from the 2008 Boston Youth Survey (BYS). The BYS is a survey of high school students (9th-12th graders) in the Boston Public Schools (BPS) administered by the Harvard Youth Violence Prevention Center.²⁰ The BPS student population is predominately minority and low-income; 42% are Latino, 35% are black, 78% are eligible for free or reduced-price meals in school, and 53% are eligible for food stamps.²¹

The BYS 2008 assesses a range of topics, including demographics, health behaviors, and substance use. It particularly focuses on violence, in terms of victimization, perpetration, and witnessing. Thirty-two eligible public high schools within the BPS system were invited to participate in the BYS. Schools that were considered ineligible for participation were those serving (1) adults, (2) students with significant disabilities, and (3) students transitioning back to school after incarceration or suspension. Twenty-two eligible schools participated, resulting in a school participation rate of 68%. Among schools considered eligible, there were no statistically significant differences between participating and nonparticipating schools in key school indicators, such as dropout rates, composition of students, and standardized test scores.

Within the participating schools, a list of unique humanities classrooms was generated. Classrooms were stratified by grade and selected randomly for survey administration. Every student within selected classrooms was invited to participate. Classroom selection continued until approximately 100-125 students per school were surveyed. At 2 schools with total enrollments close to 100, all classrooms were invited to participate.

^dAssociate Professor, (michael.lindsey@nyu.edu), Silver School of Social Work, New York University, 1 Washington Square North, New York, NY 10003.

^eResearch Assistant Professor, (zquan@bu.edu), Department of Community Health Sciences, Boston University School of Public Health, 801 Massachusetts Ave., Third Floor, Boston, MA 02118.

^fProfessor, (zaslavsky@hcp.med.harvard.edu), Department of Health Care Policy, Harvard Medical School, 180 Longwood Ave., Boston, MA 02115.

Address correspondence to: Jennifer Greif Green, Assistant Professor, (jggreen@bu.edu), Boston University School of Education, 2 Silber Way, Boston, MA 02215.

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Procedure

The BYS was administered in paper-and-pencil format by trained research staff between January and April 2008. Prior to administration, passive consent was sought from parents. Specifically, parents were notified of the survey and not required to respond if they approved their child's participation. Informed assent was obtained from students. Of the 2725 students enrolled in selected classrooms, 1878 completed the survey (69%). Students who did not complete a survey either (1) chose not to participate ($N = 99$), (2) did not have parental consent ($N = 24$), or (3) were absent on the day of administration ($N = 724$).

Instruments

Violence exposure. The BYS included 16 questions assessing 4 forms of interpersonal violence exposure in the past year. All questions had a yes/no response set. The research team developed questions about peer and family violence based on items from the physical assault scale of the Revised Conflict Tactics Scales.²² Peer violence was measured with 4 questions asking respondents about victimization by other adolescents. Respondents were specifically asked to think about their peers, and to exclude family members. Peer violence included having been (1) punched, kicked, choked, or beaten up; (2) attacked or threatened with a weapon other than a gun; (3) the target of a "gun display"; and (4) shot at or shot with a gun. Having been the target of a gun display indicated that someone showed the young person a gun for the purpose of scaring him or her, or to force him or her to do something.

Family violence was measured with 6 questions asking the respondent about being assaulted by a caregiver. Acts of violence included having been (1) pushed, grabbed, or shoved; (2) kicked, bitten, or punched; (3) hit with something that could hurt; (4) choked or burned; (5) attacked or threatened with a weapon, such as a knife or bat; or (6) physically attacked in some other way.

The BYS research team developed items pertaining to sexual violence and witnessing violence. Sexual violence was assessed with a single question asking whether respondents had been forced to have sex. The instructions indicated that the perpetrator could have been anyone, and the assault could have occurred anywhere.

Witnessing violence was assessed with 4 questions asking whether students had observed someone else being assaulted in real life. It included having seen someone else being (1) attacked or threatened with a weapon other than a gun, (2) threatened with a gun, (3) shot at or shot, or (4) murdered.

A tetrachoric factor analysis (promax rotation) with these 16 items resulted in 3 factors with eigenvalues

greater than 1 (unrotated eigenvalues = 7.10, 3.47, 1.44, and 0.90) corresponding to 3 of the item groups described above: family violence, witnessing violence, and peer violence. Results are available on request. Although the sexual violence item loaded with the family violence factor, we maintained it as an independent indicator because it had the lowest loading on this factor and is conceptually distinct. For each factor, we created a dichotomous variable indicating endorsement of any violence: that is, any peer violence, any family violence, and any witnessing violence.

Mental health contact. Contact with a mental health provider was assessed with a single item: "In the past 12 months, did you visit a school counselor, therapist, or psychologist because you were feeling bad or were having some emotional problems?" This question was intended to assess a broad range of mental health service contacts both in and out of school.

Suicidality and self-injurious behaviors. Two items asked if in the past year respondents (1) seriously considered attempting suicide or (2) cut or otherwise injured themselves on purpose.

Sociodemographics. BYS respondents indicated their sex, grade level (9th-12th), and race/ethnicity. Race/ethnicity was coded as non-Latino white, non-Latino black, Latino, Asian, and other.

Data Analysis

Analyses were restricted to participants with complete information on demographics, exposure to violence, and mental health contact ($N = 1534$). We examined associations between violence, suicidality/self-injurious behaviors, and mental health contact by constructing a series of logistic regression models. In the first series of models, we examined the bivariate associations between each of the 4 forms of violence exposure separately and mental health contact, controlling for sex, grade, and race/ethnicity. In a second model, we examined the multivariate association of each of the 4 forms of violence simultaneously and mental health service contact, controlling for demographic variables. By entering all 4 forms of violence together in a single model, we were able to account for the co-occurrence of these forms of violence involvement and determine the unique contribution of each form of violence to mental health service contact. In a third model, we added dummy variables indicating number of forms of victimization, specifically: exactly 1 form, exactly 2 forms, exactly 3 forms, and all 4 forms. This allowed us to determine whether the odds of mental health contact increased among students reporting exposure to multiple forms of violence. Fourth, we estimated a model that included the 4 forms of violence exposure,

Table 1. Tetrachoric Correlations of Variables Indicating Mental Health Service Contact, Violence Exposure, Suicidality, and Self-Injurious Behaviors (N = 1534)

	Mental Health Service Contact	Peer Violence	Family Violence	Sexual Violence	Witnessing Violence	Suicidality	Self-Injurious Behaviors
Mental health service contact	1.00						
Peer violence	0.04	1.00					
Family violence	0.22	0.38	1.00				
Sexual violence	0.27	0.31	0.41	1.00			
Witnessing violence	0.09	0.46	0.30	0.25	1.00		
Suicidality	0.44	0.25	0.47	0.43	0.13	1.00	
Self-injurious behaviors	0.45	0.10	0.45	0.37	0.19	0.75	1.00

number of violence exposures, and suicidality/self-injurious behaviors as predictors of mental health service contact. We reran the final model, stratified by sex, to observe differences in associations between violence exposure and mental health service contact for boys and girls. Analyses were conducted using PROC GLIMMIX, SAS, version 9.2 (SAS Institute Inc., Cary, NC), a multilevel modeling procedure that accounted for the clustering of students in schools. We report adjusted odds ratios (ORs) and 95% confidence intervals (CIs).

RESULTS

Violence Exposure

More than one-half (56.9%) of students reported at least 1 form of violence exposure in the past year. The most frequently reported form of violence was witnessing violence (45.5%), followed by peer violence (21.8%), family violence (17.1%), and sexual violence (3.4%). These forms of violence exposure were co-occurring, with only 33.1% of the total sample reporting exactly one form of exposure. By contrast, 17.5% reported 2, 5.4% reported 3, and 0.9% reported all 4 forms of violence exposure. Forms of violence exposure were positively and moderately correlated with one another ($r = 0.25-0.46$, Table 1).

Mental Health Contact

Less than one fourth (22.8%) of respondents had a past-year mental health service contact. There were no statistically significant differences in the prevalence of a mental health service contact by race/ethnicity or grade level. Girls reporting suicidal ideation and those who reported self-injurious behaviors were significantly more likely to have had a mental health service contact (Table 2). Youth who reported family violence, sexual violence, and witnessing violence were also significantly more likely than their nonexposed peers to have had a mental health service contact ($\chi^2 = 3.92-19.65$, all $p < .05$). However, youth victims of peer violence were no more likely to report a mental health service contact (24.2%) than those reporting no peer violence (22.3%).

Association Between Violence Exposure and Mental Health Contact

In bivariate models, where each form of violence was considered separately, family violence, sexual violence, and witnessed violence were all significantly and positively associated with mental health contact. The strongest OR was for sexual violence (OR = 2.84, 95% CI = 1.60-5.05), suggesting that youth exposed to sexual violence had 2.84 times the odds of having mental health contact when compared with youth who did not report sexual violence (Table 3). The magnitude of the ORs attenuated in a multivariate model in which all 4 forms of violence exposure were entered simultaneously. This indicates that associations were partially accounted for by co-occurring forms of violence. Only family violence (OR = 1.69, 95% CI = 1.23-2.31) and sexual violence (OR = 2.33, 95% CI = 1.29-4.20) remained statistically significant in this multivariate model.

When we tested the association of number of different forms of violence exposure and mental health service use, we found that youth exposed to a greater number of different forms of violence were more likely to have a mental health contact (OR = 1.31 for exactly one form of violence exposure, OR = 2.55 for all 4 forms of violence exposure). However, when we examined each of the 4 forms of violence exposure simultaneously, along with the number of different forms of violence exposure as predictors of service use, we found that the variables indicating number of forms were no longer statistically significant but the individual forms of violence were statistically significant. This suggests that the effects of forms of violence are cumulative, that is, additive on the logit scale of the model. Here, only family violence (OR = 1.80, 95% CI = 1.13-2.85) and sexual violence (OR = 3.01, 95% CI = 1.43-6.37) remained statistically significant in their association with mental health service contact.

Further, we examined the extent to which suicidal ideation/ self-injurious behaviors contributed to explaining the association of form and number of violence exposures and mental health service contact. Both were significantly associated with mental health contact. The only form of violence that remained

Table 2. Description of Sample Prevalences, and Among Those in Each Sample Category, Percentage Who Reported Mental Health Contact in the Last Year (N = 1534)

	Prevalence	Percentage With Mental Health Contact
Sex		
Boys	44.9	16.7
Girls	55.1	27.7
χ^2		26.1*
Race/ethnicity		
White	9.5	21.4
Black	42.4	21.1
Latino	33.2	25.7
Asian	8.3	21.1
Other	6.7	22.6
χ^2		4.0
Grade		
9th	24.3	19.1
10th	27.9	23.1
11th	26.3	25.0
12th	21.5	23.6
χ^2		4.2
Suicidality		
Yes	11.8	49.2
No	88.2	19.2
χ^2		81.5*
Self-injurious behaviors		
Yes	8.2	54.0
No	91.8	20.0
χ^2		76.1*
Victim of peer violence		
Yes	21.8	24.2
No	78.2	22.3
χ^2		0.5
Victim of sexual assault		
Yes	3.4	44.2
No	96.6	22.0
χ^2		14.1*
Victim of family violence		
Yes	17.1	33.2
No	82.9	20.6
χ^2_1		19.7*
Witnessed violence		
Yes	45.5	25.1
No	54.5	20.8
χ^2		3.9*
Number of forms of violence		
0	43.1	19.1
1	33.1	23.2
2	17.5	26.4
3	5.4	36.1
4	0.9	30.8
χ^2		16.2*

*p < .05 based on a 2-tailed chi-square test of significance.

significantly associated with mental health contact after controlling for suicidal ideation and self-injurious behaviors was sexual violence (OR = 2.53, 95% CI = 1.14-5.63, Table 3). The OR for family violence attenuated, indicating that its significant association

with mental health service use was largely mediated by suicidal ideation and self-injurious behaviors.

As girls in this sample had significantly higher odds of mental health service contact than boys (OR = 1.67, 95% CI = 1.27-2.19), we repeated the final model stratified by sex (Table 4). For boys, only self-injurious behavior was significantly associated with mental health contact (OR = 2.46, 95% CI = 1.06-5.72). For girls, indicators of suicidal ideation and self-injurious behaviors were both significantly associated with mental health service contact (ORs = 2.56-2.82), as was sexual violence (OR = 3.32, 95% CI = 1.30-8.45).

DISCUSSION

We set out to examine the association between 4 forms of violence exposure and mental health service contact among Boston public high school students participating in the BYS. We found that the majority of students in our sample reported exposure to violence. More than three-fourths reported at least 1 form of violence in the past year. These numbers are higher than those reported in national samples,¹⁵ but are consistent with those reported by other studies of youth living in low-income urban areas,^{2,23} reiterating the strong presence of violence in the lives of urban adolescents. As with prior studies, different forms of violence were interrelated: 41.8% of youth who reported exposure to any violence indicated having been exposed to more than 1 form.²⁴⁻²⁶

Approximately one-fifth of all students reported past-year contact with a mental health professional and the likelihood of having a mental health contact varied by mental health need and violence exposure. However, even among students reporting serious suicidal ideation, less than one-half had contact with a mental health provider. These findings are consistent with national data suggesting that large numbers of youth with a need for mental health services do not receive those services.^{16,27,28} Youth reporting exposure to violence had similarly low rates of mental health service contact, ranging from 24.2% for victims of peer violence to only 44.2% for victims of sexual violence. This indicates that the needs of BYS participants exposed to violence are also inadequately met.⁵

Although family violence, sexual violence, and witnessing violence were significantly associated with service contact in bivariate analyses, these associations notably attenuated in multivariate analyses, a finding that reflects the degree to which multiple forms of violence co-occur.²⁶ Consistent with literature on the psychological outcomes of childhood adversities,^{4,10,29} this finding suggests that studies focused on a single form of violence exposure—for example witnessing violence—but failing to account for multiple exposures may overestimate associations between specific forms of violence and mental health

Table 3. Bivariate and Multivariate Associations of Violence Exposure and Suicidal Ideation/Self-Injurious Behaviors With Mental Health Service Contact (N = 1534)

	Bivariate [†]		Multivariate [‡] All Forms of Violence Exposure		Multivariate [‡] Forms and Number of Violence Exposure		Multivariate [‡] Forms and Number of Violence and Suicide/Self-Injury	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex								
Boys			—	—	—	—	—	—
Girls			1.89*	(1.45-2.47)	1.87*	(1.43-2.44)	1.67*	(1.27-2.19)
Race/ethnicity								
White			—	—	—	—	—	—
Black			0.85	(0.54-1.35)	0.86	(0.54-1.36)	0.91	(0.57-1.47)
Latino			1.15	(0.73-1.83)	1.16	(0.73-1.85)	1.18	(0.73-1.91)
Asian			0.95	(0.52-1.74)	0.98	(0.53-1.78)	1.07	(0.57-1.98)
Other			0.81	(0.43-1.53)	0.82	(0.43-1.54)	0.76	(0.39-1.49)
Grade								
9th			—	—	—	—	—	—
10th			1.37	(0.96-1.96)	1.36	(0.95-1.94)	1.32	(0.91-1.90)
11th			1.51*	(1.05-2.16)	1.50*	(1.05-2.15)	1.55*	(1.07-2.25)
12th			1.47	(1.00-2.15)	1.47*	(1.00-2.14)	1.48*	(1.00-2.19)
Forms of violence exposure								
Peer violence	1.30	(0.96-1.75)	1.05	(0.76-1.44)	1.12	(0.68-1.85)	1.14	(0.68-1.91)
Family violence	1.87*	(1.38-2.52)	1.69*	(1.23-2.31)	1.80*	(1.13-2.85)	1.41	(0.87-2.30)
Sexual violence	2.84*	(1.60-5.05)	2.33*	(1.29-4.20)	3.01*	(1.43-6.37)	2.53*	(1.14-5.63)
Witnessing violence	1.31*	(1.02-1.69)	1.19	(0.91-1.54)	1.22	(0.89-1.68)	1.24	(0.90-1.71)
Number of violence exposures								
1 form	1.31	(0.98-1.76)			— [§]	—	— [§]	—
2 forms	1.64*	(1.16-2.32)			0.92	(0.51-1.66)	0.79	(0.43-1.45)
3 forms	2.69*	(1.62-4.48)			0.92	(0.34-2.50)	0.82	(0.29-2.30)
4 forms	2.55	(0.75-8.64)			0.34	(0.05-2.06)	0.23	(0.03-1.55)
Mental health consequences								
Suicidal ideation	3.89*	(2.79-5.41)					2.54*	(1.73-3.72)
Self-injurious behaviors	4.35*	(2.96-6.40)					2.50*	(1.61-3.89)

CI, confidence interval; OR, odds ratio.

* $p < .05$.

[†]In bivariate models, each form of violence exposure is added to the model on its own. Forms of violence exposure and suicidal ideation/self-injurious behaviors are each entered individually. Number of violence exposures is entered as a “set” — meaning they were entered simultaneously into a model. All models control for gender, grade, and race/ethnicity.

[‡]In multivariate models, all predictors are added to the model simultaneously.

[§]Exactly 1 violence exposure is not included in multivariate models with forms of violence exposure, because this coefficient is perfectly explained by the coefficients of the four forms of violence exposure.

service contact. Prior research found that youth reporting a greater number of forms of violence were more likely to access mental health services.⁶ Our finding suggests that the joint effect of multiple forms of youth violence exposure is better understood as a cumulative effect rather than as an effect of the number of forms of violence.

Mental health service contact was most powerfully associated with exposure to family and sexual violence. These forms of interpersonal violence have previously been identified as particularly powerful predictors of psychiatric disorders.^{9,10} Hence, our finding suggests that BYS youth at greatest risk for the mental health consequences of violence are, appropriately, the most likely to be connected with services. These associations appeared to be at least partially mediated by suicidal ideation and self-injurious behaviors, 2 important mental health indicators. Sexual violence, alone,

continued to be significantly associated with mental health service use in fully adjusted models, indicating that it has the strongest independent association with service contact. Literature from studies of child welfare similarly suggests that youth exposed to sexual violence are the most likely to be referred for evaluation and treatment, because of the seriousness with which these reports are considered.³⁰

Interestingly, peer violence victimization was not associated with mental health service contact, even in bivariate analyses. Importantly, our measures of peer violence were quite severe, including serious physical assault and gun displays. The lack of association could be due to the fact that violence has become somewhat normalized in urban areas, or that students involved in peer violence are sometimes viewed as “troubling” rather than “troubled,” and are less likely to be referred for mental health services.³¹ By contrast,

Table 4. Multivariate Associations of Violence Exposure and Suicidal Ideation/Self-Injurious Behaviors With Mental Health Service Contact, Stratified by Sex[†]

	Boys (N = 689)		Girls (N = 845)	
	OR	95% CI	OR	95% CI
Race/ethnicity				
White	—	—	—	—
Black	1.06	(0.53-2.11)	0.81	(0.42-1.58)
Latino	0.82	(0.40-1.69)	1.40	(0.72-2.73)
Asian	1.12	(0.44-2.88)	1.05	(0.46-2.42)
Other	0.80	(0.24-2.64)	0.76	(0.33-1.77)
Grade				
9th	—	—	—	—
10th	1.05	(0.57-1.93)	1.57	(0.97-2.55)
11th	1.92*	(1.07-3.44)	1.38	(0.85-2.25)
12th	1.37	(0.71-2.63)	1.63	(0.98-2.69)
Forms of violence exposure				
Peer violence	0.92	(0.39-2.16)	1.25	(0.63-2.48)
Family violence	1.73	(0.67-4.46)	1.20	(0.67-2.15)
Sexual violence	0.54	(0.05-5.63)	3.32*	(1.30-8.45)
Witnessing violence	1.56	(0.92-2.65)	1.10	(0.72-1.66)
Number of violence exposures				
1 form	— [‡]	—	— [‡]	—
2 forms	0.71	(0.25-2.02)	1.00	(0.46-2.17)
3 forms	0.87	(0.15-5.00)	0.76	(0.20-2.98)
4 forms	1.28	(0.04-44.90)	0.12	(0.01-2.49)
Mental health consequences				
Suicidal ideation	2.03	(0.99-4.17)	2.82*	(1.77-4.50)
Self-injurious behaviors	2.46*	(1.06-5.72)	2.56*	(1.51-4.36)

CI, confidence interval; OR, odds ratio.

* $p < .05$.

[†]All predictors are added to the model simultaneously.

[‡]Exactly 1 violence exposure is not included in multivariate models with forms of violence exposure, because this coefficient is perfectly explained by the coefficients of the 4 forms of violence exposure.

the finding that victims of sexual assault receive services is encouraging. However, the high frequency of physical assault by peers remains concerning, given our observation that many of these youth receive no mental health services. These findings signal the need to ensure that victims of peer violence receive support. Finally, in stratified analyses by gender, associations of sexual violence and mental health service contact remained significant for girls. However, for boys, only self-injurious behavior was significantly associated with mental health service contact. This result, coupled with the finding that girls in this sample were more likely to have a mental health contact than boys, in general, suggests more direct pathways to enter services for girls than boys with violence exposure. Results may reflect differences in the perceptions of boys' versus girls' exposure to sexual violence, or that girls more effectively elicited help-seeking mechanisms than males.

Limitations

Findings should be interpreted in light of several study limitations. First, the BYS uses a sample of youth

attending Boston public high schools. Findings may not be able to be generalized to students attending nonparticipating BPS or schools in other populations. Second, mental health service contact was assessed using a broadly stated question about visiting a school counselor, therapist, or psychologist. Although this question was intended to assess a range of mental health service contacts, it is unclear whether, in the context of this school-based survey, students were primarily referencing contacts with school-based providers. Further, the BYS does not include information about the nature of contact with this provider, including who initiated contact, duration of treatment, or its quality and frequency. For example, although 23% of students reported having seen a provider, it is possible that a much smaller proportion of these youth received ongoing services. Third, because the assessment of mental health need included only suicidal ideation and self-injurious behavior we were unable to examine a broader range of emotional problems that may elicit mental health services. This limitation would lead us to overestimate the direct association (unmediated by mental health status) between violence involvement and mental health contact, suggesting that such associations may be even smaller than those reported here. Fourth, the BYS did not ask students about their insurance or socio-economic status, factors known to be associated with mental health service access. Fifth, data are cross-sectional and do not establish a temporal association between exposure to violence and mental health contact. Finally, data are based solely on adolescent self-reports that may under- or overreport violence exposure and mental health service contact.

Conclusions

Our findings suggest several important directions for future research. First, from a methodological perspective, future studies would benefit from more comprehensive measures of mental health service contact and violence involvement that assess the nature and quality of service use, as well as the duration and severity of violence exposure. Further, understanding the type and effectiveness of mental health services provided to violence-exposed youth, and how these may differ from services provided to nonviolence-exposed youth, could provide essential information to inform best practices in service delivery. Second, we did not observe any racial/ethnic differences in mental health service contact, among this sample of students in schools primarily serving minority youth. Prior studies have documented racial/ethnic differences in mental health service use, but have not examined the association of disparities in service access with differential exposure to violence.^{16,28} Understanding the role of violence

exposure in determining whether minority youth access services can potentially inform research and practice to reduce racial/ethnic disparities in mental health service receipt.

Although our data do not speak directly to the mechanisms by which youth involved in violence do—or more often, do not—have a mental health service contact, we consider several possibilities. First, adults are often unaware of youth exposure to violence, which has implications for initiation of mental health services.^{12,32-34} Second, in a high violence-exposure context, such as the schools participating in the BYS, violence involvement may be considered normative, decreasing the likelihood that students, parents, and school staff would initiate mental health services connections for students. Third, youth may fear consequences, particularly for peer violence, where they may consider themselves vulnerable to disciplinary action.

Although schools are designed to allocate resources to students with the most severe mental health problems, from a public health and prevention perspective, identifying youth at risk for developing disorders and proactively providing services is an important priority. Repeated studies have demonstrated that students exposed to violence are at substantially increased risk for poor academic and psychological outcomes. In this context, we would hope that violence involvement would be associated with increased mental health service access, even independent of the mental health consequences of violence. As such, this study contributes to a small body of literature finding that students exposed to violence do not typically access mental health services.^{5,35} Efforts to identify violence-exposed youth may provide important alternate pathways to care that emphasize early intervention and provide support to students for whom existing mental disorders are compounded by violence exposure.

IMPLICATIONS FOR SCHOOL HEALTH

The majority of US children who receive mental health services receive them in school or on the basis of a school referral. As a result, schools are critical to determining whether, and how quickly, youth access mental health services.^{28,36,37} Schools can contribute to facilitating mental health service use for violence-exposed youth through improved outreach to students and trainings for school staff. First, mental health staff can be trained in interventions, such as cognitive behavioral intervention for trauma in schools, which are specifically aimed at relieving symptoms for trauma-exposed youth and provide a framework for trauma-informed interventions.³⁸ Second, training for teachers and school staff can emphasize understanding the negative psychological impact of exposure to violence and emphasize the

potential benefits of mental health services. Finally, schools can engage in school-wide screenings to systematically track violence exposures and related mental health outcomes, providing data that can inform school-level preventative interventions and outreach efforts for students.^{39,40}

Human Subjects Approval Statement

The research protocol, including informed consent procedures, received approval from the Harvard School of Public Health, Office of Human Research Administration. Secondary data analysis was exempted from full review by the Boston University Charles River Campus Institutional Review Board.

REFERENCES

1. Kaminski JW, Fang X. Victimization by peers and adolescent suicide in three US samples. *J Pediatr*. 2009;155(5):683-688.
2. Pastore DR, Fisher M, Friedman SB. Violence and mental health problems among urban high school students. *J Adolesc Health*. 1996;18(5):320-324.
3. Schwab-Stone ME, Ayers TS, Kaspro W, et al. No safe haven: a study of violence exposure in an urban community. *J Am Acad Child Adolesc Psychiatry*. 1995;34(10):1343-1352.
4. Green JG, Avenevoli S, Finkelman M, et al. Attention deficit hyperactivity disorder: concordance of the adolescent version of the composite international diagnostic interview version 3.0 (GDI) with the K-SADS in the US National Comorbidity Survey Replication Adolescent (NCS-A) supplement. *Int J Methods Psychiatr Res*. 2010;19(1):34-49.
5. Guterman NB, Hahm HC, Cameron M. Adolescent victimization and subsequent use of mental health counseling services. *J Adolesc Health*. 2002;30(5):336-345.
6. Turner H, Finkelhor D, Ormrod R. Predictors of receiving counseling in a national sample of youth: the relative influence of symptoms, victimization exposure, parent-child conflict, and delinquency. *J Youth Adolesc*. 2007;36:861-876.
7. Berkowitz SJ. Children exposed to community violence: the rationale for early intervention. *Clin Child Fam Psychol Rev*. 2003;6(4):293-302.
8. Stein BD, Jaycox LH, Kataoka SH, et al. A mental health intervention for schoolchildren exposed to violence. *JAMA*. 2003;290(5):603-611.
9. Dunn EC, Gilman SE, Willett JB, Slopen NB, Molnar BE. The impact of exposure to interpersonal violence on gender differences in adolescent-onset major depression: results from the National Comorbidity Survey Replication (NCS-R). *Depress Anxiety*. 2012;29(5):392-399.
10. Green JG, McLaughlin KA, Berglund PA, et al. Childhood adversities and adult psychiatric disorders in the National Comorbidity Survey Replication I: associations with first onset of DSM-IV disorders. *Arch Gen Psychiatry*. 2010;67(2):113-123. DOI: 10.1001/archgenpsychiatry.2009.186.
11. McLaughlin KA, Green JG, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and adult psychiatric disorders in the National Comorbidity Survey Replication II: associations with persistence of DSM-IV disorders. *Arch Gen Psychiatry*. 2010;67(2):124-132.
12. Guterman NB, Cameron M. Young clients' exposure to community violence: how much do their therapists know? *Am J Orthopsychiatry*. 1999;69(3):382-391.
13. Garland AF, Hurlburt MS, Hawley KM. Examining psychotherapy processes in a services research context. *Clin Psychol Sci Pract*. 2006;13(1):30-46.

14. Buka SL, Stichick TL, Birdthistle I, Earls FJ. Youth exposure to violence: prevalence, risks, and consequences. *Am J Orthopsychiatry*. 2001;71:298-310.
15. Finkelhor D, Turner H, Ormrod R, Hamby SL. Violence, abuse, and crime exposure in a national sample of children and youth. *Pediatrics*. 2009;124(5):1411-1423.
16. Kataoka SH, Zhang L, Wells KB. Unmet need for mental health care among US children: variation by ethnicity and insurance status. *Am J Psychiatry*. 2002;159(9):1548-1555.
17. Merikangas KR, He JP, Brody D, Fisher PW, Bourdon K, Koretz DS. Prevalence and treatment of mental disorders among US children in the 2001-2004 NHANES. *Pediatrics*. 2010;125:75-81.
18. Cabiya JJ, Canino G, Chavez L, et al. Gender disparities in mental health service use of Puerto Rican children and adolescents. *J Child Psychol Psychiatry*. 2006;47(8):840-848.
19. Hanson RF, Borntrager C, Self-Brown S, et al. Relations among gender, violence exposure, and mental health: the National Survey of Adolescents. *Am J Orthopsychiatry*. 2008;78(3):313-321.
20. Azrael D, Johnson RM, Molnar BE, et al. Creating a youth violence data system for Boston, Massachusetts. *Aust N Z J Criminol*. 2009;42:406-421.
21. BPS Communications Office. Boston public schools at a glance 2011-2012. Available at: http://www.bostonpublicschools.org/files/bps_at_a_glance_12-0419_0.pdf. Accessed February 12, 2013.
22. Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The revised Conflict Tactics Scale (CTS2): development and preliminary psychometric data. *J Fam Issues*. 1996;17(3):283-316.
23. Cooley-Strickland M, Quille TJ, Griffin RS, Stuart EA, Bradshaw CP, Furr-Holden D. Community violence and youth: affect, behavior, substance use, and academics. *Clin Child Fam Psychol Rev*. 2009;12:127-156.
24. Rothman EF, Johnson RM, Azrael D, Hall DM, Weinberg J. Perpetration of physical assault against dating partners, peers, and siblings among a locally representative sample of high school students in Boston, Massachusetts. *Arch Pediatr Adolesc Med*. 2010;164(12):1118-1124.
25. Dong M, Anda RF, Felitti VJ, et al. The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse Negl*. 2004;28(7):771-784.
26. Finkelhor D, Ormrod RK, Turner HA. Poly-victimization: a neglected component in child victimization. *Child Abuse Negl*. 2007;31(1):7-26.
27. Burns BJ, Costello EJ, Angold A, et al. Children's mental health service use across service sectors. *Health Aff (Millwood)*. 1995;14(3):147-159.
28. Merikangas KR, He JP, Burstein M, et al. Service utilization for lifetime mental disorders in US adolescents: results of the National Comorbidity Survey Adolescent supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry*. 2011;50(1):32-45.
29. Kessler RC, Davis CG, Kendler KS. Childhood adversity and adult psychiatric disorder in the US National Comorbidity Survey. *Psychol Med*. 1997;27(5):1101-1119.
30. Horwitz SM, Hulburt MS, Zhang J. Patterns and predictors of mental health services use by children in contact with the child welfare system. In: Webb MB, Dowd K, Harden BJ, Landsverk J, Testa MF, eds. *Child Welfare and Child Well-Being - New Perspectives from the National Survey of Child and Adolescent Well-being*. New York, NY: Oxford University Press; 2010:279-329.
31. Rosenblatt J, Robertson L, Bates M, Wood M, Furlong MJ, Sosna T. Troubled or troubling? Characteristics of youth referred to a system of care without system-level referral constraints. *J Emot Behav Disord*. 1998;6(1):42-54.
32. Fowler PJ, Tompsett CJ, Braciszewski JM, Jacques-Tiura A, Baltes BB. Community violence: a meta-analysis on the effect of exposure and mental health outcomes of children and adolescents. *Dev Psychopathol*. 2009;21(1):227-259.
33. Finkelhor D, Ormrod R, Turner H, Hamby S. School, police, and medical authority involvement with children who have experienced victimization. *Arch Pediatr Adolesc Med*. 2011;165(1):9-15.
34. Finkelhor D, Ormrod RK. Factors in the underreporting of crimes against juveniles. *Child Maltreat*. 2001;6(3):219-229.
35. Gladstein J, Rusonis EJ, Heald FP. A comparison of inner-city and upper-middle class youths' exposure to violence. *J Adolesc Health*. 1992;13(4):275-280.
36. Amaral G, Geierstanger S, Soleimanpour S, Brindis C. Mental health characteristics and health seeking behaviors of adolescent school-based health center users and nonusers. *J Sch Health*. 2011;81(3):138-145.
37. Farmer EM, Stangl DK, Burns BJ, Costello EJ, Angold A. Use, persistence, and intensity: patterns of care for children's mental health across one year. *Community Ment Health J*. 1999;35(1):31-46.
38. Ngo V, Langley A, Kataoka SH, Nadeem E, Escudero P, Stein BD. Providing evidence-based practice to ethnically diverse youths: examples from the Cognitive Behavioral Intervention for Trauma in Schools (CBITS) program. *J Am Acad Child Adolesc Psychiatry*. 2008;47(8):858-862.
39. Dowdy E, Ritchey K, Kamphaus RW. School-based screening: a population-based approach to inform and monitor children's mental health needs. *School Ment Health*. 2010;2(4):166-176.
40. Dunn EC, Johnson RM, Green JG. The Modified Depression Scale (MDS): a brief, no-cost assessment tool to estimate the level of depressive symptoms in students and schools. *School Ment Health*. 2012;4(1):34-45.