HHS Public Access

Author manuscript

Am J Prev Med. Author manuscript; available in PMC 2021 May 01.

Published in final edited form as:

Am J Prev Med. 2020 May ; 58(5): e159–e169. doi:10.1016/j.amepre.2019.12.021.

Violence Victimization, Substance Use Disparities, and Gender-Nonconforming Youth

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Abstract

Introduction: Exposure to violence victimization may help explain disparities of substance use among gender-nonconforming youth (i.e., those whose gender expression differs from societal expectations).

Methods: In 2015, three large urban school districts (2 in California and 1 in Florida) conducted a Youth Risk Behavior Survey that included the assessment of gender expression among a racially/ethnically diverse population-based sample of 6,082 high school students. Five categories of violence victimization were assessed (felt unsafe at school, threatened or injured with a weapon at school, bullied at school, electronically bullied, and forced sexual intercourse). In 2019, the effect of violence victimization on substance use disparities was examined by calculating sex-stratified prevalence ratios by gender nonconformity, adjusted for sexual identity, race/ethnicity, and grade (adjusted prevalence ratio 1 [APR1]), and comparing these with prevalence ratios adjusted for those variables plus violence victimization (adjusted prevalence ratio 2 [APR2]).

Results: Among female students, only being threatened or injured with a weapon was significantly ($p<0.05$) associated with gender nonconformity and there were no substance use disparities by gender nonconformity. Among male students, every category of violence victimization was more prevalent among gender-nonconforming than among gender-conforming students and most substance use categories demonstrated significant gender nonconformity disparities. After controlling for violence victimization, these disparities decreased but remained statistically significant for the use of cocaine (APR1=2.84 vs APR2=1.99), methamphetamine (APR1=4.47 vs APR2=2.86), heroin (APR1=4.55 vs APR2=2.96), and injection drug use (APR1=7.90 vs APR2=4.72).

Conclusions: School-based substance use prevention programs may benefit from strategies that support gender diversity and reduce violence victimizations experienced by gender-nonconforming students, by providing a safe and supportive school environment.

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No financial disclosures were reported by the authors of this paper.

SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at https://doi.org/10.1016/j.amepre.2019.12.021.

INTRODUCTION

Gender-nonconforming adolescents, that is, those whose appearance or behaviors do not align with the societal expectations of their gender,[1,2] may experience higher risk for substance use than gender-conforming youth.[3–5] Given the well-documented negative effects of adolescent substance use on developmental, social, and health outcomes,[6] disproportionate rates of substance use raise important questions about what factors may be driving this trend. One potential explanatory mechanism may be the role of minority stress in the lives of gender-nonconforming youth. Minority stress refers to the ways in which social stigma adversely affects the health of marginalized groups through both external stressors like discrimination and harassment, as well as internal stressors like internalized stigma and expectations of rejection.[7] A broad literature details how individuals with stigmatized social identities and characteristics experience minority stress, including external stressors such as prejudice, discrimination, harassment, and violence victimization by peers.[2,7–10] This type of harassment and victimization has well-documented adverse effects on health, including increased rates of substance use.[5,7,8,11–13] In addition, there is some evidence suggesting that youth who experience violence victimization across multiple domains (e.g., verbal, physical, and sexual) may be at a greater risk of psychological distress, depression, and substance use disorder than those who experience 1 type of victimization.[14,15]

Gender-nonconforming youth do appear to experience greater rates of harassment and bullying than their gender-conforming peers.[4,9,16,17] Cross-sectional, retrospective, and longitudinal studies all point to the fact that gender nonconformity in childhood and adolescence is associated with high rates of bullying and victimization relative to gender-conforming peers.[9,17–19] Notably, gender-nonconforming male youth appear to be at a greater risk for victimization than gender-nonconforming female youth.[18,20–22] This gender disparity is theorized to result from more rigid social norms around gender for men, as well as the elevated status of men in the society.[21,23] Because of this social positioning, when men and boys display gender nonconformity, this is perceived as a greater transgression than women who display gender nonconformity, and thus they are often met with pushback from peers in the form of harassment and victimization.[21]

Consistent with the broader literature on minority stress in other populations,[7,8] early evidence points to the association of harassment and bullying with adverse health implications for gender-nonconforming youth. For example, longitudinal research with adolescents demonstrates that gender nonconformity is associated with increased depressive symptoms throughout adolescence, and that these depressive symptoms are in part explained by the elevated rates of victimization endured by these same youth.[18] Thus, greater exposure to experiences of violence victimization among gender-noncon-forming adolescents may be related to an increased risk of negative health outcomes like depression and substance use disorder.[5,18] A possible explanation for the gender expression—related disparities in substance use is the use of illicit substances as a method of coping with minority stress.[3,5,7,8,12,13]

A connection between stigma-related victimization and substance use has been found in other populations of vulnerable and often-stigmatized youth. A national study of U.S. high school students recently examined the effect of minority stress on disparities in substance use by sexual orientation.[11] Both substance use and minority stressors were more prevalent among sexual minority students (e.g., those identifying as lesbian, gay, or bisexual) than their heterosexual peers. However, disparate rates of substance use among sexual minority students were reduced after controlling for minority stressors, suggesting some of the increased substance use may result from coping with experiences of minority stress.[11] Similar results have been found among transgender adolescents who report greater discrimination and harassment, as well as increased substance use than their cisgender peers.[5]

This study extends the literature by examining the associations among gender nonconformity, experiences of violence victimization, and substance use disparities parities among high school students. The objectives of this study include an examination, separately among male and female high school students, of the following parameters:

1. Prevalence of gender nonconformity,individual categories of violence victimization, and multiple victimization (i.e., a high-risk group experiencing 3 or more categories of violence victimization);
2. Associations between gender nonconformity and violence victimization;
3. Associations between the number of violence victimization categories experienced and substance use;
4. The magnitude of gender nonconformity-related substance use disparities among students; and
5. The effect of controlling for violence victimization experiences on the observed substance use disparities.

Exploring these objectives will help inform the interventions that seek to reduce or eliminate substance use disparities among gender-nonconforming youth.

METHODS

Study Sample

As part of the Youth Risk Behavior Surveillance System, conducted by the Centers for Disease Control and Prevention (CDC), approximately 20 large urban school districts conduct the Youth Risk Behavior Survey (YRBS) biennially using a 2-stage cluster sample design to produce a representative sample of public high school students in Grades 9–12 within each jurisdiction. In 2015, three of these large urban school districts included an optional question on their YRBS questionnaire for assessing gender expression among students, in addition to standard items that assessed sexual identity and other demographic characteristics. Data from these 3 school districts (2 in California and 1 in Florida) were combined into a single dataset (n=6,082 students: 3,139 males and 2,919 females), resulting in a racially/ethnically diverse population-based sample of U.S. high school students in large urban school districts. Questionnaires were administered in the classroom during a regular

class period. Responses were recorded directly on computer-scannable answer sheets. Student participation in the survey was anonymous and voluntary, and local procedures were used to obtain parental consent. Overall response rates ranged between 70% and 90%, and sample sizes ranged between 1,000 and 3,000 students. Each of these school districts reviewed and approved the YRBS using their local procedures. The national YRBS has been reviewed and approved by an IRB at CDC. The data used in this study were approved by CDC as research not involving identifiable human subjects.

Measures

Using a validated measure,[24,25] gender expression was assessed with the question: *A person's appearance, style, dress, or the way they walk or talk may affect how people describe them. How do you think people at school would describe you?* Response options were: *very feminine, mostly feminine, somewhat feminine, equally feminine and masculine, somewhat masculine, mostly masculine,* and *very masculine.* Based on a student's response to the gender expression question and the question: *What is your sex?* (Response options: *female, male*), a 7-point gender nonconformity scale was created that ranged from 1=very gender conforming (i.e., very masculine male students and very feminine female students) to 7=very gender nonconforming (i.e., very feminine male students and very masculine female students). To ensure adequate cell sizes to produce stable prevalence estimates, the gender nonconformity scale was further collapsed into a 3-level gender nonconformity variable: a reference group consisting of gender-conforming students (very/mostly/somewhat masculine male students, and very/ mostly/somewhat feminine female students), equally feminine and masculine students, and gender-nonconforming students (very/mostly/somewhat feminine male students, and very/mostly/ somewhat masculine female students). Sexual identity was assessed with the following question: *Which of the following best describes you?* Response options were *heterosexual (straight), gay or lesbian, bisexual,* and *not sure.* Sexual identity was coded as a 3-level variable: gay, lesbian, or bisexual; not sure; and heterosexual. Demographic characteristics assessed included race/ethnicity (coded: white, non-Hispanic; black, non-Hispanic; Hispanic; and other), and grade (coded: 9th, 10th, 11th, and 12th). The YRBS also assessed current cigarette, alcohol, and marijuana use, as well as lifetime prescription drug misuse, cocaine use, methamphetamine use, heroin use, and injection drug use. Finally, 5 categories of violence victimization were assessed (i.e., feeling unsafe at school or on the way to or from school, being threatened or injured with a weapon at school, being bullied at school, being bullied electronically, and experiencing forced sexual intercourse). Using these 5 categories of violence victimization, a 3-level count variable was created to express the number of categories of violence victimization experienced (3 or more, 1–2, 0). In addition, a "multiple victimization" variable was created to identify the highest risk group of youth who experienced 3 or more categories of violence victimization (3 or more versus fewer than 3) (Appendix Table 1, available online).

Statistical Analysis

In 2019, data were analyzed using SUDAAN, version 11.0.0. Prevalence estimates with 95% CIs were calculated by using Taylor series linearization. Differences in unadjusted prevalence estimates were tested using chi-squared statistics. Sex-stratified logistic regression models were used to describe the associations between gender nonconformity and

violence victimization, by using adjusted (for sexual identity, race/ethnicity, and grade) prevalence ratios (APRs) with 95% CIs. Next, sex-stratified logistic regression models were used to describe the substance use disparities, by gender nonconformity, using adjusted (for sexual identity, race/ethnicity, and grade) prevalence ratios (Model 1, APR1). Finally, sex-stratified logistic regression models were used to describe the substance use disparities, by gender nonconformity, after adjusting for sexual identity, race/ethnicity, grade, and the number of categories of violence victimization experienced (Model 2, APR2). The effect of the number of categories of violence victimization experienced on substance use disparities, by gender nonconformity, was examined by comparing APR1 (without controlling for violence victimization) and APR2 (controlling for violence victimization).

Statistical tests were considered significant if $p<0.05$ or the 95% CI did not include 1.0. Missing data were not imputed.

RESULTS

Among the total student population, 76.8% of male and 82.5% of female students were gender conforming; 10.2% of male and 13.5% of female students were equally feminine/masculine; and 13.0% of male and 4.0% of female students were gender nonconforming (Table 1). Both male and female students experienced violence victimization, with some variation in the types of violence victimizations experienced. The prevalence of violence victimization categories ranged from 6.5% to 12.8% among male students, and 4.0% to 17.7% among female students. Male students were more likely to be threatened or injured with a weapon at school than female students, and female students were more likely to be bullied at school or bullied electronically than male students. Multiple victimization (i.e., 3 or more categories of violence victimization) occurred among 3.1% of male students and 4.4% of female students.

Among male students, each category of violence victimization was 2–3 times (APRs ranged from 1.67 to 2.93) as likely among gender-nonconforming compared with gender-conforming students; multiple victimization was 4 times (APR=3.83) as likely (Table 2). However, among female students, only being threatened or injured with a weapon at school was associated with gender nonconformity (APR=1.97 for equally feminine/masculine female students); multiple victimization was not associated with gender nonconformity.

Among male and female students, in fully adjusted models (Table 3, Model 2), experiences of violence victimization were consistently associated with every category of substance use. Among male students, associations between multiple (i.e., 3 or more) victimizations and substance use ranged from APR=2.11 for prescription drug misuse to APR=12.2 for heroin use. Among female students, the associations between multiple victimization and substance use ranged from APR=2.36 for marijuana use to APR=18.3 for heroin use.

Finally, the magnitude of substance use disparities, by gender nonconformity, was examined (Table 3). Among male students, before controlling for violence victimization experiences (Model 1), nonconforming gender expression was associated with prescription drug misuse, cocaine use, methamphetamine use, heroin use, and injection drug use. Among female

students, before controlling for violence victimization timization experiences (Model 1), nonconforming gender expression was not associated with any category of substance use. The effect of violence victimization experiences on substance use among gender-nonconforming male students was examined by comparing the magnitude of substance use disparities, by gender nonconformity, before (Model 1, APR1) and after (Model 2, APR2) controlling for the number of violence victimization categories experienced (Table 3). Among male students, after controlling for the number of violence victimizations experienced, substance use disparities were consistently smaller but remained statistically significant (prescription drug misuse, APR1=1.81 vs APR2=1.60; cocaine use, APR1=2.84 vs APR2=1.99; methamphetamine use, APR1=4.47 vs APR2=2.86; heroin use, APR1=4.55 vs APR2=2.96; injection drug use, APR1=7.90 vs APR2=4.72). The association between injection drug use and equally feminine/masculine male students decreased and became statistically not significant (APR1=2.76 vs APR2=2.46). Among female students, after controlling for violence victimization, the association between nonconforming gender expression and alcohol use strengthened slightly and became statistically significant (APR1=1.40 vs APR2=1.44). A total of 462 male students and 273 female students were missing data on 1 or more covariates in Model 2. Male (but not female) students with missing covariate data were more likely than those with complete data to be a sexual minority, gender nonconforming, and experience more violence victimization; this may have weakened the ability to identify substance use disparities among male students.

DISCUSSION

Gender nonconformity may have implications for a substantial segment of this population, with approximately 1 in 5 (23.2% of male and 17.5% of female) high school students reported having an equally feminine/masculine or a gender-nonconforming expression. The present findings are consistent with previous research that has shown gender-nonconforming youth experience high rates of harassment and victimization, as well as increased substance use, compared to their gender-conforming peers.[4,5,16–18] A recent study found an elevated prevalence of substance use and bullying experiences among gender minority (included both gender-nonconforming and transgender) adolescents compared with their nongender minority peers, and these substance use disparities appeared to be mediated by bullying experiences.[5]

One of the most interesting findings in this study is the lack of association between gender nonconformity and substance use among female students, despite the strong associations between gender nonconformity and substance use observed among male students. A possible explanation for this finding relies on past research that suggests boys under stress/distress tend to engage in externalizing behaviors such as delinquency and substance use, whereas girls under stress/distress tend to engage in internalizing behaviors such as depression and low self-esteem[26]; however, these findings suggest a different explanation. The data clearly demonstrate that violence victimization is strongly associated with substance use in both female and male students. The reason that gender nonconformity was not associated with substance use in female students may be because gender-nonconforming female students did not experience higher rates of violence victimization than gender-conforming female students; by contrast, among male students, gender nonconformity was

significantly associated with every category of violence victimization. This pattern (gender nonconformity and violence victimization being associated among boys, but not among girls) may also speak to the relationship between violence and cultural misogyny more broadly, wherein all girls and those boys exhibiting feminine traits are victimized disproportionately. This explanation warrants further investigation.

The finding that gender-nonconforming male students were at a greater risk for victimization than gender-nonconforming female students is consistent with past research.[18,20–22] A possible explanation for the relative lack of violence victimizations experienced by gender-nonconforming female students, compared with gender-nonconforming male students, is that male gender roles are more narrowly defined and transgressions are often more harshly sanctioned than those for female gender roles and transgressions. Thus, social harassment and victimization related to gender nonconformity may be more common and intense for male youth than for female youth.[18,20–22]

In addition, research has shown that gender-nonconforming males are more likely to be perceived as sexual minorities than gender-nonconforming females,[20] and, thus, face additional harassment on the basis of perceived or real sexual orientation. One study found that victimization because of perceived or actual lesbian, gay, bisexual, or transgender status fully mediated the association between adolescent gender nonconformity and young adult psychosocial adjustment (i.e., life satisfaction and depression).[27] Thus, theoretically, controlling for sexual identity in the present analyses may have contributed to the lack of associations between gender nonconformity and substance use among female students. Finally, the relative lack of gender-nonconforming female students in the dataset (113 gender-nonconforming female versus 405 gender-nonconforming male students) may have reduced the ability to identify statistically significant associations between gender nonconformity and substance use among female students.

The findings suggest that the experiences of violence victimization may play a role in promoting substance use disparities among gender-nonconforming male students. Among male students, before adjustment for violence victimization experiences, gender-nonconforming male students reported a greater prevalence of prescription drug misuse, use of cocaine, methamphetamine, heroin, and injection drug use than gender-conforming male students. After controlling for violence victimization, the magnitude of these disparities consistently decreased but remained statistically significant. Among male students, a possible explanation for the lack of positive associations between gender nonconformity and cigarette, alcohol, or marijuana use is that the use of these substances is relatively common and accepted among adolescents, and may not require the added stimulus of excessive violence victimization experiences to encourage the use of these substances. Previous research has documented high rates of substance use among other vulnerable and often-stigmatized populations, including sexual minority and transgender youth[11,28–32]. Two studies found evidence that the high rates of harassment and victimization may play a role in mediating these substance use disparities among lesbian, gay, bisexual, or transgender youth.[11,30]

Limitations

School-based YRBS data apply only to youth who attend school, and gender minority and sexual minority youth may be disproportionately represented among the high school dropouts and other youth who do not attend school.[33] Second, the extent of under-reporting or over-reporting of self-reported behaviors cannot be determined; however, the YRBS questionnaire items generally demonstrate good test-retest reliability.[34] One study suggests a small number of "mischievous" youth may falsely report being a sexual minority and engaging in risky health behaviors, including substance use[35]; however, further research is needed for corroboration. Third, the data are cross-sectional and, therefore, provide an indication of association, not causality. Fourth, data on gender identity were not available; therefore, transgender students could not be identified. Fifth, the measure of gender expression presumes a binary construction of gender (i.e., masculine to feminine), rather than recognizing further gender fluidity (i.e., a spectrum of masculinity and a spectrum of femininity). Finally, the relative lack of gender-nonconforming female students in the sample may have limited the ability to identify the associations between gender nonconformity and substance use among female students.

CONCLUSIONS

The findings suggest that some substance use among gender-nonconforming male students may occur in response to the greater prevalence of violence victimizations they experience. Developing support systems within schools and linking school and community resources for gender-nonconforming students may be an important avenue to improve mental health and reduce substance use in this population. Possible interventions include providing safe spaces and school staff contacts who are knowledgeable and supportive of gender-nonconforming students, approaches that have been used successfully with lesbian, gay, bisexual, or transgender youth.[36,37] School staff may benefit from professional development on gender issues, particularly the forms of social stress endured by gender-nonconforming youth, to support these students more competently. Also, health education that includes the discussions about gender and the variety of ways that it is expressed, as well as an improved access to mental health and counseling services, may help to decrease stigma among gender-nonconforming youth. Finally, the findings suggest that efforts to build support systems and reduce victimization among gender-nonconforming students may help reduce disparities in substance use among these youth.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGMENTS

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Table 1.

Prevalence of Gender Nonconformity and Violence Victimization Among High School Students, by Sex

Variable	Male students % (95% CI)	Female students % (95% CI)	Chi-square *p*-value
Gender nonconformity			**<0.001**
Gender nonconforming[a]	13.0 (10.8, 15.5)	4.0 (3.2, 4.9)	
Equally feminine/masculine[b]	10.2 (8.7, 11.9)	13.5 (12.1, 15.0)	
Gender conforming[c]	76.8 (74.1, 79.3)	82.5 (80.7, 84.2)	
Violence victimization			
Felt unsafe at school[d]	6.5 (5.1, 8.2)	6.4 (5.0, 8.0)	0.9018
Threatened/injured with a weapon at school[e]	6.8 (5.5, 8.4)	4.0 (3.0, 5.2)	**<0.001**
Bullied at school[f]	12.8 (11.3, 14.4)	17.7 (15.8, 19.7)	**<0.001**
Electronically bullied[g]	8.2 (6.7, 9.9)	13.7 (12.0, 15.6)	**<0.001**
Forced sexual intercourse[h]	6.6 (5.4, 8.0)	8.1 (6.9, 9.4)	0.0516
Multiple victimization[i]	3.1 (2.4, 4.0)	4.4 (3.5, 5.6)	**<0.05**

Note: Boldface indicates statistical significance ($p<0.05$).

[a]Gender nonconforming: male students who describe themselves as very/mostly/somewhat feminine, and female students who describe themselves as very/mostly/somewhat masculine.

[b]Equally feminine/masculine: male and female students who describe themselves as equally feminine and masculine.

[c]Gender conforming: male students who describe themselves as very/mostly/somewhat masculine, and female students who describe themselves as very/mostly/somewhat feminine.

[d]Did not go to school on one or more of the past 30 days because you felt unsafe at school or on the way to or from school.

[e]Threatened or injured with a weapon on school property, during the past 12 months.

[f]Bullied on school property, during the past 12 months.

[g]Electronically bullied, during the past 12 months (Count being bullied through texting, Instagram, Facebook, or other social media).

[h]Ever physically forced to have sexual intercourse when you did not want to.

[i]Experienced≥3 categories of violence victimization.

Table 2.

Violence Victimization Associations, by Gender Nonconformity Among High School Students

	APR			
	Male students		Female students	
Violence victimization experiences	**%**	**APR (95% CI)**	**%**	**APR (95% CI)**
Felt unsafe at school[a]				
Gender nonconforming[b]	12.0	**2.42 (1.69, 3.46)**	5.3	0.90 (0.29, 2.81)
Equally feminine/masculine[c]	5.0	1.01 (0.57, 1.79)	7.4	1.26 (0.85, 1.87)
Gender conforming[d]	5.0	1.00 (ref)	5.9	1.00 (ref)
Threatened or injured with a weapon at school[e]				
Gender nonconforming[b]	9.1	**1.67 (1.12, 2.48)**	2.2	0.70 (0.20, 2.46)
Equally feminine/masculine[c]	5.8	1.08 (0.62, 1.88)	6.1	**1.97 (1.10, 3.51)**
Gender conforming[d]	5.4	1.00 (ref)	3.1	1.00 (ref)
Bullied at school[f]				
Gender nonconforming[b]	19.6	**1.76 (1.36, 2.28)**	13.8	0.78 (0.47, 1.29)
Equally feminine/masculine[c]	14.7	1.32 (0.96, 1.82)	18.0	1.01 (0.81, 1.27)
Gender conforming[d]	11.2	1.00 (ref)	17.8	1.00 (ref)
Electronically bullied[g]				
Gender nonconforming[b]	18.5	**2.86 (2.18, 3.75)**	12.2	0.94 (0.53, 1.67)
Equally feminine/masculine[c]	7.0	1.09 (0.66, 1.79)	17.6	1.36 (0.99, 1.86)
Gender conforming[d]	6.4	1.00 (ref)	13.0	1.00 (ref)
Forced sexual intercourse[h]				
Gender nonconforming[b]	14.9	**2.93 (2.00, 4.31)**	5.3	0.70 (0.31, 1.56)
Equally feminine/masculine[c]	9.5	1.86 (0.95, 3.63)	7.7	1.02 (0.72, 1.44)
Gender conforming[d]	5.1	1.00 (ref)	7.6	1.00 (ref)

Am J Prev Med. Author manuscript; available in PMC 2021 May 01.

Violence victimization experiences	APR			
	Male students		Female students	
	%	APR (95% CI)	%	APR (95% CI)
Multiple victimization[i]				
Gender nonconforming[b]	7.7	**3.83 (2.26, 6.46)**	3.4	0.83 (0.22, 3.15)
Equally feminine/masculine[c]	2.1	1.03 (0.42, 2.55)	6.5	1.57 (0.96, 2.58)
Gender conforming[d]	2.0	1.00 (ref)	4.1	1.00 (ref)

Note: Boldface indicates statistical significance (95% CI does not include 1.0). Reference group is gender-conforming students. Models adjusted for race/ethnicity, grade, and sexual identity.

[a] Did not go to school on one or more of the past 30 days because you felt unsafe at school or on the way to or from school.

[b] Gender nonconformity: male students who describe themselves as very/mostly/somewhat feminine, and female students who describe themselves as very/mostly/somewhat masculine.

[c] Equally feminine/masculine: male and female students who describe themselves as equally feminine and masculine.

[d] Gender conforming: male students who describe themselves as very/mostly/somewhat masculine, and female students who describe themselves as very/mostly/somewhat feminine.

[e] Threatened or injured with a weapon on school property, during the past 12 months.

[f] Bullied on school property, during the past 12 months.

[g] Electronically bullied, during the past 12 months (Count being bullied through texting, Instagram, Facebook, or other social media).

[h] Ever physically forced to have sexual intercourse when you did not want to.

[i] Experienced≥3 categories of violence victimization.

APR, Adjusted prevalence ratio.

Table 3.

Substance Use Associations, by Gender Nonconformity and Violence Victimization[a] Among High School Students

	APR			
	Model 1		Model 2	
Substance use behaviors	**%**	**APR1 (95% CI)**	**%**	**APR2 (95% CI)**
Male students				
Current cigarette use[b]		Model *n*=2,653		Model *n*=2,561
Gender nonconformity				
Gender nonconforming[c]	7.3	1.28 (0.76, 2.14)	4.9	0.82 (0.47, 1.44)
Equally feminine/masculine[d]	4.3	0.75 (0.40, 1.41)	4.1	0.69 (0.36, 1.34)
Gender conforming[e]	5.7	1.00 (ref)	6.0	1.00 (ref)
Violence victimization[f]				
3 or more			22.1	**5.13 (2.37, 11.10)**
1 or 2			8.4	**1.95 (1.20, 3.14)**
0			4.3	1.00 (ref)
Current alcohol use[b]		Model *n*=2,504		Model *n*=2,414
Gender nonconformity				
Gender nonconforming[c]	21.5	0.90 (0.62, 1.30)	18.3	0.75 (0.50, 1.12)
Equally feminine/masculine[d]	19.4	0.81 (0.59, 1.11)	19.1	0.78 (0.57, 1.06)
Gender conforming[e]	23.9	1.00 (ref)	24.5	1.00 (ref)
Violence victimization[f]				
3 or more			47.6	**2.34 (1.64, 3.34)**
1 or 2			32.1	**1.58 (1.24, 2.02)**
0			20.3	1.00 (ref)
Current marijuana use[b]		Model *n*=2,752		Model *n*=2,636
Gender nonconformity				
Gender nonconforming[c]	17.4	0.82 (0.61, 1.11)	13.7	**0.64 (0.44, 0.94)**

Am J Prev Med. Author manuscript; available in PMC 2021 May 01.

	APR			
	Model 1		Model 2	
Substance use behaviors	%	APR1 (95% CI)	%	APR2 (95% CI)
Equally feminine/masculine[d]	14.3	**0.67 (0.48, 0.95)**	14.6	**0.68 (0.47, 0.98)**
Gender conforming[e]	21.2	1.00 (ref)	21.4	1.00 (ref)
Violence victimization[f]				
3 or more			42.0	**2.48 (1.65, 3.72)**
1 or 2			28.5	**1.68 (1.38, 2.04)**
0			17.0	1.00 (ref)
Prescription drug misuse[g]		Model *n*=2,772		Model *n*=2,645
Gender nonconformity				
Gender nonconforming[c]	20.3	**1.81 (1.23, 2.66)**	17.2	**1.60 (1.06, 2.41)**
Equally feminine/masculine[d]	11.3	1.01 (0.65, 1.58)	10.2	0.95 (0.58, 1.54)
Gender conforming[e]	11.2	1.00 (ref)	10.8	1.00 (ref)
Violence victimization[f]				
3 or more			22.1	**2.11 (1.28, 3.48)**
1 or 2			13.0	1.24 (0.92, 1.67)
0			10.5	1.00 (ref)
Cocaine use[g]		Model *n*=2,754		Model *n*=2,627
Gender nonconformity				
Gender nonconforming[c]	14.3	**2.84 (1.81, 4.45)**	9.3	**1.99 (1.08, 3.66)**
Equally feminine/masculine[d]	6.8	1.36 (0.74, 2.49)	6.7	1.43 (0.74, 2.76)
Gender conforming[e]	5.0	1.00 (ref)	4.7	1.00 (ref)
Violence victimization				
3 or more			17.2	**4.35 (2.19, 8.64)**
1 or 2			8.9	**2.25 (1.47, 3.46)**
0			4.0	1.00 (ref)
Methamphetamine use[g]		Model *n*=2,771		Model *n*=2,645

Substance use behaviors	APR			
	Model 1		Model 2	
	%	APR1 (95% CI)	%	APR2 (95% CI)
Gender nonconformity				
Gender nonconforming[c]	12.9	**4.47 (2.64, 7.55)**	7.4	**2.86 (1.48, 5.50)**
Equally feminine/masculine[d]	5.5	1.92 (0.82, 4.50)	4.8	1.87 (0.73, 4.76)
Gender conforming[e]	2.9	1.00 (ref)	2.6	1.00 (ref)
Violence victimization				
3 or more			19.4	**9.75 (4.74, 20.07)**
1 or 2			6.1	**3.06 (1.76, 5.32)**
0			2.0	1.00 (ref)
Heroin use[g]		Model *n*=2,780		Model *n*=2,653
Gender nonconformity				
Gender nonconforming[c]	9.2	**4.55 (2.44, 8.46)**	5.2	**2.96 (1.37, 6.40)**
Equally feminine/masculine[d]	2.5	1.25 (0.56, 2.75)	1.7	0.96 (0.38, 2.45)
Gender conforming[e]	2.0	1.00 (ref)	1.8	1.00 (ref)
Violence victimization				
3 or more			13.7	**12.16 (5.37, 27.57)**
1 or 2			4.2	**3.72 (2.02, 6.86)**
0			1.1	1.00 (ref)
Injection drug use[g]		Model *n*=2,782		Model *n*=2,660
Gender nonconformity				
Gender nonconforming[c]	7.6	**7.90 (4.26, 14.65)**	4.2	**4.72 (1.94, 11.48)**
Equally feminine/masculine[d]	2.6	**2.76 (1.23, 6.21)**	2.2	2.46 (1.00, 6.04)
Gender conforming[e]	1.0	1.00 (ref)	0.9	1.00 (ref)
Violence victimization				
3 or more			3.8	**4.12 (1.04, 16.27)**
1 or 2			3.1	**3.39 (1.51, 7.59)**

	APR			
	Model 1		Model 2	
Substance use behaviors	**%**	**APR1 (95% CI)**	**%**	**APR2 (95% CI)**
0			0.9	1.00 (ref)
Female students				
Current cigarette use[b]		Model *n*=2,644		Model *n*=2,579
Gender nonconformity				
Gender nonconforming[c]	3.0	0.93 (0.40, 2.19)	3.6	1.20 (0.52, 2.77)
Equally feminine/masculine[d]	3.5	1.09 (0.54, 2.20)	3.5	1.16 (0.55, 2.45)
Gender conforming[e]	3.3	1.00 (ref)	3.0	1.00 (ref)
Violence victimization[f]				
3 or more			**10.8**	**4.40 (2.01, 9.62)**
1 or 2			3.3	1.36 (0.76, 2.43)
0			2.5	1.00 (ref)
Current alcohol use[b]		Model *n*=2,486		Model *n*=2,428
Gender nonconformity				
Gender nonconforming[c]	37.3	1.40 (0.95, 2.07)	38.3	**1.44 (1.01, 2.05)**
Equally feminine/masculine[d]	22.2	0.83 (0.66, 1.06)	22.0	0.83 (0.65, 1.06)
Gender conforming[e]	26.6	1.00 (ref)	26.6	1.00 (ref)
Violence victimization[f]				
3 or more			61.0	**2.59 (2.12, 3.15)**
1 or 2			29.0	1.23 (0.95, 1.60)
0			23.6	1.00 (ref)
Current marijuana use[b]		Model *n*=2,689		Model *n*=2,615
Gender nonconformity				
Gender nonconforming[c]	26.4	1.51 (0.96, 2.38)	27.0	1.55 (1.00, 2.38)
Equally feminine/masculine[d]	19.4	1.11 (0.78, 1.58)	19.3	1.11 (0.77, 1.60)

	APR			
	Model 1		Model 2	
Substance use behaviors	**%**	**APR1 (95% CI)**	**%**	**APR2 (95% CI)**
Gender conforming[e]	17.4	1.00 (ref)	17.5	1.00 (ref)
Violence victimization[f]				
3 or more			37.2	**2.36 (1.67, 3.32)**
1 or 2			21.3	**1.35 (1.04, 1.73)**
0			15.8	1.00 (ref)
Prescription drug misuse[g]		Model *n*=2,708		Model *n*=2,631
Gender nonconformity				
Gender nonconforming[c]	8.9	0.91 (0.44, 1.90)	9.5	0.97 (0.48, 1.94)
Equally feminine/masculine[d]	10.2	1.04 (0.65, 1.69)	9.9	1.01 (0.60, 1.68)
Gender conforming[e]	9.8	1.00 (ref)	9.8	1.00 (ref)
Violence victimization[f]				
3 or more			25.0	**3.12 (1.98, 4.93)**
1 or 2			11.7	**1.47 (1.08, 1.99)**
0			8.0	1.00 (ref)
Cocaine use[g]		Model *n*=2,697		Model *n*=2,622
Gender nonconformity				
Gender nonconforming[c]	4.8	1.17 (0.43, 3.19)	5.6	1.48 (0.58, 3.77)
Equally feminine/masculine[d]	4.6	1.12 (0.53, 2.38)	4.6	1.19 (0.55, 2.60)
Gender conforming[e]	4.1	1.00 (ref)	3.8	1.00 (ref)
Violence victimization[f]				
3 or more			13.1	**4.66 (2.32, 9.35)**
1 or 2			5.6	**2.00 (1.17, 3.41)**
0			2.8	1.00 (ref)
Methamphetamine use[g]		Model *n*=2,705		Model *n*=2,630
Gender nonconformity				

Substance use behaviors	APR			
	Model 1		Model 2	
	%	APR1 (95% CI)	%	APR2 (95% CI)
Gender nonconforming[c]	1.6	0.80 (0.22, 2.88)	2.1	1.19 (0.34, 4.12)
Equally feminine/masculine[d]	2.2	1.05 (0.42, 2.63)	2.3	1.29 (0.52, 3.20)
Gender conforming[e]	2.1	1.00 (ref)	1.8	1.00 (ref)
Violence victimization[f]				
3 or more			8.3	**7.68 (2.80, 21.01)**
1 or 2			2.7	**2.48 (1.20, 5.12)**
0			1.1	1.00 (ref)
Heroin use[g]		Model *n*=2,710		Model *n*=2,634
Gender nonconformity				
Gender nonconforming[c]	0.8	0.56 (0.13, 2.48)	1.2	1.06 (0.23, 4.91)
Equally feminine/masculine[d]	0.5	0.35 (0.10, 1.26)	0.4	0.38 (0.12, 1.25)
Gender conforming[e]	1.4	1.00 (ref)	1.1	1.00 (ref)
Violence victimization[f]				
3 or more			6.6	**18.32 (6.04, 55.56)**
1 or 2			1.4	**3.90 (1.54, 9.86)**
0			0.4	1.00 (ref)
Injection drug use[g]		Model *n*=2,714		Model *n*=2,641
Gender nonconformity				
Gender nonconforming[c]	1.1	0.66 (0.08, 5.61)	1.4	0.92 (0.10, 8.30)
Equally feminine/masculine[d]	1.1	0.70 (0.26, 1.90)	0.9	0.58 (0.19, 1.75)
Gender conforming[e]	1.6	1.00 (ref)	1.5	1.00 (ref)
Violence victimization[f]				
3 or more			9.2	**14.14 (5.57, 35.89)**
1 or 2			1.6	2.48 (0.98, 6.28)

	APR			
	Model 1		Model 2	
Substance use behaviors	**%**	**APR1 (95% CI)**	**%**	**APR2 (95% CI)**
0			0.6	1.00 (ref)

Note: Boldface indicates statistical significance (95% CI does not include 1.0). Reference groups are gender-conforming students and students with no violence victimization experiences. Model 1: APR 1 is adjusted for race/ethnicity, grade, sexual identity. Model 2: APR 2 is adjusted for race/ethnicity, grade, sexual identity, violence victimization.

[a]Violence victimization categories include: (1) not going to school on one or more of the past 30 days because you felt unsafe at school or on the way to or from school; (2) being threatened or injured with a weapon on school property, during the past 12 months; (3) being bullied on school property, during the past 12 months; (4) being electronically bullied, during the past 12 months (Count being bullied through texting, Instagram, Facebook, or other social media); (5) ever being physically forced to have sexual intercourse when you did not want to.

[b]Past 30 days.

[c]Gender nonconforming: male students who describe themselves as very/mostly/somewhat feminine, and female students who describe themselves as very/mostly/somewhat masculine.

[d]Equally feminine/masculine: male and female students who describe themselves as equally feminine and masculine.

[e]Gender conforming: male students who describe themselves as very/mostly/somewhat masculine, and female students who describe themselves as very/mostly/somewhat feminine.

[f]The number of categories of violence victimization experienced.

[g]Ever.

APR, adjusted prevalence ratios.