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RESEARCH ARTICLE

Substance Use Among Transgender Students in California Public Middle and High Schools*

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ABSTRACT

BACKGROUND: Transgender adolescents face tremendous social stress in families and schools, which often leads to behavioral health disparities. This study assessed whether rates of substance use were higher among transgender adolescents when compared to nontransgender adolescents.

METHODS: This study is a secondary data analysis of the 2013-2015 California Healthy Kids Survey (CHKS) that examines whether rates of substance use are higher among transgender youth when compared to nontransgender youth. Participants included 4778 transgender and 630,200 nontransgender students in middle and high schools in nearly all school districts in California. The study outcomes were lifetime, recent, and in-school use of cigarettes, tobacco, alcohol, marijuana, cocaine, and ecstasy as well as nonmedical use of prescription painkillers, diet pills, Ritalin or Adderall, and cold medicine.

RESULTS: Transgender students were about 2-1/2 times more likely as nontransgender students to use cocaine/methamphetamine in their lifetime (odds ratio [OR] = 2.53; 95% confidence interval [CI] = 2.18-2.95) and about 2.8 times as likely to report past 30-day inhalant use (OR = 2.80; 95% CI = 2.41-3.26). Transgender students were more than twice as likely to report past 30-day prescription pain medication use (OR = 2.19; 95% CI = 1.90-2.53) and more than 3 times as likely to use cigarettes in school (OR = 3.37; 95% CI = 2.84-3.99).

CONCLUSIONS: The study's findings indicate a need for community- and school-based interventions that reduce substance use among transgender youth.

Keywords: transgender youth; substance use; illicit drug use; cigarette use; cocaine use; alcohol use; prescription pain medication.

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For all adolescents in the United States, substance use is a serious public health issue. Data from the 2013 Youth Risk Behavior Surveillance Survey reported that 15.6% of students recently smoked cigarettes and 8.8% used tobacco. In addition, the survey reported that 66.2% of students had at least 1 drink of alcohol in their lifetime, and 34.9% reported at least 1 drink of alcohol in the past 30 days. In addition, 40.7% of students reported using marijuana 1 or more times in their lifetime.[1]

Substance use during adolescence has adverse social, physical, emotional, and public health costs. Tobacco and cigarette use, for instance, are major factors contributing to an array of preventable diseases during adulthood.[2-4] Furthermore, drinking can have far-reaching consequences for adolescents.[5-8] These include critical injuries from motor vehicle crashes and serious long-term health issues. Use of other drugs, such as marijuana and illicit drugs as well as nonmedical use of prescription pain killers, Ritalin, Adderall, and inhalants, can have long-term medical and social implications well into adulthood.[9-12] Drug use during adolescence has been associated with teenage pregnancy, sexually transmitted infections, crime, suicidal ideation, and substance dependence, all of which can impede long-term academic and

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professional aspirations and well-being across the lifespan.[13,14]

Few studies have focused solely on transgender adolescents and substance use. Transgender youth are a particularly vulnerable population in schools and communities in the United States.[15-17] Numerous studies have uncovered an array of health and well-being issues among transgender adolescents, including elevated rates of depression, suicidal ideation, sexual risk behaviors, and self-mutilation.[18,19] When compared with their peers in schools, transgender students have reported higher rates of physical victimization, verbal harassment, and cyberbullying, as well as lower social support from peers and school staff.[20]

Some studies have found significantly higher rates of alcohol, cigarette, and marijuana use among transgender youth, when compared with nontransgender peers.[17,21] Drawing from a community sample of male-to-female transgender adolescents, 1 study found that 65% reported recent alcohol use, 71% for marijuana, and 23% for nonmarijuana illicit drugs. These rates are higher than national rates from the 2013 Youth Risk Behavior Surveillance Survey, which showed that 23.4% of high schools students reported past 30-day marijuana use, 34.9% for alcohol use, and below 10% for an array of illicit drugs (ie, heroin, cocaine, methamphetamine, hallucinogenic drugs).[21] Research drawing from a large national study—the Teen Health and Technology Study—found that gender minority youth when compared with cisgender peers were more likely to report past-month alcohol use, marijuana use, and other illicit drug use.[17] Past 12-month bullying and harassment also were associated with increased odds of the 3 substance use indicators.[17]

Research on substance use among transgender adolescents is still in its nascent stages. To date, there are no known studies examining rates of other drugs among transgender adolescents such as nonmedical use of prescription pain medication, inhalants, diet pills, Attention Deficit Hyperactivity Disorder (ADHD) medication (ie, Ritalin, Adderrall) and cold medicine and illicit drugs such as ecstasy and cocaine. Given the need for more research on transgender youth and substance use, this study draws from a large statewide sample of adolescents to examine whether transgender adolescents have higher rates of alcohol, cigarette, and marijuana use. In addition, this study explores whether transgender adolescents have higher rates of cocaine and ecstasy use as well as nonmedical use of prescription painkillers, diet pills, Ritalin or Adderall, and cold medicine, when compared with nontransgender peers in the same schools.

California is a unique context for exploring substance use among transgender adolescents. First, California is one of the most racially, culturally, and socioeconomically diverse states in the United States. More than half of California public middle and high school students are nonwhite.[22] Second, major Lesbian, Gay, Bisexual, and Transgender (LGBT) youth advocates consider California state educational policies to be supportive of transgender youth in schools, when compared to other states. California state education code, for example, requires all schools to have LGBT inclusive curriculum and implement antibullying policies that specifically address harassment and violence aimed at transgender students.[23] These policy requirements may play a role in making school environments safe and supportive for transgender students. In general, as a result of California's cultural diversity and supportive educational policy context, rates of substance use may differ among transgender adolescents, when compared to other contexts. Hence, this study explores substance use outcomes among transgender adolescents in California middle and high schools.

This study conducted a secondary analysis of data from the 2013 to 2015 statewide administration of the CHKS to compare rates of substance use among transgender and nontransgender students. California is the one of a few state school health surveys that asks students whether they are transgender, permitting analyses that disaggregate transgender students and nontransgender peers in California schools. Given that research indicates elevated social stressors among transgender youth, we hypothesized that when compared to nontransgender peers, transgender adolescents would report higher rates of lifetime, recent, and in-school use of cigarettes, tobacco, alcohol, marijuana, cocaine, and ecstasy as well as nonmedical use of prescription painkillers, diet pills, Ritalin or Adderall, and cold medicine.

METHODS

Participants and Procedures

The CHKS was developed by West Ed under contract to the California Department of Education. The data utilized in this study are from the 2013 to 2015 administration of the CHKS. The CHKS is the largest statewide survey of elementary, middle, and high school students' perceptions of resilience, health risk behaviors, and school climate in the United States. The CHKS is administered biennially to public school students in 5th, 7th, 9th, and 11th grade students by the California Department of Education and WestEd, a nonprofit research, development and service agency.[24]

The California Department of Education requires that each school district survey a representative district-wide grade-level sample of students in the 5th, 7th, 9th, and 11th grades.[25] Fifth grade participants were excluded from this study, because they were not asked detailed questions about substance use. Each school district obtained parental consent for each participant prior to survey administration. District-level consent procedures were followed. The

sample for this study included 634,978 students in 7th, 9th, and 11th grades.

Measures

Independent variables and control variables. Students were defined as transgender if they marked ''transgender'' to the following question: ''Which of the following best describes you?'' This study included control variables, known to be associated with substance use. These included race (American Indian, black, Latino, white, Asian/Pacific Islander, and mixed race), educational level of the parent who went farthest in school (less than high school, high school graduate, some college, college graduate), and grade level (7th, 9th, 11th). Students reported the educational level of the parent who went the farthest in school.

Dependent variables. Students were asked to report lifetime and past 30-day substance use, and substance use in school during the past 30 days. All substance use items were treated as dichotomous variables with students reporting whether or not they had used each item in their life, in the past 30 days, and on school property during the past 30 days. Substances assessed included alcohol, tobacco, cigarettes, marijuana, inhalants, prescription painkillers, and others. The prescription drug category included Vicodin, OxyCotin, Percodan, Lortab, tranquilizers, or sedatives (Xanax, Ativan).

Data Analysis

Analyses were conducted using IBM SPSS Version 23. Bivariate and multivariate analyses were conducted to address the study's objectives. Chi-square tests of association were conducted to compare rates of substance use between transgender and nontransgender students. A series of multivariate regression analyses were conducted for each of the substance use variables. These regression models controlled for race, grade level, and parent educational level. The dependent variables in this study were dichotomous, and thus, logistic regression analyses were conducted.

RESULTS

As Table 1 shows, the sample was almost evenly split by grade level. A total of 32.9% of the sample was in the 7th grade, whereas 35.2% were in 9th grade, and 31.9% in 11th grade. The sample of students reflects racial diversity, expected in California. More than three fourths of the sample (72.7%) is nonwhite. Hispanic students comprise the largest racial/ethnic group in the sample (50.3%), whereas Asian and Pacific Islander students comprise 8.2% and black students comprise 3.0% of the sample. About 0.8% of students in the sample report being transgender.

Table 1. **Overall Sample Characteristics (N = 634,978)**

	Total (N = 634,978)	Transgender (N = 4778) (0.8%)	Nontransgender (N = 630,200) (99.2%)
Grade			
7th	32.9	32.3	40.6
9th	35.2	35.4	33.6
11th	31.9	32.3	25.8
Race/ethnicity			
Asian/PI	8.2	7.9	12.1
American Indian	1.0	1.6	1.0
Black	3.0	2.5	7.2
White	27.3	27.3	25.6
Mixed race	11.1	10.3	18.1
Hispanic	50.3	52.0	36.9
Parent education			
Less than high school	17.1	18.8	17.1
High school graduate	19.7	18.3	19.7
Some college	15.6	16.1	15.6
College graduate	47.6	46.8	47.6

Students were also asked to report the educational level of the parent that went farthest in school. About 17.1% of students reported less than high school, 19.7% reported a high school graduate, and 47.6% reported a college graduate.

Bivariate analyses were then conducted to assess lifetime, past 30-day, and in-school rates of cigarettes, tobacco, alcohol, and marijuana use among transgender and nontransgender students. Significant bivariate associations were found between transgender identity and almost all substance use variables. For instance, as Table 2 shows, transgender students reported significantly higher rates of cocaine/methamphetamine and ecstasy use as well as nonmedical use of diet pills, Ritalin or Adderall, and cold medicine. Compared to nontransgender students, transgender students also reported significantly higher rates of past 30-day use of marijuana (22.6%), inhalants (30%), and prescription pain medication (14.6%).

Multivariate Analyses

Multivariate logistic regression analyses indicated an increased odds of substance use among transgender youth in almost all models (Table 2). Among lifetime substance use models, transgender students had a 78% increased likelihood of inhalants use (AOR = 1.78; 95% CI = 1.58-2.00) and an 89% increased likelihood of ecstasy use (AOR = 1.89; 95% CI = 1.64-2.18). In addition, transgender youth were about 2-1/2 times as likely as nontransgender students to report cocaine/methamphetamine use (AOR = 2.53; 95% CI = 2.18-2.95), and had a 93% increased likelihood of reporting Ritalin or Adderall use (AOR = 1.93; 95% CI = 1.68-2.22). Among the past 30-day substance

Table 2. **Substance Use Among Transgender and Nontransgender Youth (N = 634,770)**

Variable	Overall (%)	Transgender (%)	Nontransgender (%)	Adjusted Odds Ratios
Lifetime substance use				
Cigarettes*	59,384 (9.4)	21.5	9.3	1.61 (1.45-1.79)
Tobacco*	23,554 (3.7)	11.8	3.7	1.72 (1.50-1.97)
Alcohol*	191,524 (30.3)	42.0	30.2	1.18 (1.09-1.28)
Marijuana*	131,586 (20.8)	33.1	20.7	1.32 (1.21-1.45)
Inhalants*	33,925 (5.4)	14.8	5.3	1.78 (1.58-2.00)
Cocaine/Methamphetamine*	14,525 (3.4)	13.1	3.3	2.53 (2.18-2.95)
Ecstacy*	21,434 (5.0)	14.5	4.9	1.89 (1.64-2.18)
Prescription painkillers*	53,507 (12.4)	23.2	12.3	1.47 (1.32-1.64)
Diet pills*	23,213 (5.4)	13.3	5.3	1.64 (1.43-1.88)
Ritalin or Adderrall*	18,811 (4.4)	12.9	4.3	1.93 (1.68-2.22)
Cold medicine*	167,382 (39.0)	40.0	39.0	.85 (.78-.93)
Other drug*	34,325 (8.0)	18.6	7.9	1.64 (1.46-1.86)
Past 30-day substance use				
Cigarettes*	24,625 (3.9)	14.0	3.8	2.14 (1.89-2.44)
Tobacco*	9947 (1.6)	8.9	1.5	2.48 (2.11-2.93)
Alcohol (1 drink)*	102,614 (16.3)	27.0	16.2	1.27 (1.15-1.39)
Alcohol (5 or more drinks)*	53,230 (8.4)	18.9	8.4	1.49 (1.33-1.66)
Marijuana*	69,021 (10.9)	22.6	10.8	1.54 (1.39-1.70)
Inhalants*	12,032 (1.9)	10.7	1.8	2.80 (2.41-3.26)
Prescription pain medication*	16,129 (3.8)	14.6	3.7	2.19 (1.90-2.53)
Other drugs*	16,003 (2.5)	11.9	2.5	2.44 (2.12-2.81)
2 or more drugs*	25,255 (5.9)	16.6	5.8	1.74 (1.51-1.99)
Substance use in school				
Cigarettes*	7598 (1.2)	9.6	1.1	3.37 (2.84-3.99)
Tobacco*	6763 (1.1)	8.5	1.0	3.08 (2.58-3.69)
Alcohol*	22,436 (3.6)	13.8	3.5	2.14 (1.87-2.44)
Marijuana*	11,072 (1.8)	10.9	1.7	2.88 (2.47-3.36)
Other illegal drugs	377,013 (60.0)	61.0	60.0	1.04 (.97-1.13)

*$p < .01$.

use models, transgender students were about 2-1/2 times as likely to report tobacco use (AOR = 2.48; 95% CI = 2.11-2.93), and about 2.8 times as likely to report inhalants use (AOR = 2.80; 95% CI = 2.41-3.26), and more than twice as likely to use prescription pain medication (AOR = 2.19; 95% CI = 1.90-2.53).

The results indicated significant odds ratios in the in-school models. For example, when compared to nontransgender peers, transgender students were more than 3 times as likely to report cigarette use (AOR = 3.37; 95% CI = 2.84-3.99) and more than twice as likely to drink alcohol in school (AOR = 2.14; 95% CI = 1.87-2.44). In addition, transgender students were almost 3 times as likely as nontransgender youth to use marijuana in school (AOR = 2.88; 95% CI = 2.47-3.36).

DISCUSSION

Recently, the National Institutes of Health LGBT Strategic Plan, the Society for Research on Child Development (SRCD), and the American Educational Research Association have advocated for more knowledge on the health and well-being of transgender youth. This is the first large-scale statewide study of behavioral health disparities among transgender adolescents, documenting statewide substance use rates among transgender youth in California. LGBT advocates consider California's school policies as supportive of transgender students. For instance, recent state mandates require schools to include transgender students in extracurricular activities, such as sex-segregated team sports and implement enumerated antibullying policies, where school staff have clear procedures for addressing harassment aimed at transgender students.[23] Despite state educational policies aimed at improving the well-being of transgender youth in schools, this study illustrates that substance use remains a concerning behavioral health problem among California transgender students.

This study indicated elevated lifetime, recent, and in-school substance use rates among transgender youth, compared to nontransgender peers. These findings support results from a study that found higher rates of lifetime and recent alcohol, cigarette, and marijuana use among transgender youth compared to their peers among a smaller sample of transgender youth.[17] In addition to a significantly larger sample size, this study presented the first findings of other illicit drugs and misuse of prescription drugs. The results showed an increased likelihood of

cocaine/methamphetamine use and the use of drugs commonly found in households, such as prescription pain medication, diet pills, cold medicine, Ritalin, Adderall, and Inhalants, among transgender youth. Overall, the results of this study add to a growing literature on behavioral health disparities among transgender youth as well as the need for school and community-based substance use prevention programs to account for transgender youth as an at-risk group.

Recent scholarship has utilized a gender minority stress perspective to explain elevated rates of substance use and other behavioral health disparities among transgender adolescents.[17] This perspective posits that distal social stressors in the school, family, and community contexts, such as parental rejection and abuse, disproportionately affect gender minorities when compared with cisgender peers.[17] Social stressors in schools such as physical victimization, verbal harassment, and cyberbullying are significantly higher for transgender students; moreover, research also has noted markedly lower levels of social support from peers and school staff among transgender youth.[15,26] In addition, transgender students may experience, proximal stressors, such as internalized transphobia and anticipated stigma.[17] Transgender students may engage in substance use as an avoidance or coping strategy.

Limitations

As with all studies, this study has limitations that should be considered when interpreting results. First, due to the cross-sectional nature of this study, cause-and-effect relationships could not be assessed. Second, the CHKS is comprised of self-reported items. Students may have been hesitant to report substance use; however, error in reporting substance use may have occurred for both transgender and nontransgender participants to a similar extent. Hence, the odds ratios for transgender youth may be an undervalued. Third, SES in this study was captured by parent educational attainment, specifically the educational attainment level of the parent who went furthest in school. The CHKS does not include other measures of SES, such as household income level. Fourth, this study utilized data from a statewide sample of youth throughout California middle and high schools, a diverse, racial and cultural context, which is unique from other geographic regions. It should be noted that the results of this study resemble recent studies drawing from nationally representative samples and community samples from other regions throughout the United States. Finally, the CHKS item measuring transgender identity was limited, as it did not capture different subgroups within the transgender community, including male-to-female, female-to-male, gender queer, bigender, gender fluid, and gender nonconforming. Future studies could assess more subgroups within the transgender identity umbrella. Other terms such as trans*, gender creative, gender diverse, and gender independent have also recently been utilized by transgender people.[27]

IMPLICATIONS FOR SCHOOL HEALTH

Gender minority stress scholars have illustrated that the challenges and stressors that transgender students experience in schools, families, and communities often result in the use of cigarette, alcohol, and other drugs as coping.[17] School health professionals and other school staff play critical roles in preventing substance use among transgender students by supporting their health and well-being during life challenges and physical transitions. Caring and trans-affirming school health professionals, for instance, could provide appropriate health care for transgender students, who are undergoing physical and social transitions as well as emotional support for transgender students as they experience parental rejection and peer harassment.

Often, a school health professional is one of few potentially caring and affirming adults in the life of a transgender adolescent. Thus, there is a need for providing preservice and in-service training that equips school health providers, counselors, and psychologists with evidence-based strategies that support the health and well-being of transgender youth. For example, they could be trained in understanding basic concepts of biological sex, gender, gender identity, and expression so that they can build caring and respectful relationships with transgender students. School health providers could also learn about the wide spectrum of transgender identities as it relates to their health and well-being. Whereas some transgender students may undergo hormone replacement therapy, other students may express their gender identities differently, contrary to gender role expectations. Moreover, school nurses, counselors, and psychologists also could connect transgender students and their families with local nonprofit organizations and agencies. Local LGBT community centers, for instance, often provide low cost health, drug prevention, and mental health care services as well as support groups for transgender youth and their families.

School health professionals also could collaborate with administrators and teachers to create a positive and affirming school climate for transgender students. A positive and caring school climate plays a critical role in supporting transgender students in times of crisis, preventing substance use as means of coping.[28,29] In addition, schools could take steps in creating safe schools for transgender youth, reducing bullying and other school risk factors that can exacerbate substance use among transgender students. The SRCD outlined 4 major elements of safe and caring school

environments known to promote the safety and well-being of sexual minority and gender nonconforming youth: (1) school nondiscrimination and antibullying policies that enumerate or specifically include actual or perceived sexual orientation or gender identity or expression, (2) teacher intervention when harassment takes place, and training of teaches on effective intervention strategies, (3) presence of school-based support groups or clubs, (4) inclusion of LGBT people or issues in school curricula and access to information and resources through the library, school-based health centers, and other avenues.[30]

School health professionals also can use local data to monitor the substance use outcomes of transgender students. The California Department of Education (CDE) has administered the CHKS to middle and high school students in every school district since the 1980s.[24] The CHKS collects information about health behaviors, perceptions of school support, bullying, suicidal ideation, and other behavioral health outcomes. The CDE in collaboration with WestEd distributes district- and school-level reports, so that schools can make informed decisions about acquiring appropriate school-based interventions. Since 2013, the CHKS has an item identifying transgender students. School health professionals, administrators and other school staff now have the capability to monitor the substance use and other health risk outcomes of transgender students. These data could potentially drive decisions for how better to support transgender students.

This is the first large-scale, statewide study that explores substance use rates among transgender youth. Our findings suggest that transgender youth experience tremendous stress in multiple social contexts. Abuse and neglect in the family context are major contributors to elevated substance use rates among transgender youth. Future research could explore family risk factors as well as other contributing and mitigating factors within schools and communities. Our findings illustrate a need for preparing school health professionals to support transgender students as they cope with multiple stressors in schools, families, and communities.

Human Subjects Approval Statement

This study involved secondary analyses of existing publicly available data with no identifiers provided by the California Department of Education and WestEd. Therefore, this study did not require oversight or review by the Institutional Review Board.

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Did you know?

The American Academy of Pediatrics Council on School Health recently selected three articles from the 2015 volume of the *Journal of School Health* for its Top Ten list of "must read" articles published in 2015. Check out these articles – the *Journal of School Health* – your best source for staying up-to-date in school health!

Michael SL, Merlo CL, Basch CE, Wentzel KR, Wechsler KR. Critical connections: health and academics. *J Sch Health*. 2015;85(11):740-758.

Taber DR, Chriqui JF, Powell LM, Perna FM, Robinson WR, Chaloupka JF. Socioeconomic differences in the association between competitive food laws and the school food environment. *J Sch Health*. 2015;85(9):578-586.

Borawski EA, Tufts KA, Trapl ES, Hayman LL, Yoder LD, Lovegreen JD. Effectiveness of health education teachers and school nurses teaching sexually transmitted infections/human immunodeficiency virus prevention knowledge and skills in high school. *J Sch Health*. 2015;85(3):189-196.

Source: American Academy of Pediatrics. (http://www2.aap.org/sections/schoolhealth/mustread.htm)