Discrimination, gender dysphoria, drinking to cope and alcohol harms in the UK trans and non-binary community.

TITLE PAGE

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ABSTRACT

Background Trans and non-binary people may be at increased risk of alcohol harms, but little is known about motives for drinking in this community.

Aims This study explored the relationship between risk of alcohol dependence, experience of alcohol harms, drinking motives, dysphoria and discrimination within a United Kingdom sample of trans and non-binary people with a lifetime history of alcohol use.

Methods A cross-sectional survey was co-produced with community stakeholders and administered to a purposive sample of trans and non-binary people from 1st February until 31st March 2022. A total of 462 respondents were included - 159 identified as non-binary and/or genderqueer (identities outside the man/woman binary), 135 solely as women, 63 solely as men, 15 as another gender identity, 90 selected multiple identities.

Results Higher levels of reported discrimination were associated with higher risk of dependence and more reported harms from drinking. Coping motives, enhancement motives, and drinking to manage dysphoria were associated with higher AUDIT scores. Social, coping, and enhancement motives alongside discrimination and drinking to have sex were associated with harms. The relationship between discrimination and risk of dependence was mediated by coping motives and drinking to manage dysphoria.

Conclusions: Further to these associations, we suggest that reducing discrimination against trans and non-binary communities might reduce alcohol harms in this population. Interventions should target enhancement motives, coping motives and gender dysphoria. Social and enhancement functions of alcohol could be replaced by alcohol free supportive social spaces.

Short summary

In a cross-sectional co-produced survey of 462 UK trans and non-binary respondents, an association was found between experiences of discrimination, AUDIT scores and alcohol harms. Social, coping, and enhancement motives and drinking to have sex were also associated with harms. Drinking to cope mediated the relationship between experiences of discrimination and AUDIT.

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INTRODUCTION

Excessive alcohol use is a leading risk factor for global disease burden (GBD 2016 Alcohol Collaborators, 2018). However, research to understand its causes often suffers from lack of diversity (Davies et al., 2021). In particular, historically, many studies have neglected to identify participants whose gender does not correspond to binary sex categories or sex registered at birth (Flentje et al., 2020). Alcohol research that has considered transgender (trans) and non-binary participants is often limited in the way that it identifies these populations, conflating the measures of sex with those of gender (Gilbert et al., 2018) or failing to disaggregate gender minority from sexual minority participants (Connolly & Gilchrist, 2020).

Nevertheless, existing research has pointed towards important differences in alcohol use patterns between trans and cisgender (cis) people (see Box 1 for clarification of terminology). For example, it has been suggested that trans and non-binary people engage in more heavy episodic drinking and are at greater risk of dependence than cisgender people of all sexual orientations (Connolly et al., 2020; Connolly & Gilchrist, 2020; Connolly et al., 2022; Hughto et al., 2021; Reisner et al., 2015; Scheim et al., 2016).

[Insert Box 1]

While being trans is not an inherent risk factor, (gender) minority stress theories suggest that a combination of health and social stressors increases the risk for excessive alcohol consumption (Hendricks & Testa, 2012; Jones et al., 2022; Lefevor et al., 2019; Meyer, 2003; Timmins et al., 2017). One stressor specific to trans and non-binary people is gender dysphoria, which is the intense psychological discomfort that can be associated with gender incongruence (Cooper et al., 2020). Gender dysphoria may be associated with alcohol consumption as a means to cope

(Gonzalez et al., 2017). Trans and non-binary people are also at high risk of experiencing problems from other people's alcohol consumption, and Black trans people are subjected to a greater risk of violence from others' drinking (Arayasirikul et al., 2017). The intersection of ethnicity and gender minority status is associated with higher distress and increased drinking to cope (Malta et al., 2020), but there is a lack of evidence about how these factors interact.

Although minority stress offers a plausible explanation, this fails to consider positive reasons for drinking. Bars and clubs are often a place of acceptance and celebration for the lesbian, gay, bisexual transgender, queer, intersex and other sexual and gender minorities (LGBTQI+) community, and as such may offer a space for community gathering and/or a welcoming space for people newly exploring their identities (Cerezo et al., 2019). Such social support and community connectedness may mediate the relationship between minority stress and poor health outcomes (Wall et al., 2022). However, existing alcohol research that identifies trans and non-binary participants has failed to consider these variables.

Overall, previous research on alcohol consumption includes trans and non-binary communities in limited ways (Connolly & Gilchrist, 2020). The present study aimed to explore the relationship between risk of alcohol dependence, gender dysphoria, drinking motives, alcohol harms, and discrimination within a United Kingdom (UK) sample of trans and non-binary people with a lifetime history of alcohol use.

METHOD

Design and recruitment

This study was co-produced with a paid group of trans and non-binary people who reported current or historical alcohol use. Group members were diverse in terms of age, gender identity, sex registered at birth, sexual orientation, ethnicity, (dis)ability, and neurodiversity. To ensure the whole project was informed by community lived experiences, the group was consulted via

email, telephone or video calls during development of the study research questions and protocol, development of the materials, operationalisation of key variables (e.g., gender identity) for data collection and analysis, recruitment, interpretation of the data, and communication of the results. They were asked how each aspect of the research could be made maximally inclusive and all feedback was incorporated into the study. The group members were included as co-authors in associated manuscripts.

An online cross-sectional survey was administered using Qualtrics software and ran from 1st February- 31st March 2022. Collaborators contributed to a recruitment campaign across personal networks and social media platforms Facebook, Instagram, Reddit and Twitter. The collaborators involved in the recruitment campaign were Drugs and Me, LGBT Foundation, LGBT Switchboard, Live Through This, London Friend, Stonewall, Trans Actual, Trans Radio UK and the UK National LGBT Health Officer. Author 2 and members of the team at Drugs and Me developed materials and organised events to promote the study and raise awareness about the topic (see supplementary materials).

The study protocol was published on the Open Science Framework prior to recruitment (Davies et al., 2022a).

Participants

Eligible participants were ≥18 years old, UK-based, had a lifetime history of alcohol use and identified as transgender (trans), non-binary, genderqueer or gender non-conforming in any way. Non-binary and genderqueer are both terms that encompass identities outside of the man/woman binary. Non-binary and genderqueer people may feel their gender is fluid, be unsure of their gender identity, or not identify with any particular gender (i.e., agender). To maximise participants' control over their data, for ethical reasons, they could withdraw their consent by terminating participation prior to clicking the submit button at the end of the survey. Responses from those who did not click the submit button responses were deleted. Thus, people

who did not click to submit their responses were considered to have withdrawn their consent. Participants were incentivised to participate with a raffle for £20 vouchers for a historically significant LGBTQI+ community bookshop.

In total, 770 people clicked on the survey link, 723 gave their consent to take part and 713 people indicated that they identified as trans or non-binary genderqueer and gender non-conforming in any way and started the survey. Of the 589 complete responses, 22 people failed one or more attention check and so their data were discarded. Two indicated they did not live in the UK. Finally, 565 complete responses were retained.

Measures

Demographics: Demographic details, including gender, intersex status, sex registered at birth, age, personal pronouns, ethnicity, sexual orientation, neurodiversity, education, UK region, and employment status were collected to understand the composition of the sample.

Gender identity: Gender identity questions were developed following the LGBT Foundation good practice guide to monitoring sexual orientation and trans status (LGBT Foundation, 2021). At the start of the survey, respondents were asked "Do you identify as transgender (trans), non-binary, genderqueer or gender non-conforming in any way?" (yes/no). People who provided a positive answer progressed in the survey and were presented with the following: "Gender identity is defined as the gender(s) that you experience yourself as; it is not necessarily related to your assigned sex at birth. What is your gender identity? Use the free-space option, if required." (Man (including trans man); Woman (including trans woman); Non-binary; Genderqueer; Other gender identity (please self-describe). Respondents could select more than one response to this question. Then they were asked: "What sex were you assigned at birth?" (male; female; prefer not to say).

Alcohol harms

Two indices of alcohol related harms measured risk of dependence and experienced harms:

Risk of dependence: The Alcohol Use Disorders Identification Test (AUDIT) is a widely used standardised screening tool to identify risk of hazardous, harmful and dependent alcohol use (Babor et al., 2001). We used the full ten-item AUDIT in this study to assess risk of dependence. Prior to completing AUDIT, participants were presented with an illustration of a range of commonly consumed drinks and the number of units they contained. In the UK, a unit of alcohol is 10 ml (8 g) of pure alcohol. AUDIT's third item regarding heavy episodic drinking was adapted to refer to consumption of six or more drinks and not refer to gender. A higher AUDIT score indicated a higher risk of alcohol dependence (10 items; α =.870).

Specific harms: There were 13 harms on the list which included being sick; embarrassed; missing work or study and taken more sexual risks than usual (adapted from unprotected sex in the original scale (Davies et al., 2017) as it was deemed more relevant by the advisory group). Participants indicated yes/no as to whether the harms had occurred in the last year. A higher score indicated a greater number of harms.

Gender congruence: The Transgender Congruence Scale (Kozee et al., 2012) measured the congruence between current gender expression and desired gender. It is a twelve-item measure, using five item Likert scale responses to statements such as "I experience a sense of unity between my gender identity and my body" (from 1 = strongly disagree to 5 = strongly agree). Higher scores indicate a lower level of gender dysphoria. There are two subscales: appeared congruence (physical appearance matches lived gender identity; (9 items; α=.918) and gender identity acceptance (pride in trans identity; 3 items; α=.748). Reliability for the scale a whole was also good (12 items; α=.887) suggesting the scale was internally consistent.

Discrimination, gender minority stress and distress: We used Arayasirikul et al.'s (2017) seven-item scale developed specifically for a trans and non-binary sample, including both distal and proximal stressors (e.g. "Have you ever been verbally abused or harassed because of your gender identity or presentation?"). This list was added to by the community advisory group and the final list consisted of 15 items (see supplementary figure. 2 for all items). Items are dichotomous with a high score indicating a greater experience of discrimination.

Distress: To assess current levels of mental distress, the six item Kessler scale (K6) was utilised (Kessler et al., 2002). Items included "During the past 30 days, about how often did you feel nervous?" (all of the time, most of the time, some of the time, a little of the time, none of the time). The scale was reversed scored so that a higher score indicated a higher level of distress for ease of interpretation (6 items; α =.866).

Loneliness: The 3-item UCLA loneliness scale (Russell, 1996) asked participants to rate how often they have felt (i) lacking companionship, (ii) left out, (iii) isolated from others (hardly ever or never; some of the time; often). A mean loneliness score was calculated (3 items α=.831) where a higher score indicated a higher loneliness.

Drinking motives: To measure drinking motives, we used the revised drinking motives questionnaire (DMQ-R), which has good test-retest reliability (Arterberry et al., 2012). It explores four dimensions: conformity (negative/external; 5 items; α =.792); coping (negative/internal; 5 items; α =.856), enhancement (positive/internal; 5 items; α =.817) and social (positive/external; 5 items; α =.880) (Cooper, 1994; Cooper et al., 2016; Fernandes-Jesus et al., 2016). People are asked to rate how frequently they consume alcohol for a list of 20 reasons (Supplementary Table 1). Items are rated from 1 (Almost never/never) to 5 (Almost always/always) and summed. Each subscale therefore has a possible score of 25. Two additional motives were added to the list by our community advisory group: "How often do you drink to manage your gender dysphoria?"; and "How often do you drink to have sex?".

Three attention check questions were added into the transgender congruence scale, AUDIT and the DMQ-R. Attention check questions are used to identify careless responding and have one clear unambiguous answer or require a specific response (Jones et al., 2023). In our study we asked participants to select a particular answer, such as somewhat agree.

The full survey questions can be viewed on the Open Science Framework (Davies et al., 2022b).

Analyses

Since people could select more than one identity, some categories had very small numbers. To allow sufficient numbers for meaningful comparisons we were advised by the community advisory group to collapse the responses as follows: man only; woman only; non-binary and/or genderqueer; other gender identity; and multiple gender identities (excluding non-binary and genderqueer who are represented in the third category). We then descriptively explored scores on all measures by these gender identity categories. Missing data was managed by pairwise deletion. Differences between gender categories on the study measures were explored using ANOVA, with a Bonferroni correction applied 0.004 as there were 14 variables compared. As there were few differences between the gender groups (Table 2; Table 4) subsequent main analyses included the whole sample. Relationships between measures were explored using Pearson correlations. Then, two regression models predicting 1) AUDIT (linear regression) and 2) harms (negative binomial regression), were constructed with drinking motives subscales, discrimination, K6, loneliness, gender congruence, drinking to cope with gender dysphoria, and drinking to have sex as predictors. We applied a conservative alpha value of $p<.005$ when determining significant predictors due to including 10 predictors. Dummy coded gender variables, ethnicity and sexual orientation were excluded from the models as they were non-significant. Age was also not significant but was excluded due to the large amount of missing data. We explored whether drinking motives mediated the relationship between discrimination and AUDIT using the PROCESS macro in SPSS (Hayes, 2012).

RESULTS

A total of 462 people were included in this paper. In the sample, 159 people identified as non-binary and/or genderqueer, 135 solely as women, 63 solely as men, 15 as another gender identity and 90 people selected multiple gender identities. The age range of those who reported their age was 18-76 (median = 26, 25th percentile = 22, 75th percentile = 33). However, 30% of the respondents did not input their age. The majority of the people reported having a white ethnicity (N= 422; 91.3%). The most commonly selected sexual orientations were as follows: 25.3% identified as bi and/or pansexual; 20.2% identified as both bi and/or pansexual and queer (Table 1).

[Insert Tables 1 & 2]

Study measures were explored by gender identity (Table 2). Considering multiple comparisons and therefore adjusting the alpha level to 0.004, significant differences between gender groups were found for AUDIT scores, discrimination, and gender congruence. Men had higher AUDIT scores compared to women and those with multiple gender identities. Participants identifying as non-binary and/or genderqueer reported significantly lower discrimination. Those identifying as non-binary and/or genderqueer and those with other identities reported lower total gender congruence scores than men or women.

AUDIT scores were significantly positively correlated with all other measures apart from social and conformity motives (Table 3). None of the correlations indicated multi-collinearity Correlations between AUDIT and harms with the predictor variables were also explored by gender group (Table 4). The strongest correlations between the outcome variables and discrimination were observed in men.

[Insert Table 3 & 4]

Regression models are presented in Table 5. The first model accounted for 50.6% of the variance in AUDIT scores (R^2=.50.6, F (10,442) =45.18, p<.001). Coping motives, enhancement motives and drinking to manage gender dysphoria contributed significantly to the model. Coping motives were the strongest predictor in the model (β=.407, t=7.93, p<.001). The second model was statistically significant X^2 = 155.68, df=10, p<.001. Social motives was the strongest predictor in the model, when accounting for multiple predictors (OR = 1.042 95CI = 1.013; 1.073).

Results of the multiple mediation model is presented in Table 6. The tests of indirect effects indicated that coping motives and drinking to manage gender dysphoria significantly mediated the relationship between discrimination and AUDIT score. This suggests that the impact of discrimination on AUDIT scores was greater for respondents scoring more highly on the coping motives sub-scale and on reporting drinking to manage gender dysphoria.

[Insert Table 5 & 6]

DISCUSSION

This paper aimed to explore the relationship between alcohol consumption, drinking motives, alcohol harms, discrimination and distress. The mean AUDIT score of the sample fell into the increasing risk category of the scale and men had the highest AUDIT scores. AUDIT scores were predicted by coping motives, enhancement motives and drinking to manage gender dysphoria. Alcohol harms were predicted by social motives. Drinking to cope and drinking to manage gender dysphoria mediated the relationship between discrimination and AUDIT scores.

Consumption

Few other studies have compared gender identity subgroups, but our findings are in line with those from Canadian research, which found higher alcohol consumption in transmasculine compared to transfeminine participants (Scheim et al., 2016). Higher AUDIT scores in our study

may be explained, in part, by gendered expectations relating to alcohol and masculinity (de Visser & Smith, 2007). Our study adds to the literature by pointing towards differences in consumption in a UK sample and highlighting the need to understand if masculine expectations mean that trans men are at greater risk of dependence.

Discrimination and coping motives

Non-binary and/or genderqueer participants were significantly less likely to report experiencing discrimination compared with other groups. Despite this, discrimination was still common among this group. Commonly reported experiences included misuse of pronouns, being deadnamed (referred to by birth name), and having identity questioned. This aligns with findings from a longitudinal study in the USA which found the majority of non-binary people experienced some form of discrimination daily (Truszczynski et al., 2022). Across our sample, we found that those who experienced more discrimination, regardless of gender identity, were more likely to report alcohol use as a means to cope, a finding that aligns with Truszczynski et al., (2022). Crucially, we found that coping motives significantly mediated the relationship between discrimination and AUDIT scores.

Congruence and gender dysphoria

Congruence scores were lower in people reporting other identities compared to the remaining gender groups. It appeared that feeling more authentic and comfortable with gender appearance was linked with lower AUDIT scores and harms. Previous research has found an association between increasing gender dysphoria and problematic alcohol use (Gonzalez et al., 2017). Our findings extend previous research in this area by showing that drinking to cope with gender dysphoria is an important area for further research, as this mediated the relationship between discrimination and AUDIT.

Loneliness and social motives

Loneliness was associated with distress as well as alcohol consumption and harms, which is in line with research showing that loneliness is a consistent predictor of poor health outcomes. (Leigh-Hunt et al., 2017). However loneliness was not significant in regression models. Social motives to drink, however, added to the prediction of harms, but not AUDIT scores. These findings underscore the need to explore facets of social drinking that may lead to harm reduction, while retaining the positive features of being with others.

Enhancement and drinking to have sex

Enhancement motives relate to the subjective feelings of alcohol intoxication and effect on mood and predicted AUDIT scores. Other researchers have highlighted the role of alcohol and other drugs as a way to enhance sexual experiences (e.g. Aldridge, 2020; Moyle et al., 2020). However, trans and non-binary people are more likely than cis people to experience sexual violence after drinking (Connolly et al., 2021), highlighting that the positive and negative potential facets of this motive need to be disentangled in future research.

Implications

Health professionals should adapt alcohol interventions for trans and non-binary patients, and take into account predictors of AUDIT and harms. For example, alcohol screening tools may need to be adapted to identify those at risk of harm (Chapa Montemayor & Connolly, 2023; Flentje et al., 2020). A recent Scottish study highlighted the need for effective monitoring of gender identity as a way to reduce disparities in alcohol services (Dimova, O'Brien, Lawrie, et al., 2022). However, at present, there is a paucity of well-designed theoretically informed studies on interventions for substance use in trans and non-binary patients (Glynn & van den Berg, 2017). There are some promising studies from the United States on improving resilience skills in trans people (Merrill, 2021), brief alcohol interventions for LGBTQ+ populations

(Mirabito, 2021), and using cognitive behavioural therapy with gender diverse women (Pachankis et al., 2020). However, it is essential to develop interventions that are relevant and targeted to a UK population. Self-help tools, such as digital interventions, also need to incorporate targeted tools for gender diverse populations (Dimova, Elliott, et al., 2022).

Although "gender reassignment" is a protected characteristic in the UK under the Equality Act (2010), it seems that we are currently moving away from societal acceptance. One recent UK report suggests there has been a 2000% increase in transphobic hate crime reported and prosecuted in the last 20 years (Metropolitan Police, 2022). It appears that trans and non-binary people face ongoing discrimination while their identities are subjected to inflammatory debate within traditional and social media.

Gender-affirming medical interventions are an obvious way to ameliorate gender dysphoria(Arellano-Anderson & Keuroghlian, 2020). However, waiting times for gender identity clinic assessments are typically very long (NHS, 2022), which means that trans and non-binary people may live with gender dysphoria for extended periods of time.

Our study also highlights areas for future research. Further qualitative exploration of drinking motives would identify specific aspects of drinking to cope that are most relevant for this population, as well as the social drinking motives that are associated with harms.

It is important to consider the positive role of alcohol for trans and non-binary communities, alongside the more negative associations with discrimination and coping. Bars and clubs often provide safe social spaces where people feel supported (Ireland, 2019). Such social support can lead to resilience in the face of minority stressors, and greater overall wellbeing (Meyer, 2015). Thus, including a measure of perceived social support would be beneficial. Alternative, healthier pastimes may be able to replace the feelings of pleasure and sociability gained from drinking alcohol. For example, other research, which included trans participants, has highlighted the

need for alcohol free safe spaces (Dimova, O'Brien, Elliott, et al., 2022). There is also a further need to explore the possible positive and negative aspects of drinking to have sex.

Strengths and limitations

An important strength of this research was the collaborative work with the trans and non-binary community. However, the sample was predominantly white. Previous research on the intersection of gender and ethnicity suggests this is an important factor (Malta et al., 2020). The cross-sectional nature of this research means that we cannot infer causality. Discrimination over time may be important, but within a study of daily surveys over 30 days discrimination was associated with increased odds of drug use on a given day (Wolford-Clevenger et al., 2021).

There are also limitations relating to other measures. For example, the item regarding drinking to have sex could be interpreted by the participants as either for positive (enhancing sexual experience) or negative (coping with aspects of the encounter) reasons. There was a considerable amount of missing data for age. This is a significant limitation because age is often associated with alcohol consumption. We have dealt with missing data using pairwise deletion, assuming data is missing completely at random. While this may result in bias (Bennett, 2001), observing the patterns in the data set it seems that where a participant is missing one item in a scale is more likely to be due to carelessness. Furthermore, the number of missing items were very small. For example, in the regression model predicting harms only nine cases were excluded for missing data.

With wide variation in responses to the gender identity question, some groups, such as those selecting both woman and genderqueer (N=7) were too small for meaningful comparison and five collapsed categories were used, based on recommendations from the community advisory group. However, this may ignore the unique experiences of specific groups. Larger purposive sampling of specific gender groups could address this issue.

Conclusions

Higher levels of reported discrimination were associated with higher AUDIT scores and more reported harms from drinking in this sample. The relationship between discrimination and alcohol consumption was mediated by coping motives and drinking to manage dysphoria. The relationship between discrimination and harms was mediated by coping motives, drinking to manage dysphoria and drinking to have sex. This cross-sectional study does not show a causal relationship between reported discrimination and alcohol dependence or harms. Both may depend on some shared characteristic such as personality or behaviour, or in some cases, alcohol consumption itself could lead to discrimination. However, the possibility that reported discrimination contributes to alcohol harms suggests that we should better understand ways to reduce discrimination against trans and non-binary communities. Furthermore, encouraging coping motives related to drinking are important to understand and if possible replaced with healthier coping strategies.

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TABLES AND FIGURES

Table 1: *Demographic characteristics of the sample – current drinkers only*

Demographic	**N**	**%**
Sample size	462	
Gender identity		
Non-binary and/or genderqueer	159	34.4
Woman (including trans woman)	135	29.2
Multiple gender identities	90	19.5
Man (including trans man)	63	13.6
Other gender identity	15	3.2
Sex at birth		
Female	224	48.5
Male	214	46.3
Prefer not to say	24	5.2
Ethnicity		
Asian/Asian British	7	1.5
Black/African/Caribbean/Black British	1	0.2
Latino	2	0.4
Mixed/Multiple ethnic groups	19	4.1
White	422	91.4
Other ethnic group	11	2.4
Sexual orientation		
Bisexual and/or Pansexual	117	25.3
Lesbian/Gay/Homosexual	44	9.5
Heterosexual	17	3.7

Asexual	18	3.9
Queer	50	10.8
Questioning	12	2.6
Other	9	1.9
Multiple sexual orientations - More than three sexual orientations selected or two selected and small N in group.	49	10.6
Lesbian/Gay/Homosexual + Queer	53	11.5
Bi/Pan + Queer	93	20.1

Table 2: *Study measures compared by gender groups.*

Mean (SD)	Non-Binary and/or Genderqueer	Woman only	Multiple identities	Man only	Other identity	p
AUDIT score	10.91 (7.31)[abc]	10.16 (7.22)[b]	8.87(6.81)[bc]	13.42 (9.10)[a]	8.20 (7.04)[abc]	**.003**
Social motives	14.92 (5.10)	14.50 (5.40)	13.76 (5.12)	15.90 (5.71)	12.87 (4.42)	.078
Coping motives	12.25 (5.10)	12.29 (5.35)	11.39 (5.19)	13.71 (5.96)	10.87 (6.10)	.093
Enhancement motives	13.31 (4.72)	12.50 (4.75)	11.71 (4.78)	14.13 (5.30)	11.71 (4.25)	.016
Conformity motives	7.65 (3.40)	7.04 (2.81)	7.47 (3.25)	7.43 (3.61)	7.14 (3.70)	.620
Discrimination	5.58 (3.17)[b]	7.10 (3.07)[a]	6.54 (3.11)[ab]	7.48 (3.26)[a]	7.73 (4.08)[ab]	**.000**
Harms	2.32 (2.47)	1.85 (2.27)	1.67 (1.99)	2.90 (2.59)	2.13 (2.70)	.011
Kessler 6	12.81 (5.25)	11.69 (5.61)	11.92 (5.19)	12.70 (6.12)	12.60 (4.39)	.424
Loneliness	6.90 (1.85)	6.91 (1.85)	6.59 (2.04)	6.89 (1.98)	6.73 (1.44)	.734
Congruence total	2.72 (0.61)[b]	3.11 (0.90)[a]	2.91 (0.73)[bd]	3.23 (0.90)[a]	2.32 (0.51)[bc]	**.000**
Appearance congruence	2.26 (0.69)[b]	2.74 (1.08)[ac]	2.50 (0.88)[bc]	2.99 (1.10)[a]	1.90 (0.63)[b]	**.000**
Gender identity congruence	4.09 (0.87)	4.25 (0.87)	4.15 (0.88)	3.95 (0.93)	3.58 (0.72)	.023
Drink to manage gender dysphoria	1.79 (1.13)	2.12 (1.32)	2.06 (1.28)	2.05 (1.43)	1.53 (1.06)	.115
Drink to have sex	1.52 (0.87)	1.32 (0.80)	1.28 (0.65)	1.41 (0.85)	1.67 (1.18)	.079

Note: different superscript letters denote groups that are significantly different when p <.004. Alpha level was adjusted to account for multiple comparisons (0.05/14 = .004).

Table 3: *Means, standard deviations and correlations between all study measures for the sample*

Measure	Mean (SD)	2	3	4	5	6	7	8	9.	10.	11.	12.
1. AUDIT	10.55 (7.55)	.248**	.645**	.469**	.086	.221**	.704**	.282**	.234**	-.130**	.528**	.267**
2. Social motives	14.64(5.29)		.375**	.543**	.380**	.105	.361**	.206**	.082	-.039	.153**	.204**
3. Coping motives	12.24 (5.36)			.473**	.224**	.241**	.527**	.476**	.293**	-.193**	.631**	.294**
4. Enhancement motives	12.82 (4.86)				.149**	.047	.386**	.190**	.132**	-.087	.254**	.191**
5. Conformity motives	7.39 (3.25)					.076	.192**	.230**	.227**	-.100*	.206**	.136**
6. Discrimination	6.54 (3.25)						.259**	.268**	.131**	.043	.308**	.154**
7. Harms	2.13 (2.37)							.366**	.244**	-.110**	.427**	.399**
8. Kessler 6	12.29 (5.45)								.500**	-.319**	.369**	.173**
9. Loneliness	6.84 (1.89)									-.295**	.225**	.079
10. Congruence	2.93 (0.80)										-.279**	-.035
11. Drink to cope with gender dysphoria	1.97 (1.27)											.230**
12. Drink to have sex	1.40 (0.82)											

Note: * = p<.05; ** = p<.01

Table 4: Correlations between outcome measures and predictors by gender group

	Social motives	Coping motives	Enhanc-ement motives	Conformi-ty motives	Discrimi-nation	Harms	Kessler 6	Lonelines s	Congrue-nce	Drink to cope with gender dysphoria	Drink to have sex
Non-binary and/or genderqueer											
AUDIT	.277**	.577**	.471**	.087	.031	.701**	.205**	.218**	-.047	.475**	.267**
Harms	.372**	.411**	.382**	.195*	.128	-	.278**	.260**	.055	.314**	.375**
Woman only											
AUDIT	.166	.604**	.458**	.083	.282**	.669**	.335**	.238**	-.138	.497**	.237**
Harms	.241**	.494**	.277**	.232**	.434**	-	.408**	.240**	-.066	.521**	.442**
Multiple IDs											
AUDIT	.330**	.618**	.496**	.188	.273**	.626**	.149	.164	-.259*	.561**	.187
Harms	.485**	.629**	.531**	.204	.140	-	.259*	.231*	-.269*	.468**	.227*
Man only											
AUDIT	.108	.790**	.341**	.003	.513**	.793**	.418**	.309*	-.238	.684**	.309*
Harms	.347**	.706**	.321*	.106	.539**	-	.504**	.218	-.298*	.541**	.448**
Other ID											
AUDIT	.563*	.836**	.715**	-.037	.136	.743**	.433	.358	-.528*	.769**	.578*
Harms	.499	.518*	.533*	.184	.023	-	.657**	.323	-.689**	.573*	.556*

Note: ** = p<.01; * = p<.05

Table 5: Regression models predicting AUDIT score and harms

AUDIT score	*β*	*t*	*p*
Constant		-3.06	.002
Social motives	-.058	-1.31	.191
Coping motives	.407	7.93	**.000**
Enhancement motives	.265	6.09	**.000**
Conformity motives	-.083	-2.20	.028
Discrimination	.061	1.66	.098
Kessler 6	-.059	-1.34	.180
Loneliness	.086	2.16	.031
Congruence	.034	.91	.362
Drink to cope with gender dysphoria	.202	4.35	**.000**
Drink to have sex	.065	1.84	.066
Harms	*Exp (B)*	*95% CI for Exp (B)*	*p*
Intercept	0.096	0.041-0.227	.000
Social motives	1.042	1.013-1.073	**.005***
Coping motives	1.047	1.013-1.083	.007
Enhancement motives	1.040	1.008-1.073	.015
Conformity motives	0.976	0.936-1.018	.254
Discrimination	1.030	0.989-1.072	.151
Kessler 6	1.027	0.998-1.059	.072
Loneliness	1.039	0.963-1.121	.323
Congruence	1.042	0.883-1.231	.625
Drink to cope with gender dysphoria	1.088	0.963-1.231	.177
Drink to have sex	1.213	1.055-1.305	.007

Note: p values in bold considered significant predictors; alpha value set to .005 adjusted to account for multiple comparisons (0.05/10 = .005). *This p value is .0045 to four decimal places.

Table 6. *Bootstrapped standardised indirect effects for multiple mediation model to test whether drinking motives mediate the relationship between discrimination and AUDIT*

	Effect	95% CI [a]
Total	.1649	.0951, .2320
Social motives	-.0073	-.204, .0024
Coping motives	**.0960**	**.0515, .1456***
Enhancement motives	.0095	-.0165, .0361
Conformity motives	-.0047	-.0158, .0015
Drink to cope with dysphoria	**.0617**	**.0257, .1026***
Drink to have sex	.0097	-.0002, .0254

Notes: [a] = bootstrapping confidence intervals based on 5,000 samples * significant mediation effect.

In a single mediator model, social motives significantly mediated the relationship between discrimination and AUDIT score (standardised indirect effect = .0242 bootstrapped 95% CI = .0021, .0512

In this paper, we use terms 'trans' and 'non-binary' to describe anyone whose gender identity does not align with the sex registered at birth. We acknowledge that there is variation in who is considered to fall under the 'trans' umbrella. For the purposes of this research, the terms 'trans' and 'non-binary' encompasses trans men, trans women as well as non-binary, genderqueer and other gender non-conforming people. Cisgender (cis) is a term used to describe people whose gender identity corresponds with sex registered at birth (Vincent, 2018).

Box 1: Explanation of the terms trans and non-binary as used in this paper.

Supplementary Materials

Table S1. *Items on the drinking motives scale by gender group*

	NB and Genderqueer		Woman only		Multiple IDs		Man only		Other ID	
Drinking motives scale items	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
To forget your worries (cope)	2.23	1.165	2.28	1.302	2.02	1.112	2.65	1.393	1.93	1.387
Because your friends pressure you to drink (conf)	1.32	0.64	1.3	0.683	1.28	0.561	1.27	0.545	1.2	0.414
Because it helps you enjoy a party (soc)	2.98	1.219	2.87	1.395	2.6	1.288	3.35	1.405	2.47	1.246
Because it helps you when you feel depressed or nervous (cope)	2.59	1.323	2.64	1.319	2.46	1.431	2.79	1.393	2.4	1.454
To be sociable (soc)	3.21	1.29	3.02	1.231	3.04	1.315	3.44	1.377	2.6	1.298
To cheer up when you are in a bad mood (cope)	2.13	1.189	2.2	1.251	2	1.209	2.44	1.479	1.93	1.335
Because you like the feeling (enh)	3.08	1.321	3.03	1.287	2.71	1.318	3.22	1.497	2.87	1.356
So that others won't kid you about not drinking (conf)	1.28	0.772	1.17	0.567	1.26	0.628	1.24	0.712	1.43	0.756
Because it's exciting (enh)	1.95	1.179	1.57	1.026	1.76	1.063	2.3	1.328	1.27	0.799
To get high (enh)	2.06	1.286	1.92	1.333	1.88	1.253	2.29	1.507	1.87	1.246
Because it makes social gatherings more fun (soc)	3.03	1.287	2.86	1.247	2.74	1.32	3.19	1.469	2.53	1.125
To fit in with a group you like (conf)	1.75	1.111	1.62	1.036	1.67	0.994	1.71	1.237	1.6	0.986
Because it gives you a pleasant feeling (enh)	3.12	1.239	3.1	1.289	2.66	1.359	3.11	1.438	3	1.301
Because it improves parties and celebrations (soc)	2.89	1.26	2.76	1.307	2.57	1.35	3.08	1.527	2.47	1.356
Because you feel more self-confident and sure of yourself (cope)	3.08	1.396	2.81	1.452	2.67	1.349	3.16	1.537	2.53	1.552

To celebrate a special occasion with friends (soc)	2.82	1.167	2.99	1.172	2.8	1.153	2.84	1.081	2.8	1.082
To forget about your problems (cope)	2.21	1.314	2.36	1.458	2.24	1.36	2.63	1.56	2.07	1.624
Because it's fun (enh)	3.1	1.254	2.88	1.246	2.71	1.274	3.21	1.322	2.6	1.404
To be liked (conf)	1.57	0.997	1.39	0.802	1.51	0.974	1.57	0.995	1.4	0.737
So you won't feel left out (conf)	1.71	0.996	1.56	0.912	1.76	0.998	1.63	1.005	1.6	1.183
To manage your gender dysphoria (added)	1.79	1.131	2.12	1.322	2.06	1.284	2.05	1.43	1.53	1.06
To have sex (added).	1.52	0.87	1.32	0.798	1.28	0.654	1.41	0.854	1.67	1.175

Notes: conf = conformity motives, soc = social motives, enh = enhancement motives, cope = coping motives, added = included as suggested by community advisory group.

S2. Example promotional materials


T+NB
ALCOHOL
SURVEY
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Sex, drugs & wellbeing

Drug use among UK trans people

With Dr. Matt Hibbert
&
Dr. Dean Connolly

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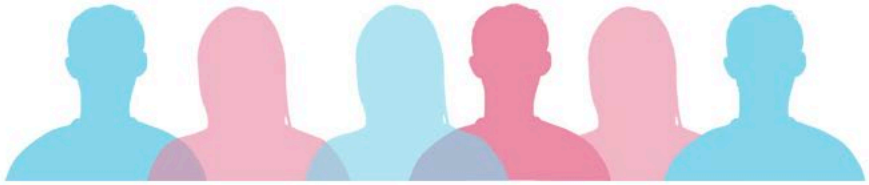

drugs and me

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Drugs and sexual violence

Rethinking prevention

Supplementary Figure 2: ***Comparison of discrimination experiences by category***