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Opioid Pain Medication Misuse, Concomitant Substance Misuse, and the Unmet Behavioral Health Treatment Needs of Transgender and Gender Diverse Adults

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Contributors

JWH formulated the study concept and design, conducted the data analysis, and led the drafting of the manuscript. LG and AJR conducted literature reviews and wrote drafts of the introduction and discussion, respectively. HLW contributed to the conceptualization of the analysis. JWH, SLR, SRC, and MJM are Investigators on the parent study. All authors contributed to the interpretation of the analysis and editing of the manuscript.

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Conflict of Interest
No conflict declared.

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Abstract

Background: Limited research has explored risk factors for opioid pain medication misuse, concomitant substance misuse, and the unmet behavioral health treatment (BHtx) needs of transgender and gender diverse (TGD) adults.

Methods: In 2019, TGD adults (n=562) in Massachusetts and Rhode Island were purposively recruited and completed a psychosocial and behavioral-health survey (95% online; 5% in-person). Multivariable logistic regression was used to examine factors associated with past 12-month opioid pain medication misuse and unmet BHtx needs.

Results: Overall, 24.4% of participants were trans women; 32.0% trans men; and 43.6% were non-binary. Past-year substance misuse included: marijuana (56.8%), hazardous drinking (37.5%), hallucinogens (9.8%), benzodiazepines (8.2%), and opioid pain medication (8.0%). Among participants with past-year substance misuse and BHtx need (n=326), 81.3% received BHtx and 18.7% had unmet BHtx needs. Being a trans woman, having HIV, reported stigma in healthcare, and number of substances misused were associated with increased odds of past-year opioid pain medication misuse; high social connectedness was associated with decreased odds of opioid pain medication misuse (p -values<0.05). Younger age, reported stigma in healthcare, and misusing opioid pain medications were associated with increased odds of unmet BHtx needs; post-traumatic stress disorder and family support were associated with decreased odds of unmet BHtx needs (p -values<0.05).

Conclusions: Addressing disparities in opioid pain medication misuse among TGD people requires systematic improvements in healthcare access, including efforts to create TGD-inclusive BHtx environments with providers who are equipped to recognize and treat the social and structural drivers of TGD health inequities, including opioid pain medication misuse.

Keywords

opioid; pain medication; substance use; substance misuse; behavioral health; transgender

1. Introduction

Transgender and gender diverse (TGD) people, whose gender identity differs from their assigned birth sex, are at-risk for substance use, misuse, and substance use disorder (Benotsch et al., 2013; Coulter et al., 2015; James et al., 2016; Jun et al., 2019; Keuroghlian et al., 2015; Reisner, S.L. et al., 2016; Reisner et al., 2014b; Rowe et al., 2015) Research

suggests that substance use/misuse is driven in part by some TGD people's reliance on substances to cope with the psychological toll of discrimination (Hughto, 2021; Reisner, Sari L et al., 2015; Reisner, S.L. et al., 2015; White Hughto et al., 2017) While extensive research has captured the burden of broad substance use/misuse among TGD people (Benotsch et al., 2013; Coulter et al., 2015; James et al., 2016; Jun et al., 2019; Keuroghlian et al., 2015; Reisner, S.L. et al., 2016; Rowe et al., 2015), little is known about TGD people's misuse of opioid pain medications alone and together with other substances. Understanding the prevalence of opioid medication misuse and related risk factors is important given the morbidity and mortality associated with the current US opioid crisis (CDC, 2020; Weiss et al., 2017) and burgeoning research demonstrating that TGD individuals are at elevated risk for opioid use disorder relative to their cisgender counterparts (Hughto, 2021).

Although prior research has explored opioid pain medication misuse among people who identify as lesbian, gay, bisexual, and queer (Capistrant and Nakash, 2019; Duncan et al., 2019; Schuler and Collins, 2020), existing studies offer little insight into the prevalence of opioid pain medication misuse among TGD individuals. Several studies use broadly defined outcome measures, such as "other drug use" or "illicit substance use," leaving the prevalence of opioid pain medication misuse largely unknown (Brennan et al., 2012; Hotton et al., 2013; Operario et al., 2014). For example, the 2015 US Transgender Survey found that 29% of respondents had used marijuana, prescription medication for non-medical reasons, and/or illicit drugs in the previous 30 days compared with 10% of the general US population (James et al., 2016); yet the specific prevalence of opioid medication misuse was not reported. Another study by Benotsch et al. (2013) found a 26.5% lifetime risk of non-medical prescription drug use among TGD adults with the most commonly used class of medications being analgesics, as compared with a nearly 6% lifetime risk of non-medical prescription drug use in the general US adult population (SAMSHA, 2019). To our knowledge, only one study explicitly explored the burden of opioid pain medication misuse in TGD people (Restar et al., 2020a). In a sample of young trans women, ages 16 and 29 years of age, from two US cities, Restar et al. (2020) found that the lifetime prevalence of opioid pain medication misuse was 11.8%, which was comparable to the US general population in the same year (12.6%). While these studies are important contributions to the literature, lack of information about the misuse of opioid pain medications among TGD people from across the gender spectrum limits our understanding of the actual burden of opioid pain medication misuse among this population.

Also understudied are the factors that may impact risk for opioid pain medication misuse. Across studies with TGD people, reports of stigma, discrimination, and other forms of victimization have been found to be associated with substance use generally (Reisner, S.L. et al., 2015; Wolfe et al., 2020), and prescription medication misuse specifically (Kidd et al., 2020). Indeed, victimization and associated minority stress can result in depression and anxiety, and research finds that many TGD individuals turn to substance use to cope (Felner et al., 2020; Hendricks and Testa, 2012; Lefevor et al., 2019; Reisner, S.L. et al., 2015; Wang et al., 2018; White Hughto et al., 2015). However, the extent to which TGD-related victimization and poor mental health are associated with opioid pain medication misuse warrants further investigation. The only known study of opioid pain medication misuse

found that, among young TGD women, smoking cigarettes was associated with opioid pain medication misuse (Restar et al., 2020a). However, other demographics factors such as comorbid alcohol and substance use disorder, poor mental health, healthcare avoidance, and reported mistreatment in healthcare, which have been shown to be related to general prescription medication misuse among TGD populations (Benotsch et al., 2013; Kidd et al., 2020), were not found to be significantly related to opioid medication misuse among the sample. While social support has been shown to buffer against the effects of TGD-related victimization, including the misuse of substances to cope (White Hughto and Reisner, 2016; Ybarra et al., 2015), no study, to our knowledge, has simultaneously explored the relationship between reported victimization and social support in relation to opioid pain medication misuse for TGD people. Given the dearth of research on risk and protective factors for opioid pain medication misuse among samples of TGD people from across the gender spectrum, further research is needed.

Despite the high prevalence of substance use/misuse among TGD individuals, little is known about the behavioral healthcare treatment (BHTx) utilization (e.g., mental health and substance use treatment) of TGD people who misuse opioid pain medications and other substances. Across studies, the prevalence of lifetime substance use treatment history has ranged from 10–11.2% among US TGD adults (Keuroghlian et al., 2015; Wolfe et al., 2020). When exploring factors associated with substance use treatment receipt, one study of TGD adults in Massachusetts found that older age, being a trans woman, low income, intimate partner violence, and discrimination were associated with increased odds of having received substance use treatment (Keuroghlian et al., 2015). While the aforementioned study offers some insights into which TGD groups have been able to access substance use treatment, it fails to describe the unmet treatment needs of TGD people who require such services but have not been able to receive them. Moreover, prior studies have focused on the lifetime receipt of substance use treatment specifically without considering the full range (e.g., substance use treatment and mental health counseling) of behavioral healthcare treatment (BHTx) that most people with substance use disorders require to achieve their recovery goals (SAMSHA, 2020). Given the high prevalence of co-occurring victimization, substance misuse, and opioid use disorder that TGD people experience (Benotsch et al., 2013; Coulter et al., 2015; Hughto, 2021; James et al., 2016; Jun et al., 2019; Keuroghlian et al., 2015; Reisner, S.L. et al., 2016; Reisner et al., 2014b; Rowe et al., 2015; White Hughto et al., 2015), it is important to identify the social and behavioral factors that place some TGD subgroups at greater risk for having unmet BHTx needs so that targeted interventions can be developed to support those with the greatest treatment needs.

2. Methods

2.1. Study Procedures

Between March and August 2019, Brown University and The Fenway Institute collaborated to conduct a stress and health needs assessment of 600 TGD adults in Massachusetts (MA) and Rhode Island (RI). The study utilized a participatory population-perspective to understand how structural and interpersonal stressors influence the health of TGD communities (Leung et al., 2004; Reisner, S. et al., 2016). Participants were recruited via

community-specific online and in-person spaces. The majority (95%) were sampled online (via electronic listservs, community-based websites, social networking sites); 5% were sampled in-person (onsite at TGD community events, community organizations, and healthcare clinics). Eligible participants were ages 18 years or older, self-identified as TGD, non-binary, or otherwise gender-diverse, resided in Rhode Island or Massachusetts for at least 3 months in the last year, and had the ability to read/write in either English or Spanish.

Participants completed a one-time survey assessing sociodemographics, victimization, social support, substance use, and behavioral health treatment receipt/need. Upon reaching the end of the survey, participants could opt to be entered into a community raffle for one of 54 gift cards ranging in value from \$10 to \$250. Electronic written informed consent was obtained for all enrolled participants. All study activities were approved by the Institutional Review Board at Brown University and the Fenway Institute.

2.2. Measures

2.2.1. Sociodemographics.—Age was assessed in years and categorized as young adult (yes = age 18–29 vs. no = 30 and older). Race/ethnicity was asked as a check-all-that-apply question and categorized as white (non-Hispanic) vs. racial/ethnic minority, which included Asian/Pacific Islander (non-Hispanic), Black (non-Hispanic), Hispanic/Latino, another race (non-Hispanic), and multiple races/ethnicities. Gender identity was assessed using a two-step method with two items: (1) assigned sex at birth (female, male) and (2) current gender identity (e.g., man, trans man, woman, trans woman, genderqueer, non-binary) (Reisner et al., 2014a). The two items were cross-tabulated to categorize participants as trans women, trans men, or non-binary (e.g., genderqueer, gender non-conforming). HIV status was assessed; participant responses were coded as living with HIV (yes vs. no). Health insurance was assessed and coded as public (e.g., Medicare, Medicaid, Veterans Affairs), private (e.g., school or employer-provided insurance), and no insurance.

2.2.2. Victimization.—Participants were asked about victimization experiences throughout the life course via measures previously utilized in TGD samples (James et al., 2016; Reisner, Sari L et al., 2016b; White Hughto et al., 2017). Participants were asked whether they were physically or sexually abused as children (before age 18; yes/no) (James et al., 2016). Physical and sexual abuse (partner and non-partner) in adulthood (age 18 or older) were also assessed (yes/no) (Feldhaus et al., 1997; Reisner et al., 2013).

Everyday discrimination was assessed using the 11-item Everyday Discrimination Scale (EDS) (Williams et al., 1997) which has been previously validated among TGD samples (Hughto et al., 2018; White Hughto and Reisner, 2016). Participants were asked how often (on a Likert scale from 0=never to 4=very often) they experienced various forms of discrimination throughout their lifetime. The 11 items were summed to create a continuous measure of everyday discrimination (range: 0–44).

Participants were also asked the extent to which they agreed or disagreed with several statements about experiences of perceived stigma and mistreatment in healthcare settings in the past 3 years (on a Likert scale from 1=strongly disagree to 5=strongly agree). Participants who agreed or strongly agreed with having been judged by healthcare providers,

staff, or people in the waiting room of a healthcare center, were coded as “yes” to having reported stigma in a healthcare setting, and all others were coded as “no.” Participants who agreed or strongly agreed with having been harassed or attacked in a healthcare setting were coded as “yes,” all others were coded as “no.”

2.2.3. Mental Health and Self-Harm.—Internalized transphobia was assessed by asking participants the extent to which they agreed or disagreed (on a Likert scale from 1=strongly disagree to 5=strongly agree) with the following statement: “I wish I were not TGD.” (Reisner, S. L. et al., 2015) Disagreement was coded as “absent,” “neutral” and “neither fully absent nor fully present,” and agreement was coded as the “presence of internalized transphobia.” Clinically significant depressive and anxiety symptoms were assessed in the past 7 days using the 18-item Brief Symptom Inventory (BSI) (Derogatis, 2001). The 6 depression items and 6 anxiety items were each summed and standardized using t-scores and then dichotomized based on a standard cutoff score indicative of clinically significant symptoms. Post-traumatic stress disorder (PTSD) symptoms were assessed using a 4-item scale designed for primary care settings (Ouimette et al., 2008; Prins et al., 2003; Prins et al., 2004). Participants responded to each item using binary (yes/no) responses. Items were summed and dichotomized based on a score of 3 or more to indicate clinically significant PTSD symptomatology. Lifetime non-suicidal self-injury was assessed by asking participants whether they had ever engaged in intentional self-injurious behavior (e.g., burning, cutting, severe scratching, hitting, etc.) without suicidal or lethal intent (yes/no). (CDC, 2013) Lifetime suicide attempt was assessed by asking participants whether have ever attempted suicide (yes/no) (Grant et al., 2011).

2.2.4. Social Support.—Social connectedness was assessed by asking participants to report how many close friends they have with 11 response options ranging from 0 to 10 or more. Next, responses were categorized as “low” (0–2 friends) and “high” (3 or more friends) based on prior research (Degges-White, 2019). Participants were also asked to indicate how supportive their family is of their gender identity/expression. Responses were coded in tripartite categories as “not supportive,” “somewhat supportive,” and “supportive.”

2.2.5. Opioid Pain Medication Misuse, Past 12 Months (Outcome 1).—Participants were asked if they had used *opioid pain medications* (OxyContin, Vicodin, Percocet) to “get high” in the last 12 months (yes/no) (Reisner, S. L. et al., 2015).

2.2.6. Other Substance Misuse, Past 12 Months.—The misuse of other substances in the past year was also assessed. Hazardous drinking was screened using AUDIT-C (Bush et al., 1998), which has 3 questions, which when combined provides a score from 0–12. Response options were dichotomized as hazardous drinking (yes/no) based on a cutoff of 4 for people assigned a male sex at birth and 2 for people assigned a female sex at birth. Drug use was queried by asking participants whether they had used (yes/no) the following 8 types of drugs to “get high”: marijuana, cocaine, crack, club drugs (ecstasy, GHB, ketamine), heroin, methamphetamine, hallucinogens (LSD, mushrooms), and benzodiazepines (Valium, Ativan, Xanax) (Reisner, S. L. et al., 2015).

All 8 drug types, hazardous drinking, and opioid pain medication misuse were summed to create a continuous score of substance misuse (range: 0–10). To explore the independent relationship of the misuse of substances other than opioid pain medication, a separate continuous measure of other substances used (not including opioid pain medications) was also created (range: 0–9).

2.2.7. Unmet Behavioral Healthcare Treatment Needs (Outcome 2).—

Participants were asked whether they had received behavioral healthcare for their mental/emotional health and/or substance use problems in the past year. Response options include “yes, received,” “no, but needed,” and “no, not needed.” Individuals who did not report a need for treatment were not included in the outcome 2 analysis (see Data Analysis section).

2.3. Data Analysis

The sample was restricted to participants with past 12-month substance use data, resulting in a final analytical sample of $N=562$. No significant differences in age, gender, or race were identified between the full sample and the analytic sample. Univariate descriptive statistics were used to summarize the overall distribution of variables including the mean, standard deviation (*SD*), frequency, and proportion for the overall sample. The sample was then restricted to individuals who reported any substance misuse in the past 12 months ($n=284$) and χ^2 and Fisher exact tests examined global differences in the prevalence of each substance by opioid pain medication use.

Next, using the full analytic sample ($n=562$), bivariate analyses were used to examine factors associated with opioid pain medication misuse in the past 12 months (Outcome 1); variables associated with the outcome at $p<0.25$ were included in the subsequent models. Age and race-adjusted, multivariable logistic regression analyses were then used to examine factors associated with the outcome. Variables were entered into blocks beginning with demographics (Block 1), followed by demographics, victimization, mental health, self-harm, social support; and number of other substances (Block 2).

Next, the sample was restricted ($n=326$) to individuals who had misused substances in the past 12 months and who reported receiving or needing to receive BHtx during the same time period (Outcome 2). Bivariate analyses were used to examine the association between each independent variable and the outcome; variables that were associated with the outcome at $p<0.25$ were included in the subsequent models. Age and race-adjusted, multivariable logistic regression analyses were then used to examine the association of sociodemographics, victimization, mental health and self-harm, social support, and unmet BHtx needs. Variables were entered into blocks beginning with demographics (Block 1), followed by Block 1 + victimization, mental health, self-harm, social support; number of other substances, and opioid pain medication misuse in the past 12 months (Block 2).

All statistical analyses were conducted in SAS 9.4 (SAS Institute Inc., Cary, NC, 2015). Statistical significance for the final models was determined at $p<0.05$.

3. Results

3.1. Sample characteristics

As shown in Table 1, participants' mean age was 31.4 years ($SD=11.2$) and 55% sample were under the age of 30. The majority of the sample were White non-Hispanic (81.9%), 43.6% identified as non-binary, 66.9% had private insurance, and 2.1% reported having HIV.

Overall, participants reported experiencing various forms of victimization throughout the life course. More than half the sample reported experiencing physical or sexual abuse as a child (61.4%) and as an adult (58.3%). The mean EDS score was 18.3 ($SD=11.2$), 27% reported experiencing stigma in a healthcare setting within the past 3 years and 10.7% reported being harassed or attacked in a healthcare setting during the same time period.

Regarding mental health, 15.8% of the sample were depressed, 13.1% had anxiety, and 36.9% had PTSD. More than half of the sample (62.3%) had engaged in non-suicidal self-injury and 36% had attempted suicide in their lifetime.

More than three-quarters of the sample (74.6%) reported high social connectedness and 88.8% reporting have a family that was supportive (63.2% somewhat supportive; 24.8% supportive) of their gender identity/expression.

Participants reported misusing an average of 1.3 ($SD=1.5$) substances in the past 12 months, with the most commonly misused substance being marijuana (56.8%) followed by hazardous drinking (37.5%), hallucinogens (9.8%), benzodiazepines (8.2%) and opioid pain medications (8.0%).

In terms of participants who misused substances in the past year and needed BHtx, 81.3% indicated that they received BHtx in the past 12 months and 18.7% reported unmet BHtx needs.

3.2. Modeling Opioid Pain Medication Misuse in Past 12 Months (Outcome 1)

Table 2 presents the global differences in past-year substance misuse by opioid pain medication misuse. In separate bivariate analyses, participants who reported misusing hallucinogens, club drugs, methamphetamine, cocaine, crack, benzodiazepines, and heroin each had a higher prevalence of opioid pain medication misuse relative to those who did not report misusing each of these substances (all $p<.0001$). Statistically significant differences were not observed between hazardous drinking or marijuana misuse and opioid pain medication misuse.

Table 3 presents the adjusted, multivariable logistic regression analyses examining factors associated with past 12-month opioid pain medication misuse among the full sample. In the final multivariable model (Block 2), being a trans woman ($aOR= 3.22$; 95% $CI=1.05-9.93$; $p=0.04$), having HIV ($aOR= 9.01$; 95% $CI=1.19-68.18$; $p=0.03$), reporting stigma in a healthcare setting ($aOR=5.51$; 95% $CI=1.84-16.54$; $p=0.002$), and number of other substances misused ($aOR=2.74$; 95% $CI=1.94-3.89$; $p<.0001$) were significantly associated with increased odds of misusing opioid pain medications in the past 12 months, whereas

high social connectedness was protective against opioid pain medication misuse (aOR=0.33; 95% CI=0.14–0.80; $p=0.01$).

3.3. Modeling Past Year Unmet Behavioral Healthcare Treatment Needs (Outcome 2)

Table 4 displays results of the adjusted, multivariable logistic regression analyses examining factors associated with the past 12-month receipt behavioral healthcare. In the final model multivariable model (Block 2), being a young adult (aOR= 2.79; 95% CI=1.30–5.99; $p=0.01$), reporting stigma in a healthcare setting (aOR=2.45; 95% CI=1.14–5.26; $p=0.02$), and misusing opioid pain medications (aOR=3.14; 95% CI=1.03–9.63; $p=0.04$) were each significantly associated with increased odds of having unmet behavioral healthcare needs in the past 12 months. In the same final model, PTSD (aOR=0.41; 95% CI=1.26–7.37; $p=0.01$) and some family support (aOR=0.31; 95% CI=0.12–0.80; $p=0.01$) were each associated with decreased odds of having unmet BHtx needs.

4. Discussion

This is the first study to our knowledge to examine risk and protective factors for opioid pain medication misuse and the unmet BHtx needs of a gender-diverse sample of TGD people. Building on prior work among young TGD women (Restar et al., 2020a), the current study finds that the prevalence of past-year opioid pain medication misuse was 8.0%, which is more than twice that of the US general population in 2018 (i.e., 3.7%) (SAMSHA, 2019). Additionally, this study found that being a trans woman, living with HIV, social connectedness, and concurrent substance misuse were associated with past-year opioid pain medication misuse, whereas younger age, reported stigma in healthcare, poor mental health, family support, and opioid pain medication misuse were associated with unmet BHtx needs in the past year. These findings underscore the need for interventions to prevent opioid pain medication misuse among TGD individuals as well as efforts to increase access to BHtx for TGD individuals who use/misuse substances, including opioid pain medications.

In line with previous research on the pernicious sequelae of TGD-related victimization (Hendricks and Testa, 2012; Lefevor et al., 2019; White Hughto et al., 2015), our study found that TGD individuals who experienced stigma in healthcare settings are more likely to misuse opioid pain medications. Moreover, as the misuse of other substances increased, so too did the odds of opioid pain medication misuse, suggesting that opioid pain medications are frequently one of many substances that some TGD people may misuse. Our findings align with prior research showing that TGD individuals may misuse substances including opioids to cope with stigma and discrimination, particularly following experiences of mistreatment from a healthcare provider or other staff in clinical settings (Felner et al., 2020; Reisner, S.L. et al., 2015; Wang et al., 2018; White Hughto et al., 2017). Notably, however, the present study found that high social connectedness was protective against opioid pain medication misuse. In this way, our findings align with the gender minority stress theory by demonstrating the role of resilience resources (e.g., social support, community connectedness) in buffering against the negative impact of victimization on the health of TGD people (Hendricks and Testa, 2012; White Hughto et al., 2015). These findings suggest that fostering social connectedness may provide greater capacity for coping and resilience

and underscore the importance of building strong community ties as a means of mitigating the substance use related sequelae of TGD-related victimization. Future clinical interventions aimed at decreasing opioid misuse among TGD populations would benefit from integrating trauma-informed approaches that leverage social support as a means of reducing minority stress and its harmful effects on this population.

We also found that opioid pain medication misuse was more likely to be reported among specific subgroups including trans women and those with HIV. The higher prevalence of opioid pain medication misuse among trans women in this sample extends findings from a prior national study showing an elevated prevalence of opioid use disorder among trans women relative to other TGD groups (White Hughto et al., 2015). This difference could be attributed to the possibility that trans women experience greater stressors and/or more readily cope with stress through the use of pain medications relative to other groups. Another possible driver of gender differences in opioid pain medication misuse may relate to disparities in HIV infection across gendered sub-groups. Indeed, a recent meta-analysis finds that 14% of trans women and 3.4% of trans men in the US are living with HIV (Becasen et al., 2019). Prior research routinely documents substance misuse as risk factor for HIV among TGD people (Garofalo et al., 2006; Hotton et al., 2013; Reback and Fletcher, 2014; Reisner, S. L. et al., 2016), although an emerging body of research highlights that some people with HIV use non-prescribed opioid pain medications to mitigate symptoms of chronic pain associated with HIV infection (Uebelacker et al., 2015). Thus, it is possible that opioid pain medication misuse may be a consequence of the unmet pain management needs of TGD people with HIV. The misuse of opioid pain medication among TGD people with HIV may also represent a coping strategy to deal with the stress of HIV-related stigma as well as the physical and mental toll of managing a lifelong chronic illness (Earnshaw et al., 2020; Pence et al., 2008). Future efforts to reduce opioid pain medication misuse should aim to provide gender-inclusive care that addresses the unique stressors faced by all TGD subgroups, particularly those with HIV.

Our study also represents one of the first quantitative studies to identify the unmet BHtx needs of TGD people who misuse substances including opioid pain medications. Specifically, we found that those who misused opioid pain medications were at elevated odds of having unmet BHtx needs, even after controlling for the number of other substances used. These findings suggest that TGD people who misuse opioid pain medications may face unique barriers to accessing behavioral healthcare despite their recognized need for such care. Notably, younger age and prior experiencing stigma in healthcare settings were also significantly associated with having unmet BHtx needs. Numerous studies have documented the role that stigma in healthcare plays in treatment access including the avoidance of substance use treatment services for fear of future discrimination and the early departure from treatment programs due to stigma (James et al., 2016; Lyons et al., 2015; White Hughto et al., 2017). Moreover, younger individuals may be more likely than older TGD adults to avoid needed care as a means to prevent future mistreatment. It may also be that younger people are still covered by their parent's health insurance and do not want their parents to know about their substance misuse or the ways in which their substance misuse may be tied to their TGD-experience including TGD-related victimization. In line with these theories, our study found that family support was protective against having unmet BHtx

needs among people who misuse substances; thus, it possible that families who accept their TGD loved one also provide the intrinsic financial or emotional support needed to access BHtx when needed. Lastly, the present study found that PTSD was associated with the lower odds of having unmet behavioral healthcare needs suggesting that those who are experiencing some of the most severe psychological effects of trauma are able to receive necessary care. Given that opioid pain medication misuse can lead to opioid use disorder, the development of physical and mental health comorbidities, and death (NIH, 2020), these findings underscore the need to ensure that all TGD people with BHtx needs are able to receive care, particularly those who misuse opioid pain medications.

The US opioid crisis affects all demographic groups in the US, however, as shown here, some groups, such as TGD people, are disproportionately affected. A national strategy was recently launched to expand access to medications for opioid use disorder (e.g., methadone and buprenorphine) and evidence-based behavioral healthcare; while laudable (HHS, 2020), the strategy fails to recognize the gaps in treatment access and delivery that contribute to disparities in treatment outcomes for marginalized groups such as TGD people. In line with the current literature on gender-affirming model of care (Chen et al., 2016; King and Gamarel, 2020; Reisner, Sari L et al., 2016a), engaging TGD persons who misuse substances in behavioral health programs that utilize a gender-based health equity framework to address root causes of gendered health inequities may be particularly effective (Restar et al., 2020b). However, research suggests that most BHtx programs are ill-equipped to meet the treatment needs of TGD people who misuse substances (Glynn and van den Berg, 2017; Lyons et al., 2015). Necessary gender-transformative changes in BHtx settings include implementing cultural competency and gender inclusivity trainings for all staff as well as clinical trainings for providers to increase their recognition of TGD-specific drivers of substance misuse (e.g., stigma) and develop the skills to attend to the gender affirmation needs and complex trauma histories that many TGD people who misuse opioid pain medications and other substances experience. Future mixed-methods research would benefit from identifying the current capacity of BHtx providers to meet the needs of TGD people and identify mechanisms through which to implement gender transformative changes aimed at eliminating inequities in substance misuse and treatment access for TGD people who misuse opioid pain medications and other substances.

4.1. Limitations

This study has several limitations. As a cross-sectional study, causality cannot be inferred. The racial/ethnic distribution of this convenience sample (81% White) was similar to the racial/ethnic distribution of residents of Massachusetts (81% White) and Rhode Island (84% White) (U.S. Census, 2020a, b); however, it is possible that our findings might not be generalizable to samples largely comprised of racial/ethnic minorities or recruited in other locations. In addition, this study did not assess, and therefore could not control for, psychological or emotional abuse, which has previously been linked to poor mental health among TGD individuals (Peitzmeier et al., 2019). Moreover, we used a measure of substance misuse used in prior research. Notably, the measure only assessed use for the purposes of getting high and only a few examples of opioid pain medications were provided as examples; this may have led to the underreporting of opioid pain medication misuse as

well as other forms of use (e.g., off label use for other indications). Future research using more expansive measures of substance use, including clinically-diagnostic indicators of substance use disorders would increase the rigor of assessing substance use and misuse among transgender populations. Another limitation is that we did not assess BHtx need as a whole and did not assess unmet substance use treatment needs separately from mental healthcare needs. While mental health and substance use treatment are inherently intertwined, future mixed methods research should explore specific facilitators and barriers to substance abuse treatment for TGD individuals struggling with the misuse of opioid pain medications and other substances. Finally, we did not assess the potential reasons why participants believed they were mistreated in healthcare settings. Given that transgender people may hold multiple marginalized statuses, our findings suggest that healthcare providers should strive to create inclusive environments for all people regardless of their gender, substance use history, or other marginalized statuses.

5. Conclusion

The study highlights the relationship between gender, victimization, traumatic distress, and opioid pain medication misuse and the unmet BHtx needs of TGD people who misuse opioid pain medications and other substances. Addressing existing disparities in opioid pain medication misuse among TGD people requires systematic improvements in healthcare access, including efforts to create TGD-inclusive BHtx environments with providers who are equipped to recognize and treat the social and structural drivers of TGD health inequities, including opioid pain medication misuse. Future strategic guidelines and research investments aimed at eradicating the opioid crisis in the US should strive to prioritize populations disproportionately impacted by the epidemic, including TGD people.

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Highlights

- TGD people reported misusing opioid pain medications and other substances
- Healthcare stigma and social support were related to opioid pain medication misuse
- Opioid pain medication misuse was associated with having unmet BHtx needs

Table 1.

Characteristics of a sample of transgender adults in Massachusetts and Rhode Island, ages 18–73 years (N=562).

DEMOGRAPHICS		
Age	Mean	SD
Continuous Range: 18–73 Years	31.3	11.2
Young Adult	n	%
Yes: (18–29)	309	55.0
No (30+)	253	45.0
Race/Ethnicity		
White, non-Hispanic	460	81.9
Racial/ethnic minority	102	18.1
Gender Spectrum		
Trans woman	137	24.4
Trans man	180	32.0
Non-binary	245	43.6
Living with HIV		
No	550	97.9
Yes	12	2.1
Health Insurance Status		
No insurance	17	3.0
Public insurance	169	30.1
Private Insurance	376	66.9
VICTIMIZATION		
Physical or Sexual Abuse as a Child (n=546)		
No	211	38.6
Yes	335	61.4
Physical or Sexual Abuse in Adulthood (n=549)		
No	229	41.7
Yes	320	58.3
Everyday Transgender-Related Discrimination - Lifetime (n=553)		
Range: 0–44	18.3	11.2
Experiencing Stigma in a Healthcare Setting - Past 3 Years		
No	409	72.8
Yes	153	27.2
Harassed or Attacked in a Healthcare Setting - Past 3 Years		
No	502	89.3
Yes	60	10.7
MENTAL HEALTH & SELF-HARM		
Internalized Transphobia - Current (n=558)		
Absent	279	50.0
Neither fully absent not fully present	132	23.7

Present	147	26.3
Depression – Current (n=556)		
No	468	84.2
Yes	88	15.8
Anxiety - Current (n=557)		
No	484	86.9
Yes	73	13.1
Post-Traumatic Stress Disorder - Current (n=555)		
No	350	63.1
Yes	205	36.9
NSSI - Lifetime (n=546)		
No	206	37.7
Yes	340	62.3
Attempted Suicide - Lifetime (n=534)		
No	342	64.0
Yes	192	36.0
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SOCIAL SUPPORT - CURRENT		
Social Connectedness (n=544)		
Suboptimal	138	25.4
Optimal	406	74.6
Family Support of Gender Identity/Expression (n=524)		
Not Supportive	63	12.0
Somewhat supportive	331	63.2
Supportive	130	24.8
<hr/>		
SUBSTANCE MISUSE - PAST 12 MONTHS		
Hazardous Drinking		
No	351	62.5
Yes	211	37.5
Marijuana		
No	243	43.2
Yes	319	56.8
Hallucinogens		
No	507	90.2
Yes	55	9.8
Club Drugs		
No	539	95.9
Yes	23	4.1
Methamphetamine		
No	544	96.8
Yes	18	3.2
Cocaine		
No	538	95.7
Yes	24	4.3

Crack			
No	552	98.2	
Yes	10	1.8	
Benzodiazepines			
No	516	91.8	
Yes	46	8.2	
Heroin			
No	553	98.4	
Yes	9	1.6	
Opioid Pain Medication			
No	517	92.0	
Yes	45	8.0	
Number of Substances Misused		Mean	SD
Other than opioid pain medication: Range (1–9)		1.3	1.4
Including opioid pain medication: Range (0–10)		1.3	1.5
TREATMENT UTILIZATION - PAST 12 MONTHS			
Behavioral Healthcare (n=326) **		n	%
Yes, received		265	81.3
No, but need it		61	18.7

NSSI = non-suicidal self-injury

Club Drugs = MDMA (Methylenedioxyamphetamine), also called Ecstasy and Molly; GHB (Gamma-hydroxybutyrate), also known as G and Liquid Ecstasy; and Ketamine, also known as Special K and K.

** Restricted to people who misused substances in the past 12 months and needed behavioral healthcare.

Table 2.

Frequency of substance misuse by opioid pain medication misuse among transgender people who use substances in the past 12 months (N = 384)

	Total		Opioid Pain Medication				<i>P Value</i>
	N	%	No		Yes		
Opioid Pain Medication							
No	345	88.5	339	100.0	0	0.0	--
Yes	45	11.5	0	0.0	45	100.0	
Hazardous Drinking							
No	175	44.9	155	46.0	20	44.0	0.87
Yes	209	53.6	184	54.0	25	56.0	
Marijuana							
No	69	17.7	64	19.0	5	11.0	0.2
Yes	315	80.8	275	81.0	40	89.0	
Hallucinogens							
No	330	84.6	300	88.0	30	67.0	<.0001
Yes	54	13.8	39	12.0	15	33.0	
Club Drugs							
No	361	92.6	328	97.0	33	73.0	<.0001
Yes	23	5.9	11	3.0	12	27.0	
Methamphetamine							
No	366	93.8	331	98.0	35	78.0	<.0001
Yes	18	4.6	8	2.0	10	22.0	
Cocaine							
No	360	92.3	327	96.0	33	73.0	<.0001
Yes	24	6.2	12	4.0	12	27.0	
Crack							
No	374	95.9	337	99.0	37	82.0	<.0001
Yes	10	2.6	2	1.0	8	18.0	
Benzodiazepines							
No	338	86.7	316	93.0	22	49.0	<.0001
Yes	46	11.8	23	7.0	23	51.0	
Heroin							
No	375	96.2	337	99.0	38	84.0	<.0001
Yes	9	2.3	2	1.0	7	16.0	

Club Drugs = MDMA (Methylenedioxyamphetamine), also called Ecstasy and Molly; GHB (Gamma-hydroxybutyrate), also known as G and Liquid Ecstasy; and Ketamine, also known as Special K and K.

Table 3.

Multivariable logistic regression analyses examining factors associated with opioid pain medication misuse in the past 12 months among transgender adults in Massachusetts and Rhode Island (N = 562).

	Block 1: Demographics			Block 2: Demographics, Victimization, Mental Health, Social Support & Substance Misuse		
	Multivariable			Multivariable		
	aOR	95% CI	P-Value	aOR	95% CI	P-Value
DEMOGRAPHICS – CURRENT						
Young Adult						
No (30+)	1.00	----	----	1.00	----	----
Yes (18–29)	0.91	0.48–1.76	0.78	0.68	0.28–1.67	0.40
Race/ethnicity						
White (non-Hispanic)	1.00	----	----	1.00	----	----
Racial/ethnic minority	0.84	0.36–1.92	0.68	0.45	0.13–1.55	0.20
Gender Identity						
Trans woman	2.08	0.95–4.56	0.07	3.22	1.05–9.93	0.04
Trans man	1.65	0.74–3.67	0.22	2.90	0.94–8.91	<i>0.06</i>
Non-binary	1.00	----	----	1.00	----	----
Living with HIV						
No	1.00	----	----	1.00	----	----
Yes	5.74	1.41–23.40	0.01	9.01	1.19–68.18	0.03
Health Insurance						
No insurance	3.04	0.63–14.76	0.17	2.77	0.36–21.38	0.33
Public insurance	3.12	1.62–6.01	0.001	2.14	0.87–5.29	0.10
Private insurance	1.00	----	----	1.00	----	----
VICTIMIZATION						
Physical or Sexual Abuse as a Child						
No				1.00	----	----
Yes				0.78	0.29–2.07	0.61
Physical or Sexual Abuse in Adulthood						
No				1.00	----	----
Yes				1.20	0.43–3.31	0.73
Everyday Transgender-Related Discrimination - Lifetime						
Continuous				1.01	0.97–1.06	0.61
Experiencing Stigma in a Healthcare Setting - Past 3 Years						
No				1.00	----	----
Yes				5.51	1.84–16.54	0.002
Harassed or Attacked in a Healthcare Setting - Past 3 Years						
No				1.00	----	----
Yes				0.45	0.11–1.94	0.28
MENTAL HEALTH & SELF-HARM						
Internalized Transphobia - Current						

	Block 1: Demographics			Block 2: Demographics, Victimization, Mental Health, Social Support & Substance Misuse		
	Multivariable			Multivariable		
	aOR	95% CI	P-Value	aOR	95% CI	P-Value
Absent				1.00	----	----
Neither fully absent nor fully present				1.77	0.61–5.14	0.29
Present				1.43	0.52–3.96	0.49
Depression - Current						
No				1.00	----	----
Yes				0.43	0.10–1.78	0.24
Anxiety - Current						
No				1.00	----	----
Yes				1.22	0.33–4.52	0.77
Post-Traumatic Stress Disorder - Current						
No				1.00	----	----
Yes				1.41	0.50–3.95	0.52
NSSI - Lifetime						
No				1.00	----	----
Yes				0.73	0.25–2.13	0.56
Attempted Suicide - Lifetime						
No				1.00	----	----
Yes				0.69	0.27–1.78	0.45
SOCIAL SUPPORT - CURRENT						
Social Connectedness						
Suboptimal				0.33	0.14–0.80	0.01
Optimal				1.00	----	----
Family Support of Gender Identity/Expression						
Supportive				----	----	----
Somewhat supportive				----	----	----
Not supportive				----	----	----
SUBSTANCE MISUSE - PAST 12 MONTHS						
Number of Other Substances						
Continuous				2.74	1.94–3.89	<.0001

OR=Odds Ratio; aOR= Adjusted Odds Ratio; NSSI = non-suicidal self-injury; bolded values = significant at p<0.05.

** Not inclusive of opioid pain medications

Note. Blocked multivariable regression modeling was used. Demographics were entered into the first block. Variables significant at p<0.25 were entered into the final multivariable model. Both models adjusted for age and race/ethnicity.

Table 4.

Multivariable logistic regression analyses examining factors associated with needing behavioral healthcare in the past 12 months but not having received it among transgender adults who use substances in Massachusetts and Rhode Island (N = 326).

	Block 1: Demographics			Block 2: Demographics, Victimization, Mental Health, Social Support & Substance Misuse		
	Multivariable			Multivariable		
	aOR	95% CI	P-Value	aOR	95% CI	P-Value
DEMOGRAPHICS - CURRENT						
Young Adult						
No (30+)	1.00	----	----	1.00	----	----
Yes (18–29)	2.67	1.34–5.33	0.01	2.79	1.30–5.99	0.01
Race/ethnicity						
White (non-Hispanic)	1.00	----	----	1.00	----	----
Racial/ethnic minority	1.95	0.99–3.87	0.05	1.95	0.88–4.30	0.10
Gender Identity						
Trans woman	0.82	0.37–1.83	0.62	0.71	0.29–1.75	0.46
Trans man	0.65	0.33–1.30	0.22	0.65	0.30–1.40	0.27
Non-binary	1.00	----	----	1.00	----	----
Health Insurance Status						
No insurance	4.28	0.98–18.74	0.05	4.12	0.83–20.46	0.08
Public insurance	1.44	0.73–2.84	0.29	1.49	0.68–3.26	0.32
Private insurance	1.00	----	----	1.00	----	----
VICTIMIZATION - PAST 3 YEARS						
Experiencing Stigma in a Healthcare Setting						
No				1.00	----	----
Yes				2.45	1.14–5.26	0.02
MENTAL HEALTH & SELF-HARM						
Post-Traumatic Stress Disorder - Current						
No				1.00	----	----
Yes				0.41	0.19–0.87	0.02
Attempted Suicide - Lifetime						
No				1.00	----	----
Yes				0.58	0.28–1.16	0.12
SOCIAL SUPPORT - CURRENT						
Family Support of Gender Identity/Expression						
Not supportive				----	----	----
Somewhat supportive				0.31	0.12–0.80	0.02
Supportive				0.45	0.14–1.39	0.17
SUBSTANCE MISUSE - PAST 12 MONTHS						
Number of Other Substances						
Continuous				0.78	0.57–1.07	0.12

	Block 1: Demographics			Block 2: Demographics, Victimization, Mental Health, Social Support & Substance Misuse		
	Multivariable			Multivariable		
	aOR	95% CI	P-Value	aOR	95% CI	P-Value
Opioid Pain Medication						
No				1.00	----	----
Yes				3.14	1.03–9.63	0.04

OR=Odds Ratio; aOR= Adjusted Odds Ratio; NSSI = non-suicidal self-injury; bolded values = significant at p<0.05.

* Not inclusive of opioid pain medications

Note. Outcome: Needing behavioral healthcare in the past 12 months but did not receive it (ref=needed behavioral healthcare and received it). Blocked multivariable regression modeling was used. Demographics were entered into the first block. Variables significant at p<0.25 were entered into the final multivariable model.

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