Elevated Risk of Posttraumatic Stress in Sexual Minority Youths: Mediation by Childhood Abuse and Gender Nonconformity

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Objectives. We examined whether lifetime risk of posttraumatic stress disorder (PTSD) was elevated in sexual minority versus heterosexual youths, whether childhood abuse accounted for disparities in PTSD, and whether childhood gender nonconformity explained sexual-orientation disparities in abuse and subsequent PTSD.

Methods. We used data from a population-based study (n = 9369, mean age = 22.7 years) to estimate risk ratios for PTSD. We calculated the percentage of PTSD disparities by sexual orientation accounted for by childhood abuse and gender nonconformity, and the percentage of abuse disparities by sexual orientation accounted for by gender nonconformity.

Results. Sexual minorities had between 1.6 and 3.9 times greater risk of probable PTSD than heterosexuals. Child abuse victimization disparities accounted for one third to one half of PTSD disparities by sexual orientation. Higher prevalence of gender nonconformity before age 11 years partly accounted for higher prevalence of abuse exposure before age 11 years and PTSD by early adulthood in sexual minorities (range = 5.2%–33.2%).

Conclusions. Clinicians, teachers, and others who work with youths should consider abuse prevention and treatment measures for gender-nonconforming children and sexual minority youths. (*Am J Public Health.* 2012;102:1587–1593. doi:10.2105/AJPH.2011.300530)

Posttraumatic stress disorder (PTSD) has severe sequelae that can particularly affect youths by disrupting the achievement of adulthood milestones. PTSD negatively affects career prospects through elevated risk of substance abuse[1] and unemployment,[2] reduces educational attainment by increasing the risk of school dropout,[2] and affects family formation by increasing the risk of relationship instability and adolescent pregnancy.[2] Studies have also indicated that the course of PTSD is chronic in one third of cases[2]; identifying risk factors in children and early adulthood is therefore particularly important for public health because PTSD in adolescence or early adulthood may affect health and well-being throughout adulthood. Research indicates that lesbian, gay, and bisexual youths have higher prevalence of mental health problems than heterosexuals, including anxiety, depression, and suicidality[3–6]; to our knowledge, however, no studies of youths have examined the association between sexual orientation and probable PTSD in samples including both sexual minorities and heterosexuals.

Childhood abuse greatly increases risk of developing PTSD.[7–9] Child abuse can directly trigger PTSD,[10] increase the risk of exposure to subsequent stressful events,[8] and increase the conditional risk of developing PTSD following exposure to subsequent stressful events.[11,12] Sexual minorities—lesbians, gay men, bisexuals, and "mostly heterosexuals"—experience higher rates of childhood abuse than do heterosexuals.[13–18] Thus, disparities in childhood abuse may be a cause of higher prevalence of PTSD among sexual minority youths compared with heterosexuals.

Additionally, gender-nonconforming appearance and behavior in childhood is more common among persons who will later have a minority sexual orientation.[19–21] Differences in gender nonconformity may contribute to sexual-orientation disparities in maltreatment in early and middle childhood, before sexual identity has developed, as childhood gender nonconformity has been associated with parental rejection, harassment, and physical and verbal victimization related to sexual orientation.[22–26]

We examine whether there are disparities in lifetime probable PTSD in youths by sexual orientation and whether greater exposure to child abuse may account for differences in PTSD. Additionally, we examine whether gender nonconformity accounts for higher prevalence of abuse before age 11 years and possible increased risk of PTSD among sexual minorities compared with heterosexuals. Because gender nonconformity has been associated with psychosocial stressors other than childhood abuse—namely, harassment and bullying—nonconformity may increase the risk of PTSD above and beyond its possible effects on childhood abuse. Given the high population prevalence of PTSD, its chronicity, and its associated impairment,[2] identifying factors that put children and youths at risk for PTSD is vital.

Although several studies have separately noted elevated prevalence of both child maltreatment and adulthood PTSD in sexual minorities,[17,22] to date, only 1 study in adults has shown that higher rates of childhood abuse may partially account for higher prevalence of PTSD in sexual minorities.[15] Very few studies have examined whether childhood gender nonconformity might explain elevated exposure to child abuse before adolescence[24,27] or probable PTSD among sexual minorities. We examine possible sexual-orientation disparities in childhood abuse and PTSD separately by gender because studies have found gender differences in PTSD and childhood abuse.[28,29] We further examine possible gender-by-sexual-orientation interactions in risk of PTSD and abuse.

METHODS

We used data from the Growing Up Today Study, a US population-based longitudinal cohort of 16 882 children of women participating in the Nurses' Health Study II, established in 1996 and followed up annually or biennially.[30] In this article, we used data primarily from the 2007 wave, when respondents were 19 to 27 years old (mean age = 22.7 years), which assessed PTSD symptoms, childhood maltreatment, and sexual orientation (n = 9784; 6144 women, 3640 men).

Measures

We measured "lifetime probable PTSD" with the 7-item Short Screening Scale for DSM-IV (*Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition) Posttraumatic Stress Disorder. Using a 6-symptom cutoff, the Short Screening Scale identified PTSD cases with a sensitivity of 38.0%, specificity of 99.5%, positive predictive value of 87.1%, and negative predictive value of 95% in a representative sample of Detroit residents aged 18 to 45 years.[31] We conservatively used this 6-symptom cutoff to increase positive predictive value because the prevalence of probable PTSD was high in the Growing Up Today Study using the measure's suggested 4-symptom cutoff (25% compared with 10% in the Detroit sample).

We assessed sexual orientation with 2 questions. The first asked,

> Which of the following best describes your feelings? (1) Completely heterosexual (attracted to persons of the opposite sex), (2) mostly heterosexual, (3) bisexual (equally attracted to men and women), (4) mostly homosexual, (5) completely homosexual (gay/lesbian, attracted to persons of the same sex), or (6) unsure.[32]

A second question asked whether during their lifetime, respondents had had sexual contact with men, women, both, or no sexual contact.[33] Respondents were characterized according to their sexual-orientation identity, except that respondents who reported "completely heterosexual" feelings but any lifetime same-sex sexual contact were categorized as "heterosexual with same-sex contact," because previous studies have indicated that population may have elevated prevalence of childhood abuse and PTSD.[15] Participants responding "mostly homosexual" or "completely homosexual" together formed a "lesbian–gay" category because each category individually was small; we excluded respondents "unsure" of their feelings (n = 3 [0.03%]). We used responses from the 2005 wave for respondents who participated in the 2007 wave but who were missing sexual-orientation responses in 2007 (n = 382 [3.9%]). We additionally excluded 77 people (0.8%) who did not respond to sexual-orientation questions in either wave.

Childhood abuse. All child abuse questions asked separately about abuse that occurred during childhood before age 11 years and abuse that occurred while a teenager, defined as ages 11 to 17 years. We created separate variables for these 2 time periods. We measured physical abuse in each time period with 4 questions from the Conflict Tactics Scales regarding frequency with which an adult in the family did the following: pushed, grabbed, or shoved the respondent; spanked for discipline; kicked, punched, physically attacked, or hit with something that could hurt; or hit the respondent so hard it left bruises or marks.[34] Abuse was coded dichotomously: respondents who were kicked, punched, attacked, hit with something, or bruised or marked were considered physically abused.

We measured sexual abuse with 2 questions: whether the respondent was touched by or forced to touch an adult or older child in a sexual way when he or she did not want to, and whether an adult or older child forced or attempted to force sexual activity by threatening, holding down, or hurting the respondent.[31] We coded sexual abuse as present or absent. We measured psychological abuse with 4 questions about the frequency with which adults in the family yelled at the respondent, said hurtful or insulting things, punished in a way that seemed cruel, and threatened serious physical harm.[35] We coded each psychological abuse item from 0 (never) to 4 (very often), and formed a score from the sum. Following recommendations to dichotomize this measure, we considered respondents in the top decile of this score to be psychologically abused and those below the top decile not to be abused, to identify children experiencing an unusual amount of psychological aggression.[36,37] However, results were similar in sensitivity analyses dichotomized instead at the top quintile.

Childhood gender nonconformity and covariates. We measured gender nonconformity in childhood with 4 questions from the Recalled Childhood Gender Identity/Gender Role Questionnaire[38] about behaviors during childhood up to age 11 years regarding favorite games and toys, roles taken in pretend play, movie or television characters imitated or admired, and feelings of femininity or masculinity. Response options ranged on a 5-point scale from "always women or girls/very 'feminine' " to "always boys or men/'very masculine.' " For each question, there was also the option, "I did not do this type of play" or "I did not feel 'feminine' or 'masculine' " as appropriate. These responses did not contribute to the nonconformity score, which was created by taking the mean of responses (Cronbach $\alpha = 0.78$). We then divided the score into 3 groups, separately by gender: below median, above median but below top decile, and top decile nonconforming, because preliminary analyses indicated a nonlinear relationship between nonconformity and our outcomes. We used recalled childhood gender nonconformity from the 2005 wave because it was more proximate to childhood than the 2007 wave. We used responses to identical questions from the 2007 wave for participants missing 2005 nonconformity data (n = 1443 [14.6% of respondents]). Agreement between the 2005 and 2007 assessments of childhood gender nonconformity was moderate (continuous measure, correlation = 0.74; ordinal measure, weighted $\kappa = 0.52$; agreement = 65.5%). We excluded 303 people (3.1%) missing gender nonconformity responses in both waves from analyses involving nonconformity.

Age at questionnaire return was continuous; race/ethnicity was non-Hispanic White or other race/ethnicity.

Analyses

To determine whether PTSD and childhood abuse were more prevalent among sexual minorities, we examined prevalence of PTSD and each type of childhood abuse by sexual orientation. Because studies have found gender differences in PTSD and childhood abuse,[28,29] we present prevalences separately by gender. We next constructed models examining 4 outcomes: lifetime PTSD and sexual, physical, and psychological abuse occurring at any time during childhood, with sexual orientation as the independent variable.

To determine whether childhood abuse partly accounted for sexual-orientation differences in PTSD, we created a model with PTSD as the dependent variable with childhood abuse and sexual orientation as the independent variables. We calculated the mediation proportion using the publicly available Mediate macro.[39,40] The mediation proportion is the proportion of excess PTSD experienced by sexual minorities relative to heterosexuals attributable to elevated exposure to abuse.

To test the hypothesis that gender nonconformity is a cause of sexual-orientation differences in exposure to abuse occurring before adolescence, we modeled each type of abuse occurring before age 11 years as the dependent variable and adulthood sexual orientation as the independent variable in models with and without gender nonconformity as an additional independent variable. We then calculated the mediation proportion—that is, the proportion of excess abuse experienced by sexual minorities before age 11 years, relative to that experienced by heterosexuals before age 11 years, that was attributable to elevated prevalence of gender nonconformity in sexual minorities. Finally, we examined whether higher prevalence of gender nonconformity in sexual minorities partially explained PTSD disparities among youths, above and beyond childhood abuse, by adding gender nonconformity as an independent variable to the model of PTSD and calculating the mediation proportion.

Because some women enrolled more than 1 child in the Growing Up Today Study, we used generalized estimating equations to account for clustering of data in families, using SAS 9.2 (SAS Institute, Cary, NC).[41] To test for prevalence differences in abuse and PTSD, we used a binomial distribution with a log link. These models did not adjust for covariates. To estimate risk ratios with our dichotomous dependent variables, we specified a Poisson distribution with a log link.[42] We adjusted models for risk ratios for race and age at questionnaire completion and stratified them by gender or adjusted them for gender.

RESULTS

Compared with heterosexuals without lifetime same-sex sexual contact (the sexual-orientation reference group), mostly heterosexual men

TABLE 1—Prevalence of Posttraumatic Stress Disorder (PTSD) and Childhood Abuse, by Sexual Orientation in Early Adulthood: United States, Growing Up Today Study, 2007 Wave

Variable	Heterosexual (n = 7828), %	Heterosexual With Any Lifetime Same-Sex Sexual Contact (n = 171), %	Mostly Heterosexual (n = 1417), %	Bisexual (n = 172), %	Lesbian/Gay (n = 196), %
Probable PTSD (lifetime)					
Women	6.6	10.9	13.5***	26.6***	18.6***
Men	4.0	9.3	11.8***	10.3	13.6
Psychological abuse before age 11 y					
Women	10.6	13.5	18.6***	30.5***	17.9*
Men	10.0	12.2	16.9**	19.2	17.1
Psychological abuse ages 11–17 y					
Women	10.9	15.8	21.8***	28.2***	12.9
Men	9.7	17.5	19.7***	16.0	13.2
Physical abuse before age 11 y					
Women	11.1	16.8*	19.1***	29.8***	15.5*
Men	13.1	22.0	20.4***	19.2	18.1
Physical abuse ages 11–17 y					
Women	8.1	9.2	15.1***	25.9***	7.1
Men	10.1	17.5	17.2***	12.0	12.3
Sexual abuse before age 11 y					
Women	7.0	14.5**	13.2***	21.2***	18.6***
Men	3.1	26.8***	6.7**	15.4**	7.6
Sexual abuse ages 11–17 y					
Women	6.1	17.6***	15.5***	23.0***	20.2***
Men	0.9	14.3***	4.1***	4.0	15.1***
Any physical abuse					
Women	13.0	19.0*	23.0***	37.2***	16.5
Men	16.2	29.3*	24.4***	23.1	19.8
Any psychological abuse					
Women	14.4	20.7*	25.9***	35.8***	20.0
Men	13.0	22.0	22.3***	19.2	19.8
Any sexual abuse					
Women	11.4	25.6***	24.3***	32.9***	31.4***
Men	3.5	34.9***	9.5***	19.2**	20.6***
Any abuse					
Women	26.6	43.2***	44.3***	59.3***	46.5***
Men	22.9	51.2***	33.9***	38.5	37.4*
Childhood gender nonconformity, top decile					
Women	13.1	19.2	24.1***	28.8***	59.5***
Men	7.5	14.3	25.7***	64.3***	75.0***

Note. Individual rows may have smaller n values because of missing responses. The full sample size was n = 9784.
*$P < .05$; **$P < .01$; ***$P < .001$ (2-sided Wald χ^2).

TABLE 2—Sexual Orientation in Early Adulthood and Exposure to Childhood Abuse: United States, Growing Up Today Study, 2007 Wave

Variable	Any Physical Abuse, RR (95% CI)	Any Psychological Abuse, RR (95% CI)	Any Sexual Abuse, Men, RR (95% CI)[a]	Any Sexual Abuse, Women, RR (95% CI)[a]
Sexual orientation				
Heterosexual (Ref)	1.0	1.0	1.0	1.0
Heterosexual, same-sex sexual contact	1.5** (1.2, 2.1)	1.5* (1.1, 2.0)	8.6*** (5.5, 13.5)	2.2*** (1.6, 3.0)
Mostly heterosexual	1.7*** (1.5, 1.9)	1.7*** (1.6, 1.9)	2.4*** (1.6, 3.5)	2.1*** (1.8, 2.4)
Bisexual	2.5*** (2.0, 3.1)	2.2*** (1.8, 2.8)	4.3** (1.7, 11.1)	2.8*** (2.2, 3.6)
Lesbian/gay	1.3 (0.8, 2.1)	1.6* (1.0, 2.4)	4.4*** (2.0, 9.8)	3.0*** (2.0, 4.5)

Note. CI = confidence interval; RR = risk ratio. Individual columns may have smaller n values because of missing responses. The full sample size was n = 9545.
[a]Models for sexual abuse are presented separately by gender because the gender-by-sexual-orientation interaction term was statistically significant for sexual abuse. For physical abuse and psychological abuse, the gender-by-sexual-orientation was not statistically significant, and risk ratio estimates therefore apply to both sexes.
*$P < .05$; **$P < .01$; ***$P < .001$ (2-sided Wald χ^2).

and women, and bisexual and lesbian women, had elevated lifetime probable PTSD (Table 1). Across sexual-orientation groups, women had higher prevalence of PTSD than did men. Among women, bisexual women had the highest prevalence of PTSD (26.6% vs 6.6% of the heterosexual reference group), and among men, gay men had the highest prevalence of PTSD (13.6% vs 4.0% of the reference group). Childhood sexual abuse was more prevalent in all sexual minorities compared with the reference group. Physical abuse was more prevalent among heterosexuals with same-sex sexual contact of both sexes and among mostly heterosexual and bisexual women. Psychological abuse was elevated in mostly heterosexuals of both sexes and in heterosexual women with same-sex sexual contact and bisexual women. Sexual minorities, except for heterosexuals with same-sex partners, were more likely to report childhood gender nonconformity than was the reference group (Table 1).

In models adjusted for age, race/ethnicity, and gender, risk of each type of abuse was elevated in all sexual minority groups, except that risk of physical abuse was not statistically significantly elevated in lesbians and gay men (Table 2). In models for risk of any sexual abuse, gender-by-sexual-orientation interaction terms indicated greater increased risk for sexual minority men versus sexual minority women compared, respectively, with the male and female reference group risk ($P < .001$). Sexual minority men were not at higher absolute risk for sexual abuse than were women, however. With the exception of heterosexuals with any lifetime same-sex sexual contact, women had higher exposure to sexual abuse than did men in each category of sexual orientation (Table 1). Gender-by-sexual-orientation interaction terms were not statistically significant for the 2 other types of abuse. In supplementary models using the 4-symptom PTSD cutoff, risk ratios for minorities remained

TABLE 3—Exposure to Childhood Abuse and Childhood Gender Nonconformity as Mediators of Sexual-Orientation Disparities in Posttraumatic Stress Disorder in Early Adulthood: United States, Growing Up Today Study, 2007 Wave

Variable	Model 1: Sexual Orientation, RR (95% CI)	Model 2: Sexual Orientation and Childhood Abuse, RR (95% CI)	Mediation Proportion, Childhood Abuse, %	Model 3: Sexual Orientation, Childhood Abuse, and Gender Nonconformity, RR (95% CI)	Mediation Proportion, Gender Nonconformity, Adjusted for Abuse, %
Sexual orientation					
Heterosexual (Ref)	1.0	1.0		1.0	
Heterosexual, same-sex sexual contact	1.7* (1.1, 2.7)	1.3 (0.8, 2.1)	48.4*	1.2 (0.8, 2.0)	29.7
Mostly heterosexual	2.1*** (1.8, 2.5)	1.6*** (1.3, 1.9)	38.3***	1.6*** (1.3, 1.9)	6.8*
Bisexual	3.7*** (2.8, 5.0)	2.4*** (1.8, 3.1)	35.7***	2.3*** (1.7, 3.1)	5.7
Lesbian/gay	2.8*** (1.7, 4.8)	2.1** (1.2, 3.5)	32.3*	1.7 (0.9, 2.9)	27.8
Childhood abuse					
Sexual		2.4*** (2.0, 2.8)		2.5*** (2.1, 2.9)	
Physical		1.4*** (1.2, 1.7)		1.4*** (1.2, 1.7)	
Psychological		2.0*** (1.6, 2.4)		2.0*** (1.6, 2.4)	
Childhood gender nonconformity					
Below median (Ref)				1.0	
Above median, below top decile				1.2* (1.0, 1.4)	
Top decile				1.4** (1.1, 1.7)	

Note. CI = confidence interval; RR = risk ratio. All models were adjusted for age at questionnaire return, race, and gender, or stratified by gender. The full sample size was n = 8968.
*$P < .05$; **$P < .01$; ***$P < .001$ (2-sided Wald χ^2).

TABLE 4—Gender Nonconformity Before Age 11 Years as a Mediator of Sexual-Orientation Disparities in Exposure to Childhood Abuse Before Age 11 Years: United States, Growing Up Today Study, 2007 Wave

	Sexual Abuse Before Age 11 Years			Physical Abuse Before Age 11 Years			Psychological Abuse Before Age 11 Years		
Variable	Model 1: Sexual Orientation, RR (95% CI)	Model 2: Sexual Orientation and Gender Nonconformity, RR (95% CI)	Mediation Proportion, %	Model 3: Sexual Orientation, RR (95% CI)	Model 4: Sexual Orientation and Gender Nonconformity, RR (95% CI)	Mediation Proportion, %	Model 5: Sexual Orientation, RR (95% CI)	Model 6: Sexual Orientation and Gender Nonconformity, RR (95% CI)	Mediation Proportion, %
Sexual orientation									
Heterosexual (Ref)	1.0	1.0		1.0	1.0		1.0	1.0	
Heterosexual, same-sex sexual contact	2.9*** (2.0, 4.3)	2.9*** (2.0, 4.2)	5.9	1.6*** (1.1, 2.2)	1.6*** (1.1, 2.2)	8.7	1.3 (0.8, 1.9)	1.2 (0.8, 1.9)	7.6
Mostly heterosexual	2.0*** (1.6, 2.4)	1.9*** (1.6, 2.2)	15.0*	1.6*** (1.4, 1.9)	1.6*** (1.4, 1.8)	12.1*	1.7*** (1.5, 1.9)	1.7*** (1.4, 1.9)	7.0
Bisexual	3.2*** (2.3, 4.5)	3.0*** (2.1, 4.2)	13.3**	2.4*** (1.9, 3.2)	2.3*** (1.8, 3.0)	8.6*	2.7*** (2.1, 3.5)	2.6*** (2.0, 3.3)	5.2
Lesbian/gay	2.4** (1.3, 4.3)	2.0* (1.1, 3.8)	33.2*	1.5 (0.9, 2.5)	1.3 (0.8, 2.1)	NA[a]	1.7* (1.0, 2.9)	1.5 (0.9, 2.6)	25.6
Gender nonconformity									
Below median (Ref)		1.0			1.0			1.0	
Above median, below top decile		1.2 (1.0, 1.4)			1.0 (0.9, 1.2)			1.0 (0.8, 1.1)	
Top decile		1.4** (1.1, 1.7)			1.3*** (1.1, 1.5)			1.3** (1.1, 1.5)	

Note. CI = confidence interval; NA = not applicable; RR = risk ratio. All models were adjusted for gender. The full sample size was n = 8968.
[a]Because lesbians and gay men were not at statistically significant increased risk for physical abuse, there was no elevated risk to be mediated.
*$P < .05$; **$P < .01$; ***$P < .001$ (2-sided Wald χ^2).

elevated and statistically significant, though somewhat attenuated.

In a model adjusted for race/ethnicity, gender, and age, risk of PTSD was 1.7 to 3.7 times greater for sexual minorities than for the heterosexual reference group (Table 3, Model 1). Elevated exposure to childhood abuse explained between 32.3% and 48.4% of the elevated risk of PTSD among sexual minorities (Table 3, Model 2). A gender-by-sexual-orientation interaction term was not statistically significant in the model for PTSD.

Gender nonconformity partly explained disparities in childhood physical and sexual abuse exposure before age 11 years for some sexual minority groups (Table 4), suggesting that nonconformity may be one cause of higher prevalence of abuse in sexual minorities. For heterosexuals with same-sex partners, gender nonconformity did not mediate elevated risk of abuse, and for mostly heterosexuals and bisexuals the mediation proportion was small (from no mediation to 15%). By contrast, gender nonconformity accounted for one third of the elevated risk of sexual abuse in the lesbian–gay group. Gender nonconformity was not a significant mediator of increased risk of psychological abuse for any sexual minority group. In sensitivity analyses with nonconformity as a continuous variable, mediation estimates were similar or smaller. In models adjusted for childhood abuse, gender nonconformity further mediated sexual-orientation disparities in PTSD for mostly heterosexuals, although very slightly (Table 3, Model 3). In supplementary analyses stratified by gender, mediation proportions were similar for men and women.

DISCUSSION

Our results indicate that sexual minority young adults are at greatly increased risk for lifetime probable PTSD and that a substantial portion of this elevated risk stems from higher exposure to childhood abuse. These results correspond with previous findings of elevated prevalence of PTSD among sexual minority adults aged 20 to 90 years,[15] suggesting that risk of PTSD is elevated for sexual minorities across late adolescence and adulthood.

Gender nonconformity before age 11 years partly explained elevated prevalence of childhood abuse before age 11 years among sexual minority youths, suggesting that targeting of gender-nonconforming children may be one explanation for higher abuse prevalence before adolescence in sexual minorities. However, nonconformity accounted for no more than one third of the relationship between sexual orientation and abuse before age 11 years in our data; therefore, other factors are likely to also contribute to this association. For example, it is possible that persons who will later have a minority orientation have other behaviors that distinguish them from children who will later have a heterosexual orientation, and that these behaviors may result in their being targeted for abuse. Gender nonconformity also partly mediated higher prevalence of PTSD in mostly heterosexuals, over and above childhood abuse, suggesting that stressors other than abuse—such as peer rejection and bullying—experienced by gender-nonconforming sexual minority children[22–26] put them at elevated risk for PTSD by early adulthood.

PTSD is associated with serious sequelae, including psychiatric disorders such as depression,[43] health risk behaviors such as alcohol use disorder,[43] and physical sequelae,[44] including higher body mass index, higher

cholesterol,[45] heart disease,[46] asthma,[47] arthritis,[47,48] diabetes,[47,49,50] and death.[46] Empirically supported treatments for PTSD are increasingly available[51]; however, in national surveys, no more than half of people with PTSD report having sought treatment.[52] Outreach to sexual minorities aimed at reducing the stigma of mental illness, increasing awareness of treatment options, and reducing barriers to treatment of PTSD is needed for prevention of sequelae.

A recently released Institute of Medicine report on lesbian, gay, bisexual, and transgendered people called for better understanding of factors influencing sexual minority health across the life course.[53] Our study identifies 3 connected factors that influence sexual minority health: gender nonconformity before age 11 years; sexual, physical, and psychological abuse before age 18 years; and development of PTSD by early adulthood. Given the serious health sequelae of PTSD, the high prevalence of PTSD among sexual minorities in early adulthood potentially sets the stage for poorer health throughout adulthood.[54–56]

Limitations

Our results should be considered in light of 4 limitations. First, because our questionnaire did not exclude unwanted encounters when asking about sex of sexual contacts, and because sexual abuse perpetrators are overwhelmingly male,[57] men may have been referring to an abuser when they reported same-sex sexual contact. Thus, heterosexuals with same-sex sexual contact may have included men with no voluntary same-sex contact. Additionally, because our measure of sexual abuse included contact by caregivers, older children, and nonrelatives, we cannot identify perpetrators. Second, we relied on retrospective reporting of childhood gender nonconformity and childhood abuse; therefore, recall error could bias estimates. Longitudinal studies of children with court-documented histories of abuse have shown that a substantial minority do not report the occurrence of abuse when asked in adulthood.[58] However, a study comparing adulthood reporting of childhood nonconformity with independent ratings based on childhood home video recordings found good concordance, although more so for men than women.[21] Third, sexual minorities may be more willing to report abuse victimization histories than heterosexuals, which would inflate estimates of the association between orientation and abuse.[59] Fourth, our sample was predominantly White (93%), and the findings may not apply to other groups.

Conclusions

Our study has several implications for pediatricians, school health providers, and others who work with children, adolescents, and young adults. Care providers should be aware that gender-nonconforming children and adolescents who identify as sexual minorities, including individuals who consider themselves "mostly heterosexual" versus "completely heterosexual" or who have had same-sex sexual contact, may be experiencing ongoing abuse, which must be identified and stopped. Moreover, sexual minority adolescents and young adults, particularly women, are at high risk for PTSD symptoms or other sequelae of childhood abuse and may be in need of treatment sensitive to their minority sexual orientation. Given the severe health and adjustment sequelae of PTSD and the often chronic course, early intervention to prevent or treat PTSD may be essential to ultimately eliminating sexual-orientation disparities in health. ■

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This article was accepted October 6, 2011.

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All authors contributed to designing the analytic approach, interpreting the data, and editing and revising the article. A. L. Roberts conducted the data analysis and wrote the first draft of the article.

Acknowledgments

This work was funded by the National Institutes of Health (NIH; grants HD057368 and HD049889). A. L. Roberts, S. B. Austin, and M. Rosario are supported by NIH (grant R01 HD057368). S B Austin and H. L. Corliss are supported by the Leadership Education in Adolescent Health project, Maternal and Child Health Bureau (grant HRSA 6T71-MC00009-17). H. L. Corliss is supported by the National Institute on Drug Abuse (grant NIDA K01 DA023610). K. C. Koenen is supported by National Institute of Mental Health (grants MH070627 and MH078928).

We acknowledge the Channing Laboratory, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School for its management of the Growing Up Today Study.

Human Participant Protection

The institutional review board at Brigham and Women's Hospital approved this study.

References

1. Breslau N, Davis GC, Schultz LR. Posttraumatic stress disorder and the incidence of nicotine, alcohol, and other drug disorders in persons who have experienced trauma. *Arch Gen Psychiatry.* 2003;60(3):289–294.

2. Kessler RC. Posttraumatic stress disorder: the burden to the individual and to society. *J Clin Psychiatry.* 2000;61(suppl 5):4–12.

3. Kann L, Olsen EO, McManus T, et al. Sexual identity, sex of sexual contacts, and health-risk behaviors among students in grades 9–12—youth risk behavior surveillance, selected sites, United States, 2001–2009. *MMWR Surveill Summ.* 2011;60(7):1–133.

4. King M, Semlyen J, Tai SS, et al. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry.* 2008;8:70.

5. Lewis NM. Mental health in sexual minorities: recent indicators, trends, and their relationships to place in North America and Europe. *Health Place.* 2009;15(4):1029–1045.

6. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull.* 2003;129(5):674–697.

7. Elklit A. Victimization and PTSD in a Danish national youth probability sample. *J Am Acad Child Adolesc Psychiatry.* 2002;41(2):174–181.

8. Kearney C, Wechsler A, Kaur H, Lemos-Miller A. Posttraumatic stress disorder in maltreated youth: a review of contemporary research and thought. *Clin Child Fam Psychol Rev.* 2010;13(1):46–76.

9. Widom CS. Posttraumatic stress disorder in abused and neglected children grown up. *Am J Psychiatry.* 1999;156(8):1223–1229.

10. Copeland WE, Keeler G, Angold A, Costello EJ. Traumatic events and posttraumatic stress in childhood. *Arch Gen Psychiatry.* 2007;64(5):577–584.

11. Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *J Consult Clin Psychol.* 2000;68(5):748–766.

12. Breslau N, Chilcoat HD, Kessler RC, Davis GC. Previous exposure to trauma and PTSD effects of

subsequent trauma: results from the Detroit Area Survey of Trauma. *Am J Psychiatry.* 1999;156(9):902–907.

13. Austin SB, Jun HJ, Jackson B, et al. Disparities in child abuse victimization in lesbian, bisexual, and heterosexual women in the Nurses' Health Study II. *J Womens Health (Larchmt).* 2008;17(4):597–606.

14. Herek GM. Hate crimes and stigma-related experiences among sexual minority adults in the United States: prevalence estimates from a national probability sample. *J Interpers Violence.* 2009;24(1):54–74.

15. Roberts AL, Austin SB, Corliss HL, Vandermorris AK, Koenen KC. Pervasive trauma exposure among US sexual orientation minority adults and risk of posttraumatic stress disorder. *Am J Public Health.* 2010; 100(12):2433–2441.

16. Jorm AF, Korten AE, Rodgers B, Jacomb PA, Christensen H. Sexual orientation and mental health: results from a community survey of young and middle-aged adults. *Br J Psychiatry.* 2002;180(5):423–427.

17. Corliss HL, Cochran SD, Mays VM. Reports of parental maltreatment during childhood in a United States population-based survey of homosexual, bisexual, and heterosexual adults. *Child Abuse Negl.* 2002;26(11): 1165–1178.

18. Wilson H, Widom C. Does physical abuse, sexual abuse, or neglect in childhood increase the likelihood of same-sex sexual relationships and cohabitation? A prospective 30-year follow-up. *Arch Sex Behav.* 2010; 39(1):63–74.

19. Bailey JM, Zucker KJ. Childhood sex-typed behavior and sexual orientation: a conceptual analysis and quantitative review. *Dev Psychol.* 1995;31(1):43–55.

20. Dunne MP, Bailey JM, Kirk KM, Martin NG. The subtlety of sex-atypicality. *Arch Sex Behav.* 2000;29(6): 549–565.

21. Rieger G, Linsenmeier JA, Gygax L, Bailey JM. Sexual orientation and childhood gender nonconformity: evidence from home videos. *Dev Psychol.* 2008;44(1):46–58.

22. D'Augelli AR, Grossman AH, Starks MT. Childhood gender atypicality, victimization, and PTSD among lesbian, gay, and bisexual youth. *J Interpers Violence.* 2006; 21(11):1462–1482.

23. Landolt MA, Bartholomew K, Saffrey C, Oram D, Perlman D. Gender nonconformity, childhood rejection, and adult attachment: a study of gay men. *Arch Sex Behav.* 2004;33(2):117–128.

24. Plöderl M, Fartacek R. Childhood gender nonconformity and harassment as predictors of suicidality among gay, lesbian, bisexual, and heterosexual Austrians. *Arch Sex Behav.* 2009;38(3):400–410.

25. Blashill A, Powlishta K. The impact of sexual orientation and gender role on evaluations of men. *Psychol Men Masc.* 2009;10(2):160–173.

26. Smith TE, Leaper C. Self-perceived gender typicality and the peer context during adolescence. *J Res Adolesc.* 2006;16(1):91–103.

27. Harry J. Parental physical abuse and sexual orientation in males. *Arch Sex Behav.* 1989;18(3):251–261.

28. Molnar BE, Buka SL, Kessler RC. Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. *Am J Public Health.* 2001; 91(5):753–760.

29. Tolin DF, Foa EB. Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychol Bull.* 2006;132(6): 959–992.

30. Field AE, Camargo CA Jr, Taylor CB, et al. Overweight, weight concerns, and bulimic behaviors among girls and boys. *J Am Acad Child Adolesc Psychiatry.* 1999;38(6):754–760.

31. Koss MP, Gidycz CA. Sexual experiences survey: reliability and validity. *J Consult Clin Psychol.* 1985; 53(3):422–423.

32. Remafedi G, Resnick M, Blum R, Harris L. Demography of sexual orientation in adolescents. *Pediatrics.* 1992;89(4 pt 2):714–721.

33. *2003 Youth Risk Behavior Survey Results.* Malden, MA: Massachusetts Dept of Education; 2004.

34. Straus MA, Hamby SL, Boney-McCoy SUE, Sugarman DB. The Revised Conflict Tactics Scales (CTS2). *J Fam Issues.* 1996;17(3):283–316.

35. Bernstein DP, Stein JA, Newcomb MD, et al. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse Negl.* 2003;27(2):169–190.

36. Straus MA. Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scales. In: Straus MA, Gelles RJ, eds. *Physical Violence in American Families.* New Brunswick, NJ: Transaction Publishers; 1990: 29–47.

37. Straus MA, Hamby SL, Finkelhor D, Moore DW, Runyan D. Identification of child maltreatment with the Parent-Child Conflict Tactics Scales: development and psychometric data for a national sample of American parents. *Child Abuse Negl.* 1998;22(4):249–270.

38. Zucker K, Mitchell J, Bradley S, Tkachuk J, Cantor J, Allin S. The Recalled Childhood Gender Identity/Gender Role Questionnaire: psychometric properties. *Sex Roles.* 2006;54(7–8):469–483.

39. Hertzmark E, Fauntleroy J, Skinner S, Jacobson D, Spiegelman D. *The SAS Mediate Macro.* Boston, MA: Brigham and Women's Hospital, Channing Laboratory; 2009.

40. Lin DY, Fleming TR, De Gruttola V. Estimating the proportion of treatment effect explained by a surrogate marker. *Stat Med.* 1997;16(13):1515–1527.

41. Liang K-Y, Zeger SL. Longitudinal data analysis using generalized linear models. *Biometrika.* 1986;73: 13–22.

42. Zou G. A modified Poisson regression approach to prospective studies with binary data. *Am J Epidemiol.* 2004;159(7):702–706.

43. Breslau N, Davis GC, Peterson EL, Schultz L. Psychiatric sequelae of posttraumatic stress disorder in women. *Arch Gen Psychiatry.* 1997;54(1):81–87.

44. Beckham JC, Moore SD, Feldman ME, Hertzberg MA, Kirby AC, Fairbank JA. Health status, somatization, and severity of posttraumatic stress disorder in Vietnam combat veterans with posttraumatic stress disorder. *Am J Psychiatry.* 1998;155(11):1565–1569.

45. Trief PM, Ouimette P, Wade M, Shanahan P, Weinstock RS. Post-traumatic stress disorder and diabetes: co-morbidity and outcomes in a male veterans sample. *J Behav Med.* 2006;29(5):411–418.

46. Boscarino JA. A prospective study of PTSD and early-age heart disease mortality among Vietnam veterans: implications for surveillance and prevention. *Psychosom Med.* 2008;70(6):668–676.

47. Lauterbach D, Vora R, Rakow M. The relationship between posttraumatic stress disorder and self-reported health problems. *Psychosom Med.* 2005; 67(6):939–947.

48. Norman SB, Means-Christensen AJ, Craske MG, Sherbourne CD, Roy-Byrne PP, Stein MB. Associations between psychological trauma and physical illness in primary care. *J Trauma Stress.* 2006;19(4):461–470.

49. Sledjeski EM, Speisman B, Dierker LC. Does number of lifetime traumas explain the relationship between PTSD and chronic medical conditions? Answers from the National Comorbidity Survey-Replication (NCS-R). *J Behav Med.* 2008;31(4):341–349.

50. Goodwin RD, Davidson JR. Self-reported diabetes and posttraumatic stress disorder among adults in the community. *Prev Med.* 2005;40(5):570–574.

51. Foa EB, Keane TM, Friedman MJ. *Effective Treatments for PTSD: Practice Guidelines From the International Society for Traumatic Stress Studies.* New York, NY: Guilford Press; 2008.

52. Roberts AL, Gilman SE, Breslau J, Breslau N, Koenen KC. Race/ethnic differences in exposure to traumatic events, development of post-traumatic stress disorder, and treatment-seeking for post-traumatic stress disorder in the United States. *Psychol Med.* 2011;41(1): 71–83.

53. Institute of Medicine. *The Health of Lesbian, Gay, Bisexual, and Transgender (LGBT) People: Building a Foundation for Better Understanding.* Washington, DC: National Academies Press; 2011.

54. Case P, Austin SB, Hunter DJ, et al. Sexual orientation, health risk factors, and physical functioning in the Nurses' Health Study II. *J Womens Health (Larchmt).* 2004;13(9):1033–1047.

55. Cochran SD, Mays VM. Relation between psychiatric syndromes and behaviorally defined sexual orientation in a sample of the US population. *Am J Epidemiol.* 2000;151(5):516–523.

56. Cochran SD, Mays VM. Physical health complaints among lesbians, gay men, and bisexual and homosexually experienced heterosexual individuals: results from the California Quality of Life Survey. *Am J Public Health.* 2007;97(11):2048–2055.

57. Holmes WC, Slap GB. Sexual abuse of boys: definition, prevalence, correlates, sequelae, and management. *JAMA.* 1998;280(21):1855–1862.

58. Williams LM. Recall of childhood trauma: a prospective study of women's memories of child sexual abuse. *J Consult Clin Psychol.* 1994;62(6):1167–1176.

59. Saewyc EM, Skay CL, Pettingell SL, et al. Hazards of stigma: the sexual and physical abuse of gay, lesbian, and bisexual adolescents in the United States and Canada. *Child Welfare.* 2006;85(2):195–213.