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Adolescent substance use at the intersections of foster care, sexual orientation and gender identity, racial/ethnic identity, and sex assigned at birth[☆]

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ABSTRACT

Background: Lesbian, gay, bisexual, transgender, queer and questioning (LGBTQ) youth are overrepresented in foster care and report greater substance use during adolescence.

Objective: Using an intersectional lens, the current study investigates differences in foster care placement and variation in substance use at the intersections of foster care and sexual orientation, gender identity, racial/ethnic identities, and sex assigned at birth.

Participants and settings: A sample of 121,910 LGBTQ youth (grades 6–12) completed either the Minnesota Student Survey in 2019, the California Healthy Kids Survey from 2017 to 2019, or the 2017 LGBTQ National Teen Study.

Methods: Youth reported their substance use in the past 30 days (alcohol, binge drinking, cigarette, marijuana), social positions (sexual orientation, gender identity, racial/ethnic identities, sex assigned at birth), living arrangement (foster care or not), and grade in school. Logistic regression was used to examine the main and interaction effects of foster care and social positions on youth substance use.

Results: Results indicated significant differences in substance use at the intersection of foster care placement and youth social positions. Significant two-way interactions for foster care placement and social positions emerged predicting alcohol, binge drinking, and marijuana use.

Conclusions: Findings show that LGBTQ youth in foster care are at higher risk for substance use than those not in foster care. Particular support is needed for lesbian, gay, and questioning youth,

[☆] Notes: Throughout this article, we use the social position terms that participants selected as part of each survey, or the terms used in the source materials to be most accurate. Throughout, we follow APA's guidelines on bias-free language pertaining to personal identity terms.

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transgender youth, LGBTQ youth assigned male at birth, and Asian or Pacific Islander LGBTQ youth in foster care.

1. Introduction

Although there has been longstanding knowledge of lesbian, gay, bisexual, transgender, queer and questioning (LGBTQ) youth overrepresentation in homelessness, only recently have a small number of studies documented that LGBTQ youth are also overrepresented in foster care (Baams et al., 2019; Wilson et al., 2014). At the same time, well-known racial/ethnic disparities in foster care representation among youth exist, with Black and Native American youth proportionally overrepresented among youth in foster care relative to the general population (Cénat et al., 2021; Wildeman & Emanuel, 2014). There is a substantial gap, however, in the literature that explores the intersections of experiences in foster care with sexual orientation or gender identity (SOGI), sex, and racial/ethnic identity, particularly in the context of substance use (Grooms, 2020). Our understandings of risk and resilience related to foster care experience are hampered without greater specificity in population descriptions. Use of large datasets, such as the harmonized dataset in the current study, provides unique opportunities to examine the intersection of experiences in foster care with SOGI, as well as sex and racial/ethnic identity, to illuminate differences in youth substance use.

1.1. Describing youth in foster care

Disclosing minoritized sexual and gender identities to family members can place youth at risk of experiencing family rejection, neglect, and parental abandonment (Roberts et al., 2012). Family rejection based on youth sexual orientation or gender identity is associated with higher chance of contact with the child welfare system, contributing to overrepresentation of LGBTQ youth in foster care arrangements (Baams et al., 2019) and placement in group homes or congregate care settings (Wilson et al., 2014) where opportunities for permanency are low (McCormick et al., 2017). Among LGBTQ youth, research suggests that family rejection scores are highest for pansexual or asexual youth, transgender boys, and nonbinary youth (Gamarel et al., 2020), suggesting that these populations of youth may be among the most likely to be living in foster care arrangements.

However, research on LGBTQ youth in foster care is still emerging. Child welfare systems currently do not collect data about sexual orientation or gender identity, so estimates of how many youth in foster care are LGBTQ typically come from statewide or national surveys. Data collected from LGBTQ youth via online surveys may unintentionally exclude the experiences of youth living in foster care due to internet access disparities, fear of stigma, or not having disclosed their sexual or gender identity to others in their foster families. Despite these challenges, extant research indicates that LGBTQ youth are overrepresented in foster care placements (Baams et al., 2019; Wilson et al., 2014). For example, Baams et al. (2019) found that just over 30 % of youth living in foster care identified as LGBTQ in a statewide sample of California schools, whereas 11.2 % of youth identified as LGBTQ in a nationally representative sample, indicating a statistically significant overrepresentation of LGBTQ youth in foster care arrangements. No information is available yet about variation within sexual and gender diverse youth – that is, whether there are differences in foster care representation between lesbian or gay, bisexual, transgender or gender diverse, and questioning youth. This gap is particularly noteworthy, as previous research finds that rejection in families of origin varies by subpopulation (Gamarel et al., 2020), indicating the possibility of varying representation by social identities.

In addition to overrepresentation of LGBTQ youth in foster care, studies show that discrepancies also exist by racial and ethnic identities, with Native American and Black or African American youth overrepresented in both likelihood of child welfare contact and foster care placements. Likelihood of referral to Child Protective Services (CPS) is more common among families from historically marginalized racial or ethnic backgrounds, and referral disparities predict entrance into the child welfare system (Putnam-Hornstein et al., 2013). Differences in foster care placement mirror this trend. Data from 2000 to 2011 indicate that Native American and Black youth were at highest risk of foster care placement relative to youth from other racial or ethnic identities (Wildeman & Emanuel, 2014), and data from 2014 to 2018 indicates that in 20 counties across the United States, Black and Native American families were at higher risk of CPS investigation, foster care placement, and termination of parental rights (Edwards et al., 2021). Racial discrimination is the most reported factor associated with overrepresentation of Black youth in child welfare (Cénat et al., 2021). Evidence of racial discrimination can be identified in child welfare system practices: for example, Black children are more likely to be assigned to case workers with higher family removal rates (Doyle, 2007), and Black families are less likely to receive preservation services aimed at helping children stay at home (Cénat et al.). The numbers of male and female youth in foster care are roughly equal (51 % male in 2020) (United States Children's Bureau, 2021), and no significant differences have been found in foster care placement of youth by sex assigned at birth (Wildeman & Emanuel).

1.2. Foster care experiences and substance use

Research indicates that there are differences in substance use by living arrangement, with youth living in foster care reporting greater substance use by several metrics. For example, 1 in 5 (19 %) youth (ages 13–18) in the child welfare system met criteria for a substance use disorder (Aarons et al., 2001). Several more recent studies found that youth in foster care are more likely to report substance use than youth not in foster care settings, controlling for demographic differences (McDonald et al., 2014; Siegel et al., 2016). Substance use among youth in foster care are particularly relevant for LGBTQ youth, whom research indicates are also at greater

risk for substance use compared to heterosexual, cisgender youth due to stress exposure including identity-based stigma and discrimination (Day et al., 2017; Eisenberg et al., 2020; Fish et al., 2021). Although substance use among LGBTQ youth with experience in foster care is somewhat lesser known, the literature on LGBTQ youth in general provides some information about potential substance use rates for this population.

1.2.1. Substance use by SOGI, racial and ethnic identity, and sex assigned at birth

Lesbian, gay, or bisexual (LGB) youth are more likely to report current and lifetime cigarette, alcohol, and marijuana use than heterosexual youth, with some subpopulations within this group (i.e., bisexual youth, female youth) at particularly high risk (Underwood et al., 2020). Disparities in substance use between LGB and heterosexual youth have persisted, and in some instances worsened, over time (Watson et al., 2018). Less is known regarding substance use prevalence among transgender and gender diverse youth, though the extant literature suggests that prevalence of substance use (alcohol, cigarette, marijuana use) is higher for transgender youth relative to cisgender youth (Day et al., 2017; Eisenberg et al., 2020). LGBTQ youth are more likely to have prior and ongoing risk exposures that may contribute to substance use disparities. Given evidence that LGBTQ youth who experience family rejection are at higher risk of substance use (Ryan et al., 2009) and that discrimination, harassment, and rejection of LGBTQ youth in foster care arrangements is documented in the literature (Gallegos et al., 2011), it is likely that foster care experience will be associated with disparities in substance use for LGBTQ youth. The only prior study to investigate this topic found that LGBTQ youth in foster care reported more victimization and mental health problems (feeling depressed or considering suicide) than unstably or stably housed youth, but no differences in past 30 day substance use or being drunk or sick after drinking alcohol (Baams et al., 2019). However, this study combined all LGBTQ youth into a single category for comparison with cisgender heterosexual youth, and it is possible that disparities also exist within this population by sexual orientation and gender identity subgroups, or by sex assigned at birth and racial or ethnic identity. Increasing specificity in our descriptions of who is at risk has important systemic implications in terms of behavioral screenings and trainings for foster families.

Differences in substance use behavior among youth have also been documented by racial and ethnic identities, with White youth generally reporting higher rates of substance use and substance use disorders compared to youth of other racial or ethnic backgrounds. White youth have higher binge drinking, and alcohol, cigarette, and marijuana use compared to Black, Latino/a/x, and Asian American youth during mid-adolescence, a trend which persists until after age 30 (Chen & Jacobson, 2012). White young adults also report higher alcohol, tobacco, and opioid use disorders compared to Black and Latino/a/x young adults (Vasilenko et al., 2017). Finally, substance use also significantly differs by sex assigned at birth such that mid-adolescent males are more likely than their female counterparts to report current alcohol, marijuana, and tobacco use – use of other illicit substances tends to be more similar for male and female youth (Chen & Jacobson, 2012; Leatherdale & Burkhalter, 2012).

1.3. Intersections in substance use

Substance use patterns by racial and ethnic identities and sex assigned at birth have been found to differ for sexual and gender diverse populations such that sexually marginalized women, and especially those who are racially and ethnically minoritized, report greater prevalence in substance use relative to sexually marginalized men. Researchers who have investigated how intersections of race or ethnicity, sex assigned at birth, and marginalized sexual identity predict substance use find that disparities in smoking, binge drinking, and marijuana use are pronounced among LGB women (Schuler et al., 2020). These disparities are particularly greater for Black and Hispanic LGB women compared to White LGB women. Among sexually diverse young men, one study found that Black men had slower increases in alcohol and marijuana use over a 2.5 year period compared to White men (Swann et al., 2019). Another study found that among Black sexually diverse adults, women had higher substance use than men (Pérez et al., 2020). The intersection of gender identity and sexual orientation also predicts substance use – one study found that young transgender women who were not heterosexual had higher odds of binge drinking relative to heterosexual transgender women (Arayasirikul et al., 2018). Differences across gender identity by racial or ethnic identity have seldom been explored (Kidd et al., 2018), though one recent study found that transgender adolescents of color reported higher frequency of vaping relative to cisgender White adolescents (Felner et al., 2022). Notably, ways in which intersectionality relates to substance use behavior have been less studied for youth, and it is unclear whether adult patterns are replicated in youth samples. In our previous work using the same large datasets as used in the present study, we found that transgender and gender diverse youth of color (particularly Latina/x/o and Black/African American) bore the highest burden of substance use among youth in a wide variety of intersecting social positions (Eisenberg et al., 2022), providing evidence of important differences in substance use.

2. Current study

For social positions linked to overrepresentation in foster care, there may be distinct patterns of intersecting risk for substance use and misuse. Intersectionality, a critical, theoretical, and analytical tool, posits that the multiple overlapping social positions lived by an individual (e.g., gender, sexual orientation, race/ethnicity) reflect interlocking structural inequalities, with implications for health and wellbeing (Bowleg, 2012). These social positions therefore are not to be understood as measures of groups or categories of people, but proxies for society-level privilege or oppression. However, quantitative research on youth with foster care experiences has generally not examined outcomes using an intersectionality framework. This is evident to such an extent that the literature presented above is somewhat siloed into discrete categories (i.e., sexual orientation, racial/ethnic identities, sex assigned at birth) which does not reflect the reality of how oppression (and identities) intersect. An intersectional approach adds value by considering overlapping experiences

of oppression and/or privilege.

The current study extends research on foster care experiences of LGBTQ youth by exploring substance use prevalence at the intersections of SOGI, racial or ethnic identity, sex assigned at birth, and foster care placement with a large sample of LGBTQ youth. This intersectional lens yields important insights about substance use disparities within the LGBTQ youth population and informs prevention and intervention efforts to mitigate such disparities. The following research questions were investigated: 1) Are there differences in foster care placement at the intersections of sexual orientation and gender identity, racial/ethnic identities, and sex assigned at birth? 2) To what extent does substance use behavior vary across the intersections of foster care with sexual orientation and gender identity, racial/ethnic identity and sex assigned at birth? It was expected that LGBTQ youth with current or past experience in foster care would have a higher prevalence of substance use relative to youth without experience in foster care. With respect to SOGI subpopulations, racial or ethnic identity, and sex assigned at birth, these questions were considered exploratory.

3. Method

3.1. Data and participants

Data were drawn from a harmonized sample of three sources: (1) the Minnesota Student Survey (MSS), (2) the California Healthy Kids Survey (CHKS), and (3) the LGBTQ National Teen Survey (NTS). The MSS is an anonymous, statewide, school-based survey of Minnesota schools serving students in grades 5, 8, 9, and 11. Data are collected every three years. Data from the current study were collected between January and June 2019 from students in grades 9 and 11 (due to relevant survey items being used only on the high school version). The CHKS is an anonymous, statewide, school-based survey collected from students in California schools beginning in grade 5. Data are collected biannually (although some districts elect to participate annually), and data for the current study were collected from students in grades 6 through 12, during either the 2017–2018 or 2018–2019 school years (for schools that participated in both, we include only the 2018–2019 school year). In both school-based samples, surveys were administered at school via online or paper delivery. Parents were notified about the survey and asked to respond if they did *not* want their child to participate (i.e., passive consent), and students were asked to provide their assent to participate. The NTS is an online survey of LGBTQ youth, age 13–17 years, which aimed to assess factors that impact well-being for sexual and gender diverse youth in the United States. Data were collected between April and December 2017 in partnership with the Human Rights Campaign (HRC). Youth were recruited to participate in the NTS through HRC's community partners and via social media. Participants provided their assent to participate in the survey. An Institutional Review Board granted permission to waive parental consent to participate, as requiring this consent would pose a greater risk to youth than benefit. As part of the data cleaning process in all datasets, surveys of respondents who provided inconsistent responses (e.g., selecting "no" on lifetime cigarette use and "yes" on current cigarette use) or implausible responses (e.g., reporting use of a fictitious substance), or who responded that they answered "only some" or "hardly any" questions honestly, were identified and removed to improve quality (<2 % of surveys).

A single, harmonized dataset was created using all three datasets. Responses to similar questions on the three datasets were synchronized, yielding a single dataset with unified response options across all participants. For example, each dataset contained a question pertaining to current alcohol use – (a) MSS: "During the last 30 days, on how many days did you drink one or more drinks of an alcoholic beverage?"; (b) CHKS: "During the past 30 days, on how many days did you use one or more drinks of alcohol?"; (c) NTS: "During the past 30 days, on how many days did you have at least one drink of alcohol?". The response options to this question also varied by dataset – the CHKS and NTS included six response options to indicate the frequency of alcohol consumption, whereas the MSS included seven options. To create a harmonized variable, response categories were dichotomized such that 0 = 0 days and 1 = 1 or more days. The benefits of data harmonization include larger sample size and increased statistical power, which is particularly important for detecting interaction effects among relatively small intersecting identities.

Each dataset included questions assessing participant sexual orientation and gender identity (described below). The current investigation included participants who identified as lesbian or gay, bisexual, another marginalized sexual orientation, transgender or gender diverse, or questioning their sexual orientation or gender identity, who were in 6th – 12th grade, and who had data on at least one substance use variable. This resulted in a total sample of 121,910 participants. Of these, 7.3 % ($n = 8851$) were from the MSS, 83.9 % ($n = 102,244$) from CHKS, and 8.9 % ($n = 10,815$) from NTS. 9.6 % of participants identified as transgender, 11.3 % as questioning their gender identity, and 79.0 % as not transgender (cisgender). 70.2 % were youth assigned female at birth, and 29.7 % were youth assigned male at birth. In terms of racial/ethnic identity, 41.5 % of participants identified as Hispanic or Latino/a/x, 30.4 % as White, 11.7 % as Asian or Pacific Islander, 11.6 % as multiracial, and 3.7 % as Black or African American. Participants identified their sexual orientation as bisexual (40.2 %), questioning their sexual orientation (29.7 %), another sexual orientation (12.7 %), lesbian or gay (13.9 %), and heterosexual (3.5 %).

3.2. Measures

3.2.1. Foster care

Participants reported foster care experiences as follows: MSS: "Have you ever been in foster care?"; CHKS: "What best describes where you live?"; NTS: "With whom do you currently live?" Participant responses were coded as having experience in foster care if they indicated that they had been in foster care in the past year (MSS), that their current living arrangement included "foster home, group care, or waiting placement" (CHKS), or that they currently lived with foster parents (NTS). This yielded a dichotomous variable, 1 = *Foster care experience currently or in the past year*, 0 = *No foster care experience currently or in the past year*.

3.2.2. Sexual orientation

Participants reported on their sexual orientation in each of the three surveys (MSS: “How do you describe yourself?”; CHKS: “Which of the following best describes you?”; NTS: “How do you describe your sexual identity?”). Response options in all three surveys included “heterosexual (straight/not gay),” “bisexual,” “gay or lesbian,” and “questioning/not sure/I am not sure yet.” An additional category, “another sexual orientation,” was created using the CHKS “something else” response option combined with the “pansexual” and “queer,” response options in MSS and NTS and the “asexual” response option in NTS. Participants who selected “Decline to respond” in the CHKS ($n = 32,571$; 4.4 %) to this question were marked as missing. A substantial percentage of youth in the MSS selected “I am not sure what this question means” ($n = 1192$; 1.5 %) or “I don’t describe myself in any of these ways” ($n = 6671$, 8.4 %). Previous analysis with the harmonized dataset used in this study demonstrated that these students are more similar to heterosexual youth than any sexually minoritized group (Gower et al., 2022), and so these responses were also marked as missing. This yielded five total sexual orientation identity categories: 1 = *Lesbian or gay*, 2 = *Bisexual*, 3 = *Questioning*, 4 = *Heterosexual/straight*, 5 = *Another sexual orientation*. Due to selection criteria in the current study, all heterosexual participants were transgender, gender diverse, or questioning their gender identity.

3.2.3. Transgender identity

Gender was assessed on each of the three surveys (MSS: “Are you transgender, genderqueer, or genderfluid?”; CHKS: “Some people describe themselves as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?”; NTS: “What is your current gender identity?”). Responses were coded as transgender or gender diverse if participants selected “Yes/Yes, I am transgender” (MSS and CHKS) or as “trans male/trans boy,” “trans female/trans girl,” “non-binary,” “genderqueer/gender non-conforming” (NTS), and as questioning gender identity if participants selected “I am not sure about my gender identity” (MSS), “I am not sure if I am transgender” (CHKS), or who wrote in “questioning” as a response (NTS). This yielded three total categories, 0 = *Not transgender*, 1 = *Transgender and gender diverse*, 2 = *Questioning gender identity*. Response to this question was marked as missing if participants selected “I am not sure what this question means” in the MSS ($n = 250$; 2.2 %) or “Decline to respond” in the CHKS ($n = 4973$; 4.7 %).

3.2.4. Sex assigned at birth

In each survey, participants were asked to self-report their sex (MSS: “What is your biological sex?”; CHKS: “What is your sex?”; NTS: “What sex were you assigned at birth?”). Response options for all surveys were “male” and “female.”

3.2.5. Racial or ethnic identity

Participants were asked to describe their racial and ethnic identity (MSS: “How do you describe yourself?”; CHKS: “Are you of Hispanic or Latino origin?”/“What is your race?”; NTS: “How would you describe yourself?”). This variable was recoded to create mutually exclusive categories, 1 = *Not of Hispanic origin (NH) American Indian or Alaska Native*, 2 = *NH Asian or Pacific Islander*, 3 = *NH Black, African, or African American*, 4 = *Hispanic or Latino/a/x*, 5 = *NH White*, 6 = *NH multiracial*.

3.2.6. Substance use

Four substance use variables were assessed in each of the three surveys. Participants were asked, “During the last 30 days, on how many days did you... (a) drink one or more drinks of an alcoholic beverage? (b) have 5 or more drinks of alcohol in a row, that is, within a couple of hours? (c) smoke a cigarette? (d) use marijuana?” Responses were dichotomized for each question, 1 = *One or more days*, 0 = *0 days*.

3.2.7. Covariates

Participants reported their grade in school (6th – 12th), which was dummy-coded with 6th grade as the referent; participants who reported another grade (such as college or trade school) or who were not in school were marked as missing. Data source (MSS, CHKS, or NTS) was dummy-coded with CHKS as the referent.

3.3. Plan of analysis

As a preliminary step, we examined whether foster care experience significantly differed by or interacted with data source to predict substance use outcomes, in order to test whether differences in foster care experience varied by data source. This was an important possibility to rule out, as state-level differences in social services might systematically impact results (i.e., differences between California and Minnesota foster care services; Edwards et al., 2021).

To address the first research question, descriptive statistics for LGBTQ youth in foster care (by sexual orientation, transgender identity, sex assigned at birth, and racial or ethnic identity) were calculated and statistically compared using chi-square tests. To address the second research question, a series of logistic regression models were estimated predicting each of the four substance use variables. The largest group category was selected as the referent for each variable. Grade in school was included as a covariate in these models, given developmental differences in substance use behaviors during adolescence (Fish et al., 2021); dataset was also included as a covariate to control for sample differences in rates of substance use and broader contextual differences. The main effects models included key predictors (sexual orientation, transgender identity, sex assigned at birth, racial or ethnic identity, and foster care), adjusted for covariates (grade, dataset), and entered simultaneously.

Next, focal 3-way interactions were tested in models that included the following 3-way interaction terms: foster care x sexual

orientation x sex assigned at birth; foster care x sexual orientation x racial/ethnic identity; foster care x transgender identity x sex assigned at birth; foster care x transgender identity x racial/ethnic identity (each model included the associated 2-way interaction terms). For each model containing interaction terms, omnibus tests (specifically, multivariate Wald tests) were utilized to assess whether there were significant differences in interactions across all groups. For models with non-significant 3-way interactions, 2-way interaction models were tested. Models were estimated using complete data for the variables contained within the model; sample sizes ranged from 107,259–107,753. All analyses were conducted using R (R Core Team, 2021).

4. Results

4.1. Preliminary analysis

Preliminary descriptive statistics indicated significant differences in experiences with foster care across the data sources ($\chi^2(2) = 150.14, p < .001$) and differences in odds of substance use across data sources. Youth in the CHKS dataset were less likely to report using alcohol and more likely to report binge drinking, cigarette use, and marijuana use than youth in NTS, whereas youth in the MSS dataset were more likely to report all four substances than youth in the CHKS and NTS. Based on these findings, dataset source was included as a covariate in primary analyses. Despite average differences, there were no statistically significant interactions between data source and foster care experience.

4.2. Descriptive findings and main effects

A total of 854 participants, representing 0.7 % of the sample, reported either current or past year experiences in foster care. Foster care experiences across social positions (sexual orientation, transgender identity, sex assigned at birth, and racial or ethnic identity) are presented in Table 1. Consistent with expectations, there were no differences in the proportion of youth assigned male at birth and youth assigned female at birth who reported experience living in foster care. There were, however, significant differences by sexual orientation. Among those who were questioning their sexual orientation, 0.5 % had been in foster care; in contrast, 0.9 % of those who were heterosexual or another sexual orientation (e.g., queer, pansexual, asexual) had been in foster care. Transgender youth also had a higher prevalence of reporting foster care experience than youth who were not transgender or who were questioning their gender identity. Finally, there were significant differences by racial and ethnic identity. Proportionally greater Black or African American and Native American or Alaska Native youth reported foster care experience compared to youth from other racial/ethnic groups.

Among the total sample, 15.6 % of youth reported using alcohol, 7.2 % reported binge drinking, 4.2 % reported cigarette use, and 14.3 % reported any marijuana use in the past 30 days. Main effects from logistic regression analyses of substance use behaviors on foster care experience and social positions are presented in Table 2. LGBTQ youth with experience in foster care had significantly greater odds of reporting each substance use behavior in the past 30 days: 1.71 times the odds of alcohol use, more than twice the odds of binge drinking and marijuana use, and more than three times the odds of cigarette use than LGBTQ youth not in foster care.

Table 1
LGBTQ youth in living in foster care by social positions.

	Total sample N (%)	Not in foster care N (%)	Foster care, past 12 months or current N (%)	Chi-square (df)
Sexual orientation	121,910 (100 %)	120,419 (99.3 %)	854 (0.7 %)	44.69 ₍₄₎ **
Lesbian or gay	16,724 (13.9 %)	16,493 (99.3 %)	115 (0.7 %)	
Bisexual	48,496 (40.2 %)	47,926 (99.2 %)	381 (0.8 %)	
Questioning	35,834 (29.7 %)	35,488 (99.5 %)	163 (0.5 %)	
Heterosexual ^a	4241 (3.5 %)	4175 (99.1 %)	38 (0.9 %)	
Another sexual orientation	15,357 (12.7 %)	15,105 (99.1 %)	132 (0.9 %)	
Transgender identity				91.6 ₍₂₎ **
Not transgender	91,960 (79.0 %)	91,052 (99.4 %)	535 (0.6 %)	
Transgender	11,171 (9.6 %)	10,883 (98.6 %)	150 (1.4 %)	
Questioning gender identity	13,244 (11.4 %)	13,078 (99.2 %)	110 (0.8 %)	
Sex				0.06 ₍₁₎
Male	34,660 (29.8 %)	34,186 (99.3 %)	241 (0.7 %)	
Female	81,844 (70.2 %)	80,919 (99.3 %)	560 (0.7 %)	
Racial or ethnic identity				183.63 ₍₅₎ **
Native American or Alaska Native	1338 (1.1 %)	1289 (97.4 %)	35 (2.6 %)	
Asian or Pacific Islander	14,024 (11.7 %)	13,948 (99.7 %)	40 (0.3 %)	
Black or African American	4471 (3.7 %)	4361 (98.4 %)	72 (1.6 %)	
Hispanic or Latino/x/a	49,904 (41.5 %)	49,328 (99.3 %)	359 (0.7 %)	
White	36,523 (30.4 %)	36,128 (99.5 %)	199 (0.5 %)	
Multiracial	13,876 (11.6 %)	13,677 (99.1 %)	126 (0.9 %)	

Note.

** $p < .001$.

^a All heterosexual youth in this sample were transgender, gender diverse, or unsure if they were transgender (questioning gender identity).

Table 2
Logistic regression results predicting substance use: main effects.

	Alcohol use, past 30 days (n = 107,489)		Binge drinking, past 30 days (n = 107,711)		Cigarette use, past 30 days (n = 107,259)		Marijuana use, past 30 days (n = 107,753)	
	OR	97.5 % CI	OR	97.5 % CI	OR	97.5 % CI	OR	97.5 % CI
Unadjusted prevalence	15.6 %		7.2 %		4.2 %		14.3 %	
Foster care _{ref: Not in foster care} Foster care	1.71	1.43, 2.03	2.52	2.06, 3.07	3.49	2.81, 4.30	2.29	1.93, 2.72
Sexual orientation _{ref: Bisexual} Lesbian or gay	0.85	0.81, 0.90	0.90	0.84, 0.96	0.80	0.73, 0.88	0.77	0.73, 0.81
Questioning	0.59	0.56, 0.62	0.56	0.52, 0.60	0.53	0.49, 0.58	0.54	0.51, 0.57
Heterosexual	0.89	0.80, 0.99	1.14	1.00, 1.29	0.85	0.73, 0.99	0.96	0.87, 1.07
Another sexual orientation	0.69	0.65, 0.73	0.66	0.61, 0.71	0.73	0.66, 0.81	0.62	0.58, 0.66
Transgender identity _{ref: Not transgender} Transgender	1.28	1.21, 1.36	1.61	1.49, 1.74	2.54	2.32, 2.77	1.42	1.34, 1.52
Questioning gender identity	1.03	0.97, 1.10	1.25	1.15, 1.36	1.56	1.41, 1.73	0.89	0.83, 0.95
Sex _{ref: Female} Male	0.88	0.85, 0.92	1.07	1.01, 1.12	1.23	1.16, 1.31	0.86	0.83, 0.90
Racial or Ethnic Identity _{ref: Hispanic or Latino/a/x} Native American or Alaska Native	0.97	0.82, 1.15	1.24	0.99, 1.52	2.40	1.93, 2.95	1.27	1.07, 1.49
Asian or Pacific Islander	0.44	0.41, 0.47	0.41	0.36, 0.45	0.48	0.41, 0.55	0.32	0.30, 0.35
Black or African American	0.64	0.58, 0.71	0.66	0.58, 0.76	0.80	0.67, 0.95	1.16	1.06, 1.26
White	0.93	0.89, 0.97	0.87	0.82, 0.92	1.08	1.00, 1.16	0.86	0.82, 0.89
Multiracial	0.86	0.81, 0.91	0.82	0.76, 0.89	0.95	0.85, 1.06	1.01	0.95, 1.07

Note. OR = Odds Ratio. Models include controls for grade in school and data source.

Significant differences in substance use were also reported by sexual orientation, transgender identity, and racial or ethnic identity.

4.3. Foster care interactions

In tests of three-way interactions (combinations of sexual orientation, transgender identity, racial or ethnic identity, and sex assigned at birth with foster care experience), several models did not converge due to low cell size. The two smallest sexual orientation categories, heterosexual and another sexual orientation, were combined to bolster cell size and facilitate convergence. Omnibus tests using this revised category revealed no statistically significant three-way interactions predicting substance use indicators, suggesting that these combinations of social positions did not significantly predict substance use behavior (see Table S1 in supplemental materials). The five sexual orientation categories were then restored (i.e., heterosexual and another sexual orientation were considered separate categories) to test two-way interactions between social position variables. Results of omnibus tests of two-way interactions between foster care and each social position predicting substance use behaviors can be found in Table 3. Graphs of these interaction patterns are presented in Fig. 1. Because the pattern of results of interactions for each social position were consistent across substance use behaviors, we only present graphs for alcohol use in the past 30 days for each social position (for graphs predicting other substance use outcomes, see Figs. S1 & S2 in supplemental materials).

General patterns indicated that in groups where substance use was high overall, the additional burden of foster care did not elevate

Table 3
Logistic regression results predicting substance use: omnibus Wald test for 2-way interactions.

Foster care interactions with _(df) :	Alcohol use, past 30 days (n = 107,489)	Binge drinking, past 30 days (n = 107,711)	Cigarette use, past 30 days (n = 107,259)	Marijuana use, past 30 days (n = 107,753)
Sexual orientation ₍₄₎	13.0*	14.9**	4.0	7.7
Transgender identity ₍₂₎	9.8**	7.4*	0.66	6.1*
Sex ₍₁₎	27.0***	13.9***	1.1	13.6***
Race/Ethnicity ₍₅₎	14.6*	8.4	10.3	9.0
Dataset ₍₂₎	4.4	4.1	1.2	1.6

Note. Interactions are presented in the same table but were run separately. Chi-square values are reported in the table.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

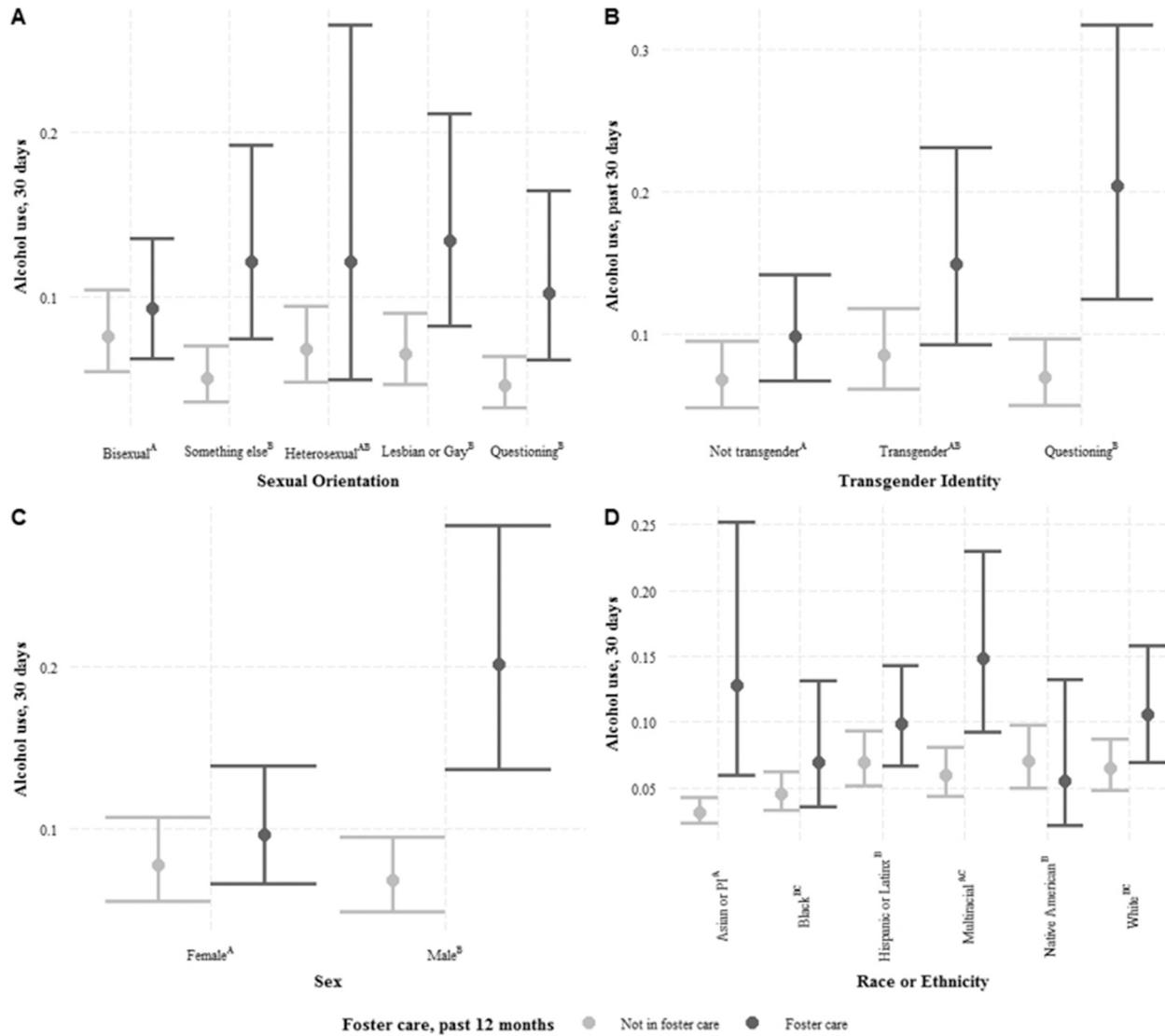


Fig. 1. Alcohol use at the intersections of foster care with sexual orientation, transgender identity, sex assigned at birth, and racial/ethnic identity: 2-way interactions. Note. Categories sharing a superscript do not differ at the $p < .05$ level.

substance use risk – in groups where substance use was lower, risk was heightened for youth in foster care. Panel A in Fig. 1 shows the statistically significant subgroup differences in the interaction between foster care and sexual orientation, specifically for bisexual youth compared to other sexual orientation groups. Experience in foster care was associated with higher prevalence of alcohol use among gay and lesbian youth (6.5 % prevalence for youth not in foster care versus 13.4 % prevalence in foster care; adjusted for covariates), questioning youth (4.6 % v. 10.2 %), and youth with another sexual orientation (5.1 % v. 12.2 %), but the prevalence of alcohol use was not significantly higher for bisexual youth by foster care experience (7.6 % prevalence for youth not in foster care versus 9.3 % prevalence in foster care) or for heterosexual youth (6.8 % v. 12.1 %). The same pattern was found for binge drinking (Fig. S1 in supplemental materials). Panel B shows the interaction between foster care and transgender identity, revealing that the ratio of alcohol use prevalence for youth in foster care versus not in foster care was significantly greater for questioning youth (7.0 % v. 20.4 %) compared to non-transgender youth (6.8 % v. 9.9 %). Although transgender youth in foster care also had higher prevalence than transgender youth not in foster care (8.6 % v. 15.0 %), this difference was not significantly different than the prevalence ratio for non-transgender youth. Similar prevalence patterns for binge drinking and marijuana use by transgender identity were found (Fig. S2 in supplemental materials). Panel C shows that in the interaction between foster care and sex assigned at birth, the ratio of alcohol use prevalence for youth in foster care versus not in foster care was significantly greater for males (6.8 % v. 20.1 %) than for females (7.7 % v. 9.6 %), a pattern that was consistent for binge drinking and marijuana use (Figs. S1 & S2). Finally, the intersections of foster care with racial/ethnic identity for alcohol use are shown in Panel D. The ratio of foster care experience and alcohol use prevalence was highest among Asian American youth (3.2 % prevalence for youth not in foster care versus 12.8 % prevalence for youth in foster care), and this ratio was significantly greater than for White youth (6.5 % v. 10.6 %), Native American or Alaska Native youth (7.0 % v. 5.5 %), Black or African American youth (4.6 % v. 7.0 %), and Hispanic or Latino/a/x youth (7.0 % v. 9.9 %). Multiracial youth had a similarly high ratio of alcohol prevalence by foster care experience (6.0 % prevalence for youth not in foster care versus 14.8 % prevalence for youth in foster care), and this was significantly greater than the prevalence ratio for Native American or Alaska Native youth and Hispanic or Latino/a/x youth. There were no other statistically significant group differences for other substance use/types.

5. Discussion

Prior studies have documented the link between foster care and substance use and have identified several notable group differences in substance use among youth with experiences in foster care. Only a few studies have documented overrepresentation of LGBTQ youth in foster care (Fish et al., 2019; Wilson et al., 2014), or associations between the intersection of LGBTQ identity and foster care with substance use (Baams et al., 2019). With harmonized data from three distinct data sources, this study examined the intersections of foster care experience with sexual orientation, gender identity, sex assigned at birth, and racial/ethnic identity, and associated patterns of four critical adolescent substance use behaviors.

Some of the patterns we document in representation across foster care experiences are consistent with prior studies. Our findings extend work regarding overrepresentation based on minoritized sexual orientations and foster care by demonstrating higher rates of foster care experience for youth who identify as bisexual or with another sexual orientation. Foster care representation was also high among heterosexual youth, all of whom identified as transgender or questioning their gender identity in the current sample. This finding is noteworthy because prior studies typically aggregate marginalized sexual orientation subgroups into global LGB categories (e.g., ; McCormick et al., 2017; Baams et al., 2019).

Consistent with prior research, the current study finds that transgender youth are overrepresented in foster care (Baams et al., 2019; Fish et al., 2019); our strategic combination of multiple data sources provides a large enough number of transgender youth in the combined sample to conduct analyses at the intersection of foster care and transgender identity distinct or separate from LGB identity. Transgender youth may be overrepresented due to greater family rejection (Gamarel et al., 2020), which could result in parental neglect or abandonment and subsequent foster care placement. Although more research is needed to explore the reasons for overrepresentation, we suggest that efforts to mitigate transphobia and cissexist prejudices within families would undoubtedly benefit transgender youth and may even reduce foster care placements, particularly in states such as Minnesota and California that have legislation supporting youths' rights to gender affirming care. However, recent legal efforts in several U.S. states to criminalize familial support of gender-affirming healthcare for transgender and gender diverse youth will potentially exacerbate this issue, leaving families in an untenable situation—by supporting their children, they risk CPS investigation and foster care placement (Gordon, 2022). Our results indicate that transgender and gender diverse youth are already overrepresented in foster care relative to cisgender sexually diverse youth, and attention should be turned to the reasons for this overrepresentation, rather than pursue policies that bring more transgender youth into the foster care system. Future research is needed to explore the impact of anti-transgender legislation by state and how this potentially links to the overrepresentation of transgender and gender diverse youth in the child welfare system.

Regarding sex assigned at birth and racial/ethnic identity of LGBTQ youth, our findings indicate that there are not strong differences in foster care experience based on sex assigned at birth, but Native American or Alaska Native youth and Black or African American youth are dramatically overrepresented among LGBTQ youth with experiences in foster care, while Asian or Pacific Islander youth are less likely to experience foster care. These results are consistent with documented disparities resulting from racial discrimination in child welfare system practices (Wildeman & Emanuel, 2014). Structural interventions might include improving cultural sensitivity of child welfare workers and requiring that preservation services be offered to Black and Native American families that would help children stay at home rather than in out-of-home care placements. Patterns of substance use behaviors reported in the current study are also similar to previous findings: among LGBTQ youth, bisexual and transgender youth have higher odds of reporting several substance use behaviors (Johns et al., 2019), and the patterns across racial/ethnic groups (Park et al., 2018; Shih et al., 2010) are largely consistent with prior studies.

Our findings extend work documenting disparities by social position to youth with current or past foster care experiences. Results for substance use at the intersections of foster care with sexual orientation and transgender identity revealed several patterns. First, while experience in foster care is associated with substance use behaviors for all sexually diverse youth, the risk for alcohol use and binge drinking for bisexual youth and heterosexual transgender and gender diverse youth is not heightened by foster care experience as it is for youth who are gay/lesbian and other sexual identities. For bisexual youth in particular, who are already at high risk for alcohol use and binge drinking, and are also overrepresented in foster care, this pattern may represent an inuring effect (Raver & Nishii, 2010) of intersecting social positions linked to vulnerability: being in multiple high-risk social positions does not add to the already high risk for either social position in this instance. However, our finding that youth with foster care experiences who were lesbian, gay, questioning, or another sexual orientation had significantly higher levels of substance use than those who did not have recent experience in foster care, may be missed in studies with aggregated samples. Qualitative studies that include interviews with LGBTQ youth about their experiences in foster care document that foster parents' acceptance and willingness to discuss issues related to sexual orientation and gender identity greatly benefit youth well-being (McCormick et al., 2016), though studies often do not distinguish unique experiences of LGBTQ youth in foster care. This finding points to potential differences based on sexual orientation in youth experiences in foster care that deserve further investigation to inform targeted intervention efforts.

With respect to transgender identity, the current study found that alcohol use and binge drinking also differed at the intersection of foster care, yet the group with highest odds for these alcohol-related substance use behaviors were youth questioning their gender identity who had foster care experience. Distinct from the pattern for bisexual youth, this intersection represents a social position with even higher alcohol use and binge drinking patterns. Results for substance use patterns at the intersections of foster care with sex assigned at birth and racial/ethnic identity (among LGBTQ youth) revealed that although foster care experience is generally a risk factor for all youth substance use behaviors, the odds are concentrated for youth with experience in foster care who were assigned male at birth (for alcohol use and binge drinking) or who are Asian or Pacific Islander youth (for alcohol use). These patterns are important for prevention and intervention efforts. Youth assigned male are understood to be at higher risk for use of many substances (SAMHSA, 2016), and child welfare efforts at substance use prevention are particularly relevant for this group. By contrast, Asian and Pacific Islander youth at this age range report lowest overall risk (Shih et al., 2010), so it is important to recognize the elevated risk that is conferred by foster care experience for LGBTQ Asian and Pacific Islander youth, a group that may often be assumed to be a lower risk for substance use prevention or counseling, even in the context of child welfare (Choi & Lahey, 2006; Sabato, 2016). Additional research is needed regarding intersectional differences that may be linked with variation in the underlying reasons for substance use for LGBTQ youth in foster care, which could include the use of substances to cope with negative experiences or to enhance positive affect (Dow & Kelly, 2013). Such research would be greatly beneficial in informing intervention efforts.

Finally, it is notable that we found no interaction between foster care experience and the three distinct data sources because despite differences in the prevalence of foster care experiences, and in rates of substance use across the data sources harmonized here, the role of foster care in substance use did not differ based on the data source. This finding underscores that the consistent intersections documented here between foster care and personal characteristics deserve further scrutiny.

5.1. Strengths and limitations

This study has the advantage of the strategic harmonization of three large samples that allow the study of intersections of foster care (a rare occurrence at a population level) with sexual orientation and gender identity, and with sex assigned at birth and racial/ethnic identity. We are unaware of prior studies that allow investigations of, for example, transgender identity at the intersection of other distinctive social positions like experience in foster care.

At the same time, there are several limitations. The different timeframe for the experience of foster care across data sources has been noted and may be a source of misclassification (yet it is also notable that except for prevalence, there was no interaction between foster care and data source in association with substance use). Our sample of LGBTQ youth with foster care experiences might have been limited by the sampling frame. Research indicates that LGBTQ youth and youth in foster care are more likely to be "pushed out" of school due to systemic barriers (Clemens et al., 2017; Snapp et al., 2015), which may have limited the number of youth reached through our school-based samples. Also, the study samples had somewhat different approaches to categorizations of sexual orientation. Although we have the advantage of disaggregating among monosexual (gay/lesbian) and plurisexual (bisexual) as well as questioning and other sexual orientations, the MSS and NTS specifically allowed youth to select queer, pansexual, and asexual identities which were not included in the CHKS and thus not a focus here. New studies document meaningful differences among youth based on diversity in sexual and gender identities (Gower et al., 2022; Watson et al., 2020), and future studies should investigate such diversity at the intersections of foster care. Given inclusion criteria in the current study, the subsample of heterosexual transgender and gender diverse youth was relatively small and was combined with youth of another sexual orientation for the three-way interaction analysis. This approach was not optimal, as research shows that there are indeed differences among transgender and gender diverse youth by sexual orientation with respect to substance use (Arayasirikul et al., 2018). A sample with more heterosexual transgender and gender diverse youth is needed to examine potential differences more thoroughly.

Another important limitation pertains to the statistical approach used here to study intersectional experiences of foster care with social positions in association with substance use behaviors. Using logistic regression analyses, we do not find intersecting patterns more complex than the intersection of foster care with each social position individually (that is, we found no three-way interactions). However, despite the sample size enabled by harmonizing three large data sources, the test of interactions beyond three variables is infeasible. The limitations of quantitative statistical approaches have been criticized for applications in intersectionality research (Bauer et al., 2021). At the same time, notwithstanding these important critiques for quantitative approaches to the study of

intersectionality, this study illuminates distinctive patterns of representation in foster care across social positions, including sexual orientation and gender identity. It also provides distinct information regarding the prevalence of risk for substance use behaviors across personal characteristics at the intersection with foster care. Qualitative research into the lives of LGBTQ youth in foster care is needed to aid researchers' understanding of the multiple risk and protective factors that drive substance use among youth and to illuminate the complex, individual experiences of queer adolescents growing up in foster families.

Findings hold implications for researchers and practitioners who strive to support LGBTQ youth in foster care. First, in order to identify populations who are most burdened by substance use in adolescence, data regarding youth sexual orientation and gender identity should be collected by child welfare agencies alongside other demographic information. LGBTQ youth in foster care have been called an "invisible" population because, although these youth are overrepresented in foster care, agencies may not collect information about youth sexual orientation or gender identity (Fish et al., 2019). Second, practitioners should be aware that youth who have experienced foster care placement are likely to have used a range of substances (alcohol, cigarettes, marijuana), and to have engaged in risky substance use (binge drinking). Youth in foster care may benefit from foster families who are educated about youth substance use and prevention strategies. Finally, intersectional patterns revealed that LGBTQ youth in foster care experienced greater average likelihood of alcohol use and binge drinking relative to cisgender heterosexual youth in foster care, indicating that health disparities may be perpetuated and exacerbated by foster care placement. This suggests the need to address heterosexist and cissexist oppression within child welfare systems to better support LGBTQ youth, which might include interventions such as: educating child welfare workers about the unique needs and experiences of LGBTQ youth, allowing youth to decide when and how to come out, advocating for youth needs across diverse contexts (e.g., in schools, extracurricular activities), and training and monitoring foster care placements on how to create inclusive and supportive environments for LGBTQ youth.

6. Conclusions

Using a large sample of LGBTQ youth, the current study documents disparities in foster care placement by sexual orientation, gender identity, and race/ethnicity and disproportionate substance use risks by foster care placement with respect to these social positions. These findings shed light on representation differences in foster care experiences and how those experiences are associated with greater substance use prevalence for youth at specific intersecting social positions. In particular, findings indicate the need for efforts to support lesbian, gay, and questioning youth, transgender youth, LGBTQ youth assigned male at birth, and Asian or Pacific Islander LGBTQ youth in foster care. Efforts to ensure foster placements understand and support LGBTQ youth should be developed and bolstered through education, training, and screening processes. There is great need for future research detailing ways to support transgender and gender diverse youth in foster care, ways to respond to racist practices leading to overrepresentation of Black and Native American youth in foster care, and development of substance use prevention strategies for LGBTQ youth in foster care.

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Data availability

The authors do not have permission to share data.

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Declaration of competing interest

The authors have no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chiabu.2023.106042>.

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