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Transgender-related Discrimination and Substance Use, Substance Use Disorder and Treatment History among Transgender Adults

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Abstract

Background: Substantial research gaps exist regarding the relationship between transgender-related discrimination and substance use outcomes for transgender adults, with few studies accounting for other experiences of victimization.

Methods: Transgender adults (N = 600) from Massachusetts and Rhode Island completed a survey online or in-person. Multivariable linear and logistic regression models examined the association between lifetime experiences of transgender-related discrimination using the validated 11-item Everyday Discrimination Scale (theoretical range = 0–44) and substance use outcomes: past 12-month substance use frequency, lifetime substance use disorder (SUD) diagnosis, and substance use treatment (SUTx) history. All models were adjusted for age, gender identity, race, survey modality, childhood physical/sexual abuse, intimate partner violence, and non-transgender-related discrimination.

Results: The mean transgender-related discrimination score was 20.8 (SD = 9.6, range = 0–44). Overall, 11.8% of the sample had a SUD diagnosis and 11.0% had received SUTx. In separate multivariable models adjusted for sociodemographic and victimization experiences, the highest quartile of transgender-related discrimination was significantly associated with higher past 12-month substance use (B = 1.44; aR^2 = 0.13; p = .009), SUD diagnosis (aOR = 3.64; 95% CI = 1.46–9.07; p = .006), and lifetime treatment history (aOR = 3.93; 95% CI = 1.50–10.21; p = .005).

Conclusions: There was a significant positive association between experiencing high levels of transgender-related discrimination and substance use outcomes among the transgender adults sampled. Longitudinal research is needed to understand the specific mediators driving these relationships and to address transgender-related discrimination and implications for substance use and SUD treatment utilization.

Keywords

1. Introduction

Transgender people—individuals whose gender identity differs from their sex assigned at birth— face disproportionately higher rates of discrimination, violence and other forms of stigma relative to cisgender (non-transgender) individuals (Bockting et al., 2013; Bradford et al., 2013; James et al., 2016; White Hughto et al., 2015). Transgender-related discrimination, also known as enacted stigma, refers to prejudicial treatment on the basis of one's gender identity, including perceived identity, voluntary and involuntary disclosure, and gender expression (i.e. appearance and behavior-related). Discrimination exists in many forms including verbal harassment, threats, and name-calling, and often presents in everyday interactions, such as receiving poorer treatment and being treated with less courtesy (Essed, 1990).

Enacted forms of discrimination have a direct impact on the health of transgender people (White Hughto et al., 2015). Indeed, accumulating research finds that transgender-related discrimination can impede access to health-promoting including healthcare, housing, and

employment (James et al., 2016; Rodriguez et al., 2018; White Hughto et al., 2015). Transgender individuals have a high risk of experiencing numerous forms of violence and are often subject to repeated victimization (Stotzer, 2009). Furthermore, physical and sexual violence is especially prevalent and often starts in younger ages, compounding experiences of discrimination (Stotzer, 2009).

Transgender discrimination is associated with a variety of adverse mental and behavioral health outcomes including posttraumatic stress disorder (Reisner et al., 2016), depression (Williams et al., 2017), suicide attempts (Clements-Nolle et al., 2006) and substance use (Bradford et al., 2013; Clements-Nolle et al., 2006). Research finds that substance use is highly prevalent among transgender individuals. In the largest survey of almost 28,000 transgender individuals, 29% of the sample reported current illicit drug use, including marijuana and intentional misuse of prescription drugs, compared to 10% of the general U.S. population (James et al., 2016).

Conceptual frameworks developed from minority stress theories posit that harmful substance use behaviors result from stigmatizing attitudes and behaviors expressed toward transgender individuals (Hendricks and Testa, 2012; Reisner et al., 2014b; White Hughto et al., 2015). Previous empirical findings show substance use has been identified as a mechanism to cope with the societal stigma and the enacted forms of discrimination that a majority of transgender individuals experience (Bradford et al., 2013; Coulter et al., 2018; Felner et al., 2020; Fontanari et al., 2019; Reisner et al., 2014b). Indeed, one study investigating the relationship between transgender-related discrimination and the health behaviors of transgender people in Virginia found that experiencing discrimination as a result of one's gender identity or gender expression was associated with the higher odds of both illicit and non-illicit substance use (Bradford et al., 2013). Notably, however, this study only included alcohol, tobacco, and injection drug use in the substance use outcome and excluded other substances that are often used to get high such as prescription drugs. Other studies have explored the relationship between discrimination and substance use among subsets of the transgender population including trans feminine people (individuals assigned a male sex at birth that identify as women, transgender women, or another gender identity along the male-to-female gender spectrum) (Hoffman, 2014; Keuroghlian et al., 2015; Nuttbrock et al., 2014; Reisner et al., 2014b; Wolf and Dew, 2012) or transgender youth and young adults (Felner et al., 2020; Fontanari et al., 2019; Rowe et al., 2015). Although these studies draw links between discrimination and substance use behaviors, there is no consensus on how substance use is measured and operationalized across transgender samples. Furthermore, given the multitude of victimization experiences that transgender individuals may disproportionately encounter (Stotzer, 2009; White Hughto et al., 2015), no previous studies have controlled for other reasons for experiencing discrimination, in addition to histories of child abuse and intimate partner violence that could directly cause or confound substance use behaviors.

In light of increased risk for substance use behaviors, transgender individuals also have a higher risk of developing a substance use disorder (SUD) compared to the general population (Flentje et al., 2014). A recent national study of individuals with commercial insurance found that 4.3% of the transgender sample had a drug use disorder diagnoses

compared to just 1.2% of cisgender individuals (Hughto et al., 2021). Studies using electronic health record (EHR) data have found a SUD prevalence ranging from 10% in adults (Wanta et al., 2019) to 14–15% in a sample of adults and adolescents (Quinn et al., 2017). However, these may be conservative estimates of the true burden of SUD among transgender people considering that many transgender people with a SUD may not actually receive a diagnosis due the plethora of healthcare access barriers faced by this population, including the avoidance of needed care due to the fear of discrimination (Bradford et al., 2013; Reisner et al., 2015a; White Hughto et al., 2015).

Despite the high prevalence of substance use and SUD among transgender individuals, little is known about substance use treatment (SUTx) utilization among this population or the relationship between transgender-related discrimination and SUTx. One 2013 study of 452 transgender adults in Massachusetts found that 10% of participants reported a substance use treatment history (Keuroghlian et al., 2015), compared to 7.5% of US adults with a SUD and 1% among the total US adult population (Lipari and Van Horn, 2017). Further, in the same study, SUTx and recent substance use were each associated with discrimination in public accommodations venues, intimate partner violence, lower income, older age, and trans feminine identity (Keuroghlian et al., 2015). While these results lay necessary groundwork for understanding substance use and SUTx disparities among transgender adults, several barriers to healthcare persist for transgender individuals, and further study on the prevalence of receipt of substance use treatment by gender identity and its connection to discrimination is warranted.

Although there has been some exploration of factors associated with substance use outcomes among transgender adults, as documented above, substantial gaps in the literature remain. In order to address these gaps, the present study 1) operationalized substance use by quantity and frequency of intentional use to "get high" (i.e., intensity), 2) used a dose response approach to discrimination to assess if higher levels of discrimination exposure are associated with a greater risk for substance use, and 3) controlled for other discrimination and victimization experiences in order to evaluate whether everyday transgender-related discrimination is associated with various substance use outcomes over and above other experiences of victimization. Findings from this study can inform future SUD prevention and treatment interventions for transgender adults.

2. Methods

2.1. Participants and sampling

A non-probability sample of 600 transgender adults completed a survey for Project VOICE NOW! assessing social characteristics, discrimination and victimization experiences, and health status. From March-August in 2019, purposive sampling was used to identify and recruit individuals both online, such as through social media and email listservs, and in-person, including at community events and health clinics. Eligibility criteria included: 1) identifying as transgender/gender variant, 2) being age of 18 years of age or older, 3) residency in Massachusetts or Rhode Island for at least 3 months in the past year, and 4) basic language proficiency in English or Spanish. Informed consent was asked at the start of

the survey. Study activities were approved by the Institutional Review Board at The Fenway Institute and Brown University (Project Number: 1280264–6).

2.2. Measures

2.2.1. Sociodemographics.—Similar to previous research using transgender samples (Keuroghlian et al., 2015; Reisner et al., 2016), "trans masculine" and "trans feminine" were used as umbrella terms to provide more context on individuals' gender identities and sex assigned at birth. *Gender identity* was first categorized into gender spectrums (trans feminine, trans masculine) by cross-tabulating sex (male, female) by gender identity. Within each umbrella term, individuals were further categorized by gender identity as binary (man, woman, trans woman / male-to-female (MTF), trans man/ female-to-male (FTM)) or non-binary (man, woman, trans woman / male-to-female (MTF), trans man/ female-to-male (FTM), non-binary, gender variant, genderfluid, genderqueer, or gender nonconforming, other). For example, a participant assigned male at birth who identified as genderqueer was categorized as non-binary within the trans feminine spectrum.

Age was assessed in years and categorized as 18–29, 30–39, 40–49, and 50 years and above. *Race/ethnicity* was asked as a check-all-that-apply (question and categorized as White (non-Hispanic) vs. People of Color (POC), which included Asian/Pacific Islander (non-Hispanic), Black (non-Hispanic), Hispanic/Latino, another race (non-Hispanic), and multiple races/ethnicities. *Educational attainment* was categorized as high school or less, some college (1–3 years), college graduate (4-year college degree), and graduate school or more (completed). *Employment* was categorized as employed (for wages, self-employed and/or student), out of work, homemaker, and retired. *Income* included total combined individual income before taxes from all sources except for food and nutrition assistance and was grouped into three categories based on the Federal Poverty Guidelines at the time of data collection: <$20,000 (200% or less of FPG), $20,000 to $50,000 (200–400% of FPG), and $50,000 and above (above 400% of FPG) (U.S. Department of Health & Human Services., 2019). *Survey mode* captures whether participants completed the web-based survey online or in-person.

2.2.2. Discrimination.—*Everyday discrimination* was measured by frequency (5-point Likert scale ranging from 0=never to 4=very often) of experiencing various forms of discrimination across one's lifetime using the validated Everyday Discrimination Scale (EDS) (Williams et al., 1997). The EDS is one of the most commonly used instruments for measuring discrimination (Harnois et al., 2019) and includes items such as "you have received poorer service than other people at restaurants or stores" and "you have been called names or insulted" (Williams et al., 1997). The EDS enables respondents to cite the reasons why they believed they were discriminated against. In a previous study with transgender adults (Reisner et al., 2015a), the list of attributions was expanded to include additional items related to gender expression, resulting in a final list of 16 attributes. For the ordinal *transgender-related discrimination* variable, discrimination scores were summed for participants who attributed the reasons for discrimination to one of the 4 following categories: gender identity, gender expression, masculine or feminine appearance, or sex (range=0–44). This sum score was then categorized as [low (range=0–13), low to moderate (range=14–19), moderate to high (range=20–26), and high (range=27–44)], based on a

tertial split. Sensitivity analyses revealed similar results using transgender-related discrimination as a continuous measure. Since transgender-related discrimination was the primary independent variable of interest, we wanted to see if applying ordinal categories transgender-related discrimination reveals how various levels of discrimination may be related to the outcome variables. Additionally, a continuous variable of *discrimination experiences other than being transgender* assessed discrimination pertaining to other attributes (i.e., age, HIV status, race, ethnicity, nationality, religion, sexual orientation, physical disability, education or income level, weight, and other aspects physical appearance).

2.2.3. Other forms of victimization.—Instances of *childhood physical or sexual abuse* (before age 18) were dichotomously (yes/no) assessed in the survey. *Intimate partner violence* was assessed by asking participants if after turning 18: ever been slapped, punched, kicked, beaten up, or otherwise physically hurt by a spouse/former spouse, boyfriend/ girlfriend, or some other intimate partner without your consent.

2.2.4. Substance use outcomes.—For *substance use* in the past 12 months, participants were asked how frequently, on a scale from 0–5 (0=didn't use to 5=used daily) that they used the following drugs to "get high": marijuana, cocaine, crack, club drugs (ecstasy, GHB, ketamine), heroin, methamphetamine, poppers/amyl nitrate, hallucinogens (LSD, mushrooms), downers (Valium, Ativan, Xanax), and painkillers (OxyContin, Vicodin, Percocet). The quantity and frequency of each substance was summed to create a continuous score of substance use (theoretical range=0–50). We elected to use the combined score that accounts for number of substances used and frequency of use because it allows us to evaluate the relationship between discrimination and those with the greatest burden of substance use. This approach allowed us to consider both frequency and number of substances used where individuals with the highest scores are individuals who use many substances frequently. *Substance use disorder (SUD) diagnosis* was assessed by asking participants if they have ever received a SUD diagnosis (yes/no). *Substance use treatment history* was also operationalized as a dichotomous variable (yes/no) for the question, "Have you ever been in treatment for alcohol and/or drug abuse?"

2.3. Data Analysis

Statistical analyses were conducted in Stata/SE version 16.1 (StataCorp LLC, College Station, TX). Pairwise deletion was used in cases of missing data to minimize data loss and to avoid bias parameters. Therefore, samples between models vary. Missingness was reported with each variable in Table 1. Univariate statistics examined variable distribution (mean, standard deviation [SD], frequencies, proportion). Bivariate analyses were performed across all covariates and the three outcome variables: substance use (continuous variable, range=0–46), substance use disorder diagnosis (SUD) (yes/no), and substance use treatment (SUTx) history (yes/no). Bivariate and multivariable simple linear regression analyses were used to determine the association between discrimination, demographics, and other victimization variables and the past 12-month substance use outcome (Model 1) with betas (B) estimates and confidence intervals (CI) at 95% reported. Bivariate and multivariable logistic regression analyses were used to determine the association between discrimination,

demographics, and other victimization variables and SUD (Model 2) and SUTx (Model 3) outcomes with odds ratios (OR), adjusted odds ratios (aOR), and 95% confidence intervals (CI) presented. The multivariable models were adjusted for variables shown to be associated with substance use among transgender individuals in the literature: gender identity, age, race, survey modality, childhood physical or sexual abuse (CPSA), intimate partner violence (IPV), and other reasons not related to being transgender for experiencing discrimination (e.g., HIV status, race, ethnicity, etc.) (Flentje et al., 2014; Keuroghlian et al., 2015; Scheim et al., 2017; Wilton, 2008). Participants recruited in-person had low educational attainment and many were unstably housed; thus survey mode was used as a proxy for socioeconomic status and controlled for in all models. Additionally, our sample included a high number of current students and many who did not report income (n=20). A similar approach of accounting for survey mode has been used in previous work measuring associations of discrimination among transgender individuals (Keuroghlian et al., 2015; Reisner et al., 2015a, 2016). For all analyses, significance was determined at α=0.05.

3. Results

3.1. Sample Characteristics

Descriptive statistics are presented in Table 1. Age ranged from 18–73 years with a mean of 31.3 years (SD = 11.2). Most participants were white (81.4%) which is comparable to population estimates from both states where samples were drawn from (U.S. Census Bureau., 2019). One third of the overall sample had a 4-year college degree (33.3%). Overall, transmasculine participants made up 64% of the sample and 42.2% of all participants identified as non-binary, gender variant, genderfluid, genderqueer, or gender nonconforming. Overall, 69.8% of the sample was employed and almost half of participants (48.6%) had a pre-tax combined individual income of $20,000 or less (including all income sources except for food and nutrition assistance). The vast majority of participants took the survey online (95.3%). Among participants, 60.5% had at least one experience of physical or sexual abuse in childhood while 30.5% of participants reported a history of intimate partner violence.

A large portion of the sample (87.4%) reported experiencing discrimination attributed to being transgender. The mean transgender-related discrimination score was 19.7 (SD = 10.0, range = 0–44). High frequency of discrimination experiences (range = 27–44) occurred among 22% of the sample. Among the sample, there was an average of 2.1 attributed reasons (SD = 1.9) other than being transgender (e.g., race, nationality) for experiencing discrimination (range=0–11). Overall, nearly one third (31.1%) of participants experienced a high frequency of substance use in the past 12 months. Substance use disorders existed among 11.8% of the sample and 11.6% reported having received treatment for substance use.

3.2. Multivariable Analysis

The multivariable analyses are shown in Table 2. Model 1 reveals that compared to low transgender-related discrimination, high transgender-related discrimination scores (B = 1.44; 95% CI = 0.36–2.53; p = .009) were positively associated with substance use holding

constant age, gender identity, race, survey mode, CPSA, IPV and other reasons for discrimination. In this model, being a person of color and IPV history were each positively associated with substance use (all p .03). Age, taking the survey online, and other reasons for discrimination were protective against substance use (p .007). In Model 2, holding the same variables constant as in the first model, compared to low transgender-related discrimination, high transgender-related discrimination scores (aOR = 3.64; 95% CI = 1.46–9.07; p = .006) were associated with a statistically significant higher odds of being diagnosed with a SUD. Experiencing IPV was the only covariate in the model that had a statistically significant and positive relationship with SUD (aOR = 3.05; 95% CI = 1.70–5.48; p < .0001). Transmasculine identity and being a person of color were protective against SUD (all p .05). Similar to the first two models, in Model 3, compared to low transgender-related discrimination, high transgender-related discrimination scores (aOR = 3.93; 95% CI = 1.50–10.21; p = .005) were associated with a statistically significant increase in odds of being receiving SUTx controlling for all covariates. Additionally, in Model 3, moderate to high transgender-related discrimination scores (aOR = 2.49; 95% CI = 1.01–6.20; p = .05) were also associated with receiving SUTx. Age had a statistically significant and positive relationship with SUTx (aOR = 1.05; 95% CI = 1.02–1.07; p < .0001). Similar to the first outcome, taking the survey online was protective against SUTx history (aOR = 0.17; 95% CI = 0.06–0.46; p < .0001). Sensitivity analyses of transgender-related discrimination used as a continuous measure (range:0–44) was conducted using all three outcome variables and produced comparable results.

4. Discussion

This is the first study, to our knowledge, to examine the relationship between transgender-related everyday discrimination and past 12-month substance use, lifetime SUD diagnosis, and lifetime history of substance use treatment among a sample of transgender adults from two states. Nearly half the sample reported moderate to high levels of everyday discrimination (48.2%) in the past 12 months. Moreover, one third of our sample had high past 12-month substance use, with the quantity and frequency of substance use increasing with high levels of discrimination. These findings underscore the need for interventions to address discrimination in the context of substance abuse prevention and treatment for transgender individuals.

Across models, our findings highlight a significant relationship between substance use outcomes and discrimination. Specifically, transgender-related discrimination scores were positively associated with both past 12-month substance use and having a lifetime substance use disorder diagnosis even after adjusting for other factors known to be related to discrimination, such as history of abuse. These findings align with prior research linking discrimination to both substance use (Bradford et al., 2013; Coulter et al., 2018; Nuttbrock et al., 2014) and substance use disorders (Keuroghlian et al., 2015). The significant association between high amounts of transgender-related discrimination and substance use builds off prior research investigating the interplay between stigma and substance use for transgender individuals. While the rationale for using substances was not assessed in the current study, prior research finds that substance use is common strategy to cope with the mental health sequalae of discrimination (Bradford et al., 2013; Coulter et al., 2018; Felner

et al., 2020; Fontanari et al., 2019; Reisner et al., 2014a), thus it is possible that the elevated use of substances among those with high levels of discrimination may represent a mechanism for managing the psychological distress of being mistreated on the basis of one's gender identity. In light of the multiple forms of violence and discrimination experienced by transgender individuals throughout the life course (Stotzer, 2009; White Hughto et al., 2015), it is imperative that clinical interventions with transgender individuals consider the stressors that many transgender people experience and support affected populations in developing health promoting means of coping.

We also found discrimination was significantly associated with higher odds of having received substance use treatment. Prior research on health care stigma among transgender individuals show that anticipated discrimination can serve as a barrier to receiving further treatment among transgender adults (Reisner et al., 2015b). For transgender individuals who do seek health services, discriminatory experiences in healthcare settings are associated with substance use as a coping mechanism for enacted stigma, with the potential to further exacerbate substance use issues (Reisner et al., 2015b). In the context of substance use treatment, prior research shows transgender individuals leave substance use treatment prematurely either out of fear of stigma or actual experiences of stigma (Lyons et al., 2015). Unfortunately, only a small number of treatment programs offer services specific for sexual or gender minorities (Cochran et al., 2007) despite transgender individuals entering substance use treatment having more behavioral health needs (Flentje et al., 2014). In this study, the connection between transgender-related discrimination and substance use treatment contributes to the ample evidence that treatment programs should be tailored to be affirming of patients' gender identities and capable of addressing the psychological and behavioral responses to discrimination that may both generate and exacerbate substance use and abuse.

Our results also demonstrate racial disparities in both substance use and substance use diagnosis, strongly signaling that further study on the disproportionate discrimination experiences among racial and ethnic minorities is needed. Intersectional disadvantages create a myriad of challenges for transgender people of color that are correlated with several adverse health outcomes (Connolly and Gilchrist, 2020). Future work should consider including other forms of discrimination to more rigorously examine the interplay of discrimination based on various attributes (race, disability, etc.).

Our findings carry broader policy and clinical implications for the imperative need to address discrimination in the context of public health and to prioritize effective harm-reduction initiatives for transgender individuals. First, our findings underscore the pressing need for nondiscrimination laws and policies to specifically protect transgender individuals. In tandem with these efforts, providers should be made aware of the role of discrimination in substance use outcomes, and mental health providers should be trained to aid transgender individuals in healthy and resilient coping. Additionally, targeted interventions aimed at helping transgender individuals cope and respond to discrimination are needed along with evaluations for effectiveness (Hughto et al., 2017). For example, the Transgender Resources and Neighborhood Space (TRANS) Project consists of transgender peer-led group workshops centered around harm reduction and building coping skills (Nemoto et al., 2005).

Through a curriculum that includes substance use assessment, community referrals, and teaching of positive self-expression skills, the TRANS Project can serve as an effective intervention in reducing substance use and connecting individuals to treatment (Nemoto et al., 2005). Additionally, individual-level interventions such as transgender Empowerment and Motivational Interviewing (TEAM-I), designed for transgender women of color, showed that motivational enhancement in particular was effective in reducing illicit and non-illicit substance use from baseline to 6-months (Nemoto et al., 2013). Considering anticipated and enacted stigma experienced by transgender individuals in health contexts, health providers should collaborate with community members, advocates and organizations in the design and implementation of culturally tailored substance use interventions. Community input is needed to not only inform intervention content but also to identify optimal mechanisms to ensure that these interventions can be accessed by those in greatest need for such services.

4.1. Limitations

This is the first known study to investigate the relationship between transgender-related everyday discrimination and multiple outcomes related to substance use behaviors and engagement with treatment using a sample from two states. Nonetheless, there are notable limitations within this study. First, a basic assumption throughout this analysis is that substance use is linked to discrimination based upon previous literature (Bradford et al., 2013; Coulter et al., 2018). However, participants were not directly asked about using substances to cope as done in other studies examining the relationship between stigma and substance use (Reisner et al., 2015b). Second, while illicit drug quantity and frequency over the last 12 months was the first outcome assessed, participants were asked about lifetime experiences of transgender-related everyday discrimination, lifetime SUD diagnosis and lifetime substance use treatment. It is not clear where temporal relationships exist between these variables. Although participants were asked about events from their past, this study uses a cross-sectional design and does not assess outcomes longitudinally or derive causal relationships. Third, the purposeful sample included participants from two states of the same region which may not generalize to other parts of the United States. The majority of the sample was composed of white, highly educated younger adults. It is imperative that future studies work to ensure that more representative samples of race and ethnicity are included, such as through over-sampling racial minorities when using nonprobability methods.

5. Conclusion

In this study, we found that high transgender-related discrimination is positively and significantly associated with substance use, receiving a substance use disorder diagnosis, and having accessed substance use treatment. This study builds on previous research on substance use and discrimination among transgender adults (Bradford et al., 2013; Coulter et al., 2018; Keuroghlian et al., 2015), and is the first study that we are aware of to assess the impact of everyday discrimination on all three substance use outcomes using sample of transgender adults. More in-depth research using a variety of methods is needed to understand specific factors driving these relationships and determine effective interventions for substance use treatment. For example, longitudinal cohort studies could be used to better understand a variety of exposures among transgender adults that may be predictive of

substance use, in addition to the temporality between everyday discrimination experiences and substance use in order to more effectively intervene. Targeted interventions both inside and outside clinical settings should be based on evidence specific to transgender communities.

Acknowledgments

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Highlights

- High levels of transgender-related discrimination are associated with substance use

- Experiencing transgender-related discrimination yields higher odds of SUD

- Substance use treatment is associated with transgender-related discrimination

Table 1.

Characteristics of a sample of transgender adults in Massachusetts and Rhode Island, ages 18–73 years (N = 600)

SOCIO-DEMOGRAPHICS	n	%	M	SD
Age (Range: 18–73 Years)			31.3	11.2
Age (n = 600)				
18–29	333	55.5		
30–39	172	28.7		
40–49	39	6.5		
>50	56	9.3		
Race/Ethnicity (n = 598)				
White (non-Hispanic)	487	81.4		
Person of Color	111	18.6		
Asian/Pacific Islander (non-Hispanic)	17	2.8		
Black (non-Hispanic)	19	3.2		
Hispanic/Latino	20	3.3		
Another race (non-Hispanic)	9	1.5		
Multiple race/ethnicities	46	7.7		
Gender Identity (n = 600)				
Trans feminine spectrum	202	33.7		
Trans woman	149	73.8		
Non-binary	53	26.2		
Trans masculine spectrum	389	64.8		
Trans man	189	48.6		
Non-binary	200	51.4		
Prefer not to answer	9	1.5		
Educational Attainment (n = 598)				
High School or Less	85	14.2		
Some college (1–3 years)	183	30.6		
College graduate (4 year college degree)	199	33.3		
Graduate school	131	21.9		
Employment (n = 600)				
Employed (wages, self-employed and/or student)	419	69.8		
Out of Work	109	18.2		
Homemaker	62	10.3		
Retired	6	1.0		
Prefer not to answer	4	0.7		
Income (n = 580)				
<20 k	282	48.6		
20 k to <50 k	155	26.7		

SOCIO-DEMOGRAPHICS	n	%	*M*	*SD*
50 k +	143	24.7		
Survey Mode (n = 600)				
In-person	28	4.7		
Online	572	95.3		
VICTIMIZATION				
Childhood Physical or Sexual Abuse (n = 562)				
No	222	39.5		
Yes	340	60.5		
Adult Physical or Sexual Abuse - Lifetime (n = 547)				
No	380	69.5		
Yes	167	30.5		
DISCRIMINATION - LIFETIME	n	%	*M*	*SD*
Attributed Discrimination to being Transgender (n = 573) - By group based on quartiles				
Low (0–13)	160	27.9		
Low to moderate (14–19)	137	23.9		
Moderate to high (20–26)	150	26.2		
High (27–44)	126	22.0		
Transgender-Related Discrimination Score (n = 573)				
Range: 0–44			19.7	10.0
Number of everyday discrimination experiences other than being transgender (n = 573)				
Range 0–11			2.1	1.9
SUBSTANCE USE				
Substance Use - Past 12 months (n = 575)				
Range: 0–46			2.3	4
Substance Use Disorder Diagnosis - Lifetime (n = 600)				
No	88.2	529		
Yes	11.8	71		
Treated for Substance Use - Lifetime (n = 571)				
No	88.4	505		
Yes	11.6	66		

Note. Discrimination attributions are not mutually exclusive. Other reasons for discrimination include one or more of the following: age, HIV status, race, ethnicity, nationality, religion, sexual orientation, physical disability, education or income level, weight, and other aspect of your physical appearance. Substance use is a continuous variable based on past 12-month frequency of use to get high (didn't use, once a month or less, several times per month, about once a week, several times per week, daily) and quantity of 10 substances/classes of substances (marijuana, cocaine, crack, club drugs, heroin, methamphetamine, amyl nitrate/poppers, hallucinogens, benzodiazepines/downers, and pain medications).

M=Mean; SD=standard deviation

Table 2.

Multivariable Models of Transgender-related Discrimination and Substance Use Outcomes

	OUTCOME 1: SUBSTANCE USE						OUTCOME 2: SUBSTANCE USE DISORDER						OUTCOME 3: SUBSTANC			
	Bivariate			Model 1			Bivariate			Model 2			Bivariate			
	B	95% CI	P	aB	95% CI	P	OR	95% CI	P	aOR	95% CI	P	OR	95% CI	P	aO
TGR																
Discrimination																
Low	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.0
Low to moderate	0.26	−0.67–1.18	0.585	0.33	−0.60–1.26	0.49	1.17	0.73–3.98	0.22	1.50	0.60–3.73	0.38	1.43	0.60–3.41	0.43	1.5
Moderate to high	0.66	−0.24–1.57	0.152	0.40	−0.57–1.36	0.42	2.44	1.11–5.37	**0.02**	2.12	0.87–5.14	0.09	2.15	0.97–4.80	0.06	2.4
High	2.14	1.19–3.08	**<0.0001**	1.44	0.36–2.53	**0.009**	3.71	1.71–8.06	**0.001**	3.64	1.46–9.07	**0.006**	3.41	1.56–7.44	**0.002**	3.9
DEMOGRAPHICS																
Age (in years)	−0.03	−0.06–(−0.01)	**0.042**	−0.04	−0.07–(−0.01)	**0.007**	1.02	1.00–1.04	0.10	1.01	0.99–1.04	0.29	1.04	1.02–1.06	**<0.0001**	1.0
Gender Identity																
Trans feminine	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.0
Trans masculine	−0.70	−1.41–0.01	0.05	−0.44	−1.19–0.32	0.26	0.44	0.26–0.74	**0.002**	0.50	0.28–0.89	**0.02**	0.46	0.27–0.78	**0.004**	0.8
Race																
White	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.0
Person of color	1.29	0.43–2.15	**0.003**	1.00	0.07–1.93	**0.03**	0.37	0.16–0.88	**0.02**	0.38	0.14–0.98	**0.05**	1.13	0.59–2.17	0.70	0.8
Survey Mode																
In-person	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.0
Online	−3.55	−5.10–(−2.00)	**<0.0001**	−3.17	−4.81–(−1.54)	**<0.0001**	0.80	0.27–2.36	0.68	0.88	0.25–3.08	0.85	0.20	0.09–0.45	**<0.0001**	0.1
VICTIMIZATION																
Childhood Abuse																
No	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.0
Yes	1.06	0.37–1.75	**0.003**	0.63	−0.11–1.38	0.09	1.54	0.89–2.65	0.12	0.98	0.52–1.86	0.96	1.77	0.99–3.13	0.05	0.9
IPV - Lifetime																
No	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.00	----	----	1.0
Yes	1.93	1.20–2.67	**<0.0001**	1.58	0.81–2.36	**<0.0001**	3.83	2.26–6.48	**<0.0001**	3.05	1.70–5.48	**<0.0001**	2.27	1.33–3.87	**0.003**	1.4
Other Discrimination	0.04	−0.16–0.24	0.70	−0.41	−0.65–(−0.17)	**0.001**	0.94	0.80–1.10	0.45	0.92	0.77–1.11	0.39	1.04	0.89–1.21	0.63	0.9

B = Beta Coefficient; aB = Adjusted beta coefficient; aOR = Adjusted Odds Ratio; OR = Odds Ratio; TGR = Transgender-related; IPV = Intimate partner violence

Note. All models adjusted for age, gender identity, race, survey modality, and childhood physical and sexual abuse, and intimate partner violence. White connotes non-Hispanic white individuals. Childhood abuse includes physical or sexual abuse. Other reasons for discrimination include one or more of the following: age, HIV status, race, ethnicity, nationality, religion, sexual orientation, physical disability, education or income level, weight, and other aspect of your physical appearance.

Sample sizes: Model 1 = 530; Model 2 = 533; Model 3 = 528