



Research paper

Gender identity and expression in relation to depression and anxiety in racial and ethnic minority youth: Evaluations of intersectionality in a population-based study

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ABSTRACT

Introduction: Transgender and gender non-conforming (TGNC) youth experience higher rates of depression and anxiety. Risk for these outcomes in racial and ethnic minority populations remains unclear. This study aimed to examine disparities in depression and anxiety at the intersection of race and ethnicity and TGNC status in a population-based sample.

Methods: Data were from the 2019 Minnesota Student Survey. Students ($n = 119,648$) completed questions about their race, ethnicity, gender identity and expression, depression, and anxiety.

Results: Within racial and ethnic groups, TGNC youth generally had greater risk for depression and anxiety. Significant associations for gender minority identity ranged from $OR_{\text{Depression}} = 2.25$ for Black youth who do not identify as male to $OR_{\text{Depression}} = 5.08$ for non-minority ethnicity youth who do not identify as female. For perceived gender expression in cisgender youth, significant associations ranged from $OR_{\text{Depression}} = 1.17$ for Black youth assigned female at birth and $OR_{\text{Anxiety}} = 1.17$ for other-minority ethnicity youth assigned female at birth to $OR_{\text{Depression}} = 1.46$ for non-minority ethnicity youth assigned female at birth and $OR_{\text{Anxiety}} = 1.46$ for American Indian/Alaskan Native youth assigned male at birth. Within-TGNC-youth comparisons yielded a few racial/ethnic differences relative to White peers. Significant differences ranged from $OR_{\text{Anxiety}} = 0.53$ to $OR_{\text{Anxiety}} = 1.41$ for cisgender females.

Limitations: The cross-sectional data limits our ability to test causation.

Conclusions: Multiple-minority youth were not universally at increased risk for depression and anxiety, indicating an intersectional framework is important for understanding risk for these outcomes in TGNC youth. Future research identifying potential risk and protective factors is needed to advance screening and treatment strategies for multiple-minority TGNC youth populations.

1. Introduction

Transgender and gender non-conforming (TGNC) individuals include gender minority individuals (i.e., individuals who do not identify with the sex that they were assigned at birth) and gender non-conforming individuals (i.e., those whose outward appearance and behaviors do not align with their sex assigned at birth; Rider et al., 2018). TGNC populations are understudied in health outcome research despite evidence that TGNC youth are at increased risk for negative mental health

outcomes (Moradi and Grzanka, 2017). For example, several studies have found that gender minority youth are at higher risk for a variety of negative health outcomes, particularly depression and anxiety, compared to cisgender youth (Guz et al., 2021; Pattison et al., 2021; Poteat et al., 2021; Price-Feeney et al., 2020).

Within TGNC populations, those perceived as gender non-conforming are particularly understudied even though it reflects the experiences of a greater proportion of the general population (Tabler et al., 2021). Gender non-conforming youth are those who not conform

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to stereotypical expectations in their gender expression, a group that may include cisgender youth (Rider et al., 2018; Roberts et al., 2013). In the few studies that have looked at gender expression in relation to negative health outcomes, perceived gender non-conformity was positively associated with depression and other negative health outcomes (Rider et al., 2018; Roberts et al., 2013; Tabler et al., 2021).

A topic even less studied, and the importance of which has received growing recognition, is intersectionality between marginalized identities, including TGNC and racial and ethnic minority identities. Part of this importance lies in the fact that, as with TGNC populations, marginalized racial and ethnic populations have been historically understudied in the empirical literature (Adams and Miller, 2021; Coulter et al., 2014; Doãn et al., 2019; Institute of Medicine, 2011; Robertson et al., 2021). Moreover, intersectionality may be a promising perspective to understand experiences of marginalized racial and ethnic TGNC youth. With intersectionality frameworks (Bostwick et al., 2014; Crenshaw, 1995), it is important to account for the different social categories that make up an individual's identity and experiences in understanding health outcomes. Specifically, risk for health outcomes, such as depression and anxiety, may differ depending on unique intersections of gender and race/ethnicity. Contrastingly, double jeopardy (Ferraro and Farmer, 1996) is the concept that individuals with multiple minority identities are increased risk for mental health outcomes regardless of the specific identities an individual holds (Moradi et al., 2010). Empirical evaluations are needed to evaluate these competing perspectives in TGNC individuals across multiple racial and ethnic identities.

Furthermore, in studies that have assessed racial and ethnic differences in depression and anxiety relative to non-Hispanic White youth, higher rates of depression and anxiety have been found for Hispanic youth (López et al., 2016; McLaughlin et al., 2007), whereas Black youth may be at increased risk for anxiety and decreased risk for depression (McLaughlin et al., 2007; Mojtabai et al., 2016). Therefore, risk for these outcomes may differ across different racial and ethnic identities in TGNC youth. Clarity on the intersection of TGNC identities and racial/ethnic identities is needed for its potential to inform the development of culturally sensitive and person-centered approaches to mental health treatments.

To date, few studies have assessed mental health outcomes in youth at the intersection of gender and race beyond White versus Black or non-White dichotomies. Aggregation of disparate minority populations, however, risks masking important differences between them (Lett et al., 2020). Fox et al. (2020) examined depression in White, Black, Asian, and Latinx gender minority youth. They found that Black gender minority youth reported less depression compared to White gender minority youth. Another study demonstrated that biracial/multiracial sexual and gender minority (SGM) youth reported more depressive symptoms than Asian and other Pacific Island SGM youth (Mereish et al., 2022).

Several notable gaps in the literature remain to be addressed. First, although these aforementioned studies are important for advancing the assessment of intersectionality in the context of depression and anxiety in TGNC youth with a broader array of racial groups, other important racial populations remain unexamined (e.g., American Indian/Alaskan Native). American Indian/Alaskan Native communities are especially relevant here, as they are one of the few racial groups to have higher rates of depression than non-Hispanic Whites in an epidemiological study (Hasin et al., 2005).

Second, given the challenges to feasibility in recruiting sufficiently large samples of TGNC individuals to study mental health outcomes, researchers often use sampling strategies directly targeting TGNC individuals (e.g., snowball recruitment strategies, advertisements to TGNC

communities on social media, or gender clinics; Dickey et al., 2015; Fox et al., 2020). These challenges are increased considerably when it comes to studying intersectionality with racial and ethnic minority identities, all while preserving distinctions between minority identities. These recruitment methods may lead to sampling biases, artificially increasing or decreasing risk estimates, resulting in findings of limited generalizability to the general community (McElroy et al., 2016). For example, community connectedness, such as belonging to a gender minority support group, is a protective factor in TGNC individuals, (Hendricks and Testa, 2012; Lefevor et al., 2019; Meyer, 2015) potentially leading to underestimates of risk when recruiting from SGM community organizations. Worth noting within this context is that this concern about such sampling strategies leading to different estimates of risk is relevant to studies of sexual minority populations, for which support of this concern has been found in a recent meta-analysis (Hottes et al., 2016). In fact, this meta-analysis found that the prevalence for certain mental health outcomes differed by almost 10 % between general population recruitment and sexual minority-targeted recruitment. Although this was specifically about sexual minority populations, it is reasonable to suspect this concern would be equally applicable to TGNC populations. This suggests that despite challenges to feasibility, studies at the general population level are necessary for accurately characterizing mental health concerns in TGNC individuals.

Finally, depression and anxiety often have their first emergence in adolescence or earlier, and experiences of anxiety and depression at this age are associated with a worse prognosis in adulthood (Alpert et al., 1999; Kessler et al., 2005; Ramsawh et al., 2011). However, to date, studies in this area with TGNC individuals have focused primarily on adults. Although studies with TGNC adults are important, their findings cannot be generalized to TGNC youth. TGNC adolescents have developmentally unique experiences, such as increased experiences of bullying and distress due to pubertal changes happening that do not align with their gender (Grossman and D'Augelli, 2007).

The current study aimed to address these gaps in the literature by examining intersectionality between TGNC and race and ethnicity among youth in terms of depression and anxiety. It does so by uniquely leveraging a large population-based sample of youth that permitted analyses maintaining distinctions between five racial and three ethnic groups in primary analyses. We first assessed for the presence of disparities in depression and anxiety among TGNC youth versus non-TGNC youth within race and ethnicity. We hypothesized that gender minority youth will have more depression and anxiety than cisgender youth of the same race or ethnicity. We similarly hypothesized that youth perceived as gender non-conforming will have more depression and anxiety compared to youth perceived as conforming of the same race or ethnicity. Given that risk for depression and anxiety may differ depending on unique intersections of gender and race/ethnicity, and given the mixed findings from the modest body of literature to date on the intersection between TGNC and race and ethnicity for depression and anxiety, we also conducted exploratory analyses evaluating whether there are specific racial and ethnic minority TGNC youth with greater depression and anxiety than White and non-minority ethnicity TGNC youth.

2. Methods

2.1. Study sample and procedures

The Minnesota Student Survey (MSS) is a population-based survey administered to public school students every three years by the Minnesota Department of Education, Health, Human Services, and Public

Safety. Students answered questions anonymously about their physical and mental health, risk behaviors, and protective factors. Increased openness in reporting sensitive behaviors has been shown in adolescents when anonymous methods are used (Turner et al., 1998). The current study was based on the 2019 survey, the most recent year for which data are available. Students available for the study were in grades 8, 9, and 11. All public school districts in Minnesota were invited to participate in the study; 81 % of districts agreed to participate.

2.2. Measures

2.2.1. Sociodemographic variables

For race and Hispanic ethnicity, all participants were asked “How do you describe yourself? (Mark ALL that apply).” The response options included “American Indian or Alaskan Native,” “Asian or Asian American,” “Black, African, or African American,” “Hispanic or Latino/a,” “Native Hawaiian or other Pacific Islander,¹” and “White.” Youth who selected more than one race were classified as multiracial. Hispanic was classified as an ethnicity, which meant that youth who self-identified as Hispanic and any one of the races (e.g., White) were not coded as multiracial. Among racial minority youth, those who identified as American Indian/Alaskan Native, Asian/Asian American, or Black/African/African American were subsequently asked which ethnic group best describes them and were presented with a list of options specific to their race.² Ethnicities included in study analyses were: Hispanic, other-minority ethnicity³ (i.e., all youth who identified as an ethnic minority other than Hispanic), and non-minority ethnicity (i.e., non-Hispanic White). As a proxy for socioeconomic status (SES), students were asked “Do you currently get free or reduced-price lunch at school?” Free or reduced lunch has been accepted as a valid indicator of SES (Nicholson et al., 2014) and widely used in previous research (Baams, 2018; Barnes et al., 2010; Walsh et al., 2021).

2.2.2. Gender identity and perceived gender expression

In line with the Williams Institute recommended guidelines (The GenIUSS Group, 2014), the MSS adopted a two-step approach to assess gender identity. Participants were first asked their sex assigned at birth followed by a question about their current gender identity: “Are you transgender, genderqueer, or genderfluid?” Response options were “Yes,” “No,” “I am not sure about my gender identity,” and “I am not sure what this question means.” To create a gender minority identity variable for analyses, participants who responded that they were not sure about their gender identity were combined with participants who positively endorsed the question. This was in line with past studies (Eisenberg et al., 2019; Rider et al., 2018; Salk et al., 2020) and studies have demonstrated that youth who identify as a gender minority and are unsure about their gender identity have similar outcomes of health and social well-being (Bower-Brown et al., 2021; Clark et al., 2014). Participants who responded that they did not understand the question were excluded from all analyses.

Participants in grades 9 and 11 were also asked about their perceived gender expression with the question: “A person’s appearance, style, dress

¹ Native Hawaiians and other Pacific Islanders were not included in the analyses with race variables, given that the subsample was too small for conducting analyses of intersectionality with TGNC youth. This is consistent with expectations based on US Census data for Minnesota, according to which 0.7 % of individuals in the state identified as Native Hawaiian or other Pacific Islander in 2019 (US Department of Health and Human Services et al., 2021).

² For example, Asian youth were only asked about Asian ethnicities, such as Hmong, Korean, Lao, etc. Similarly, Black youth were only asked about Black/African/African American ethnicities, such as Ethiopian, Liberian, Nigerian, etc. Asian youth were not asked about Black ethnicities and vice versa.

³ This is based on what is considered a minority in the US (e.g., Nigerian would be considered an ethnic minority in the US but not in Nigeria).

or the way they walk or talk may affect how people describe them. How do you think other people at school would describe you?” which merges 2 items that have been validated with similar populations (Wylie et al., 2010). Response options included “very or mostly feminine,” “somewhat feminine,” “equally feminine and masculine,” “somewhat masculine,” and “very or mostly masculine.” Responses were scored on a scale from 1 to 5, with higher values reflecting greater perceived gender non-conformity.

2.2.3. Depression and anxiety

The outcomes were current depressive symptoms and anxiety symptoms, assessed using the Patient Health Questionnaire 2-item (PHQ-2) and Generalized Anxiety Disorder 2-item (GAD-2; Kroenke et al., 2003, 2007) respectively. The PHQ-2 and GAD-2 are each two-item self-report measures with three-point Likert scales with summed scores ranging from 0 to 6. These measures each have a clinical cut off of three based on their summed scores and have been widely used and validated in studies of depression and anxiety, respectively (Hughes et al., 2019; Kroenke et al., 2003; Plummer et al., 2016; Richardson et al., 2010).

2.3. Data analysis

To evaluate gender minority status in relation to depression and anxiety within each racial and ethnic group, a series of multivariate logistic regression analyses was conducted with depression and anxiety, respectively, as the criterion variable and gender as the predictor variable. Analyses were stratified by race and ethnicity, such that gender minority youth were compared to non-gender minority youth of the same race or ethnicity.

To evaluate perceived gender expression in relation to depression and anxiety within each racial and ethnic group, these analyses were repeated with perceived gender expression (treated as a continuous variable) in place of gender minority status as the predictor variable. Analyses of perceived gender expression were restricted to cisgender youth to provide stringent evaluations of depression and anxiety in TGNC individuals who did not self-identify as gender minority individuals.

Next, to assess whether racial and ethnic minority status predicted depression and anxiety within gender minority youth, a set of multivariate logistic regressions were conducted with depression and anxiety, respectively, as the criterion variable and race and ethnicity, respectively, as the predictor variable. This set of analyses was restricted to youth of gender minority identity, with each minority race compared to White race, and with each minority ethnicity (i.e., Hispanic, other-minority ethnicity youth) compared to non-minority ethnicity.

Finally, to evaluate whether racial and ethnic minority status predicted depression and anxiety within cisgender youth perceived as gender non-conforming, these analyses were repeated within cisgender non-conforming youth instead of gender minority youth. For these analyses, it was necessary to treat perceived gender expression as a categorical variable. The categorical variable was created by combining all cisgender youth who responded with any response other than “very or mostly” about their perceived gender.

All analyses were stratified by sex assigned at birth. Age and the SES proxy were covaried in all analyses. Multi-level analyses accounting for school or school district were not possible as these data were not available. Standard regression analyses were therefore applied, following the precedence of prior studies with MSS data (Eisenberg and Resnick, 2006; Taliaferro et al., 2018).

Table 1
Sample descriptives for full study sample, gender minority youth, and non-gender minority youth.

Variables ^a	Full sample (N = 119,648)	Gender minority youth (n = 3861)	Non-gender minority youth (n = 115,787)
Race^b			
White	85,394 (76.42 %)	2524 (70.58 %)	82, 870 (76.61 %)
American Indian/Alaskan Native	1567 (1.40 %)	85 (2.38 %)	1482 (1.37 %)
Asian	7838 (7.01 %)	276 (7.72 %)	7562 (6.99 %)
Black	9348 (8.37 %)	272 (7.61 %)	9, 076 (8.39 %)
Native Hawaiian/Other Pacific Islander ^c	264 (0.24 %)	23 (0.64 %)	241 (0.22 %)
Multi-racial	7335 (6.56 %)	396 (11.07 %)	6939 (6.41 %)
Ethnicity			
Non-minority ethnicity	82,937 (69.75 %)	2432 (63.95 %)	80, 505 (69.95 %)
Hispanic	10,935 (9.20 %)	414 (10.89 %)	10,521 (9.14 %)
Other-minority ethnicity	25, 027 (21.05 %)	957 (25.16 %)	24, 070 (20.91 %)
Sex assigned at birth			
Female	60,625 (50.74 %)	2616 (68.88 %)	58,009 (50.15 %)
Male	58,854 (49.26 %)	1182 (31.12 %)	57,672 (49.85 %)
Gender minority identity			
Perceived Gender Expression, m (SD) ^d	3861 (3.23 %)	3, 861 (100 %)	0 (0 %)
Age, m (SD)	–	–	1.67 (0.84)
Use of free or reduced lunch	14.83 (1.31)	14.73 (1.30)	14.83 (1.31)
Depression (Patient Health Questionnaire-2), m (SD)	27, 293 (26.13 %)	1130 (36.51 %)	26,163 (25.81 %)
Anxiety (Generalized Anxiety Disorder-2), m (SD)	1.48 (1.71)	3.00 (2.05)	1.43 (1.67)
	1.72 (1.93)	3.29 (2.18)	1.67 (1.90)

^a Some sections do not equal the full sample due to missing data across some variables.

^b The sum of the race percentages for the non-gender minority subsample equals below 100 % due to rounding.

^c Native Hawaiian/other pacific islander youth were not included in the race stratified analyses as there were not enough participants.

^d Perceived gender expression cells are blank for the full sample and gender minority youth sample as perceived gender expression analyses were only conducted for non-gender minority youth.

3. Results

3.1. Sample descriptives

A total of 119,648 participants were included in this study.⁴ For analyses of cisgender participants who answered questions about perceived gender expression (i.e., those in grades 9 and 11), 73,119 participants provided data. Descriptive statistics are based on the full study sample. A total of 3.23 % of participants endorsed a gender minority identity, and 47.49 % of cisgender youth positively endorsed at least some degree of perceived non-conforming gender expression. The mean age of the full sample was 14.83 (SD = 1.31), and 50.74 % were assigned female sex at birth. In terms of racial composition of the full study sample, 76.60 % identified as White, 1.41 % American Indian or Alaskan Native, 7.03 % Asian, 8.39 % Black, and 6.58 % multi-racial.⁵ In terms of ethnicity, 9.20 % of participants identified as Hispanic, 21.05 % other-minority ethnicity, and 69.75 % non-minority ethnicity. For full sample details, see Table 1.

⁴ This total was after excluding the 4.11 % of adolescents who did not understand the gender identity question. In descriptive analyses comparing those who understood the gender identity question to those who did not, we found that all racial and ethnic minority groups were more likely to not understand the question (American Indian/Alaskan Native $\chi^2 = 42.74, p < 0.001$; Asian $\chi^2 = 81.93, p < 0.001$; Black $\chi^2 = 115.40, p < 0.001$; Native Hawaiian/Other Pacific Islander $\chi^2 = 20.49, p < 0.001$ and Hispanic $\chi^2 = 58.27, p < 0.001$) except for multi-racial for which there were no group differences ($\chi^2 = 1.48, p = 0.22$). In contrast, White adolescents were more likely to understand the gender identity question ($\chi^2 = 359.53, p < 0.001$). In terms of other demographics, females ($\chi^2 = 409.16, p < 0.001$) and older adolescents ($t = 16.83, p < 0.001$) were more likely to understand the question. In terms of clinical outcomes, anxious adolescents ($\chi^2 = 20.67, p < 0.001$) were more likely to understand the question and depressed adolescents ($\chi^2 = 3.14, p < 0.001$) were less likely to understand the question.

⁵ The sum of individual race percentages for the full sample exceeds 100 % due to rounding.

3.2. Comparisons of TGNC and non-TGNC youth within race and ethnicity

Analyses of gender minority status in relation to depression and anxiety, respectively, stratified by sex, race, and ethnicity are presented in Table 2. Compared to cisgender youth of the same race and ethnicity, TGNC youth were more likely to experience depression and anxiety across all racial and ethnic identities (e.g., Asian TGNC youth were more likely to experience depression compared to Asian cisgender youth), except Black youth assigned male at birth in the case of anxiety. This pattern of findings was consistent regardless of sex assigned at birth.

In analyses of perceived gender expression in cisgender youth (Table 3), males perceived as gender non-conforming were more likely to experience depression and anxiety compared to males perceived as gender conforming for all racial and ethnic groups (e.g., multi-racial cisgender males perceived as gender non-conforming were more likely to experience depression compared to multi-racial cisgender males perceived as gender conforming), except American Indian and Alaskan Native in the case of depression. Females perceived as gender non-conforming were more likely to experience depression compared to females perceived as gender conforming for all racial and ethnic groups, except American Indian and Alaskan Native youth. Females perceived as gender non-conforming were more likely to experience anxiety compared to females perceived a gender conforming for all racial and ethnic groups, except in American Indian and Alaskan Native, Asian, and multi-racial youth.

3.3. Comparisons of racial and ethnic identities among TGNC youth

Analyses of racial and ethnic minority status in relation to depression and anxiety, respectively, among TGNC youth are presented in Tables 4 and 5. Among gender minority youth, no findings were statistically significant when comparing racial minority youth and ethnic minority youth to White youth and non-minority ethnicity youth, respectively (Tables 4; e.g., American Indian and Alaskan Native gender minority youth were not more or less likely to experience depression or anxiety compared to White gender minority youth).

As for cisgender youth perceived as gender non-conforming, Hispanic females were more likely to experience both clinical outcomes

Table 2
Logistic regression analyses for depression and anxiety by gender identity status stratified by sex, race, and ethnicity.

Variables	Assigned Male at Birth				Assigned Female at Birth			
	Depression		Anxiety		Depression		Anxiety	
	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p
Race								
White	3.91 (3.26–4.70)	<0.001	3.80 (3.16–4.56)	<0.001	4.96 (4.43–5.55)	<0.001	4.00 (3.57–4.49)	<0.001
American Indian/Alaskan Native	3.48 (1.22–9.91)	<0.05	3.52 (1.24–10.00)	<0.05	2.61 (1.32–5.17)	<0.01	3.41 (1.62–7.16)	<0.01
Asian	2.33 (1.40–3.86)	<0.01	2.99 (1.81–4.94)	<0.001	2.72 (1.89–3.93)	<0.001	2.39 (1.66–3.43)	<0.001
Black	2.25 (1.18–4.29)	<0.05	2.01 (1.00–4.04) ^b	0.05	3.08 (1.97–4.83)	<0.001	3.38 (2.16–5.31)	<0.001
Multi-racial	3.07 (1.90–4.95)	<0.001	3.08 (1.91–4.94)	<0.001	3.09 (2.28–4.18)	<0.001	2.88 (2.12–3.92)	<0.001
Ethnicity								
Non-minority ethnicity	4.04 (3.36–4.87)	<0.001	3.89 (3.23–4.69)	<0.001	5.08 (4.54–5.70)	<0.001	4.09 (3.64–4.60)	<0.001
Hispanic	2.28 (1.42–3.66)	<0.001	2.50 (1.56–4.01)	<0.001	2.56 (1.92–3.42)	<0.001	2.99 (2.22–4.02)	<0.001
Other-minority ethnicity	2.88 (2.13–3.90)	<0.001	3.10 (2.28–4.21)	<0.001	3.15 (2.57–3.85)	<0.001	3.02 (2.47–3.70)	<0.001

Note: Use of free or reduced lunch and age were covaried in all analyses.

^a Compared with non-gender minority youth of the same race/ethnicity.

^b The lower end of the confidence interval was rounded up but did not exceed 1.00.

Table 3
Logistic regression analyses for depression and anxiety by gender expression stratified by sex, race, and ethnicity among cisgender youth.

Variables	Assigned male at birth				Assigned female at birth			
	Depression		Anxiety		Depression		Anxiety	
	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p
Race								
White	1.35 (1.30–1.41)	<0.001	1.34 (1.29–1.40)	<0.001	1.45 (1.40–1.51)	<0.001	1.27 (1.23–1.32)	<0.001
American Indian/Alaskan Native	1.20 (0.92–1.56)	0.17	1.46 (1.12–1.92)	<0.01	1.18 (0.93–1.51)	0.17	1.23 (0.97–1.55)	0.09
Asian	1.42 (1.25–1.61)	<0.001	1.43 (1.25–1.64)	<0.001	1.22 (1.08–1.38)	<0.01	1.10 (0.98–1.25)	0.10
Black	1.27 (1.13–1.43)	<0.001	1.25 (1.10–1.41)	<0.001	1.17 (1.04–1.31)	<0.01	1.19 (1.07–1.34)	<0.01
Multi-racial	1.24 (1.09–1.42)	<0.01	1.36 (1.19–1.56)	<0.001	1.23 (1.10–1.37)	<0.001	1.11 (1.00–1.23) ^b	0.06
Ethnicity								
Non-minority ethnicity	1.36 (1.30–1.41)	<0.001	1.35 (1.29–1.41)	<0.001	1.46 (1.41–1.52)	<0.001	1.28 (1.23–1.32)	<0.001
Hispanic	1.23 (1.10–1.37)	<0.001	1.23 (1.09–1.37)	<0.001	1.29 (1.17–1.42)	<0.001	1.26 (1.15–1.38)	<0.001
Other-minority ethnicity	1.31 (1.22–1.41)	<0.001	1.35 (1.26–1.46)	<0.001	1.22 (1.14–1.30)	<0.001	1.17 (1.10–1.24)	<0.001

Note: Use of free or reduced lunch and age were covaried in all analyses.

^a Compared with perceived gender-conforming cisgender youth birth of the same race/ethnicity.

^b The lower end of the confidence interval was rounded up but did not exceed 1.00.

Table 4
Logistic regression analyses for depression and anxiety by sex, race, and ethnicity among gender minority youth.

Variables	Assigned male at birth				Assigned female at birth			
	Depression		Anxiety		Depression		Anxiety	
	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p
Race								
White	1.00		1.00		1.00		1.00	
American Indian/Alaskan Native	2.13 (0.42–10.79)	0.36	2.35 (0.46–11.86)	0.30	1.41 (0.48–4.19)	0.53	2.79 (0.87–9.01)	0.09
Asian	1.33 (0.32–5.55)	0.69	1.66 (0.40–6.88)	0.48	0.87 (0.33–2.29)	0.78	1.04 (0.38–2.88)	0.94
Black	1.26 (0.30–5.27)	0.75	1.07 (0.26–4.45)	0.93	1.02 (0.39–2.68)	0.98	1.42 (0.51–3.94)	0.50
Multi-racial	2.24 (0.62–8.04)	0.22	2.10 (0.58–7.53)	0.26	1.65 (0.68–3.99)	0.27	2.17 (0.85–5.56)	0.10
Ethnicity								
Non-minority ethnicity	1.00		1.00		1.00		1.00	
Hispanic	0.60 (0.22–1.61)	0.31	0.61 (0.23–1.65)	0.33	0.87 (0.50–1.54)	0.64	0.83 (0.47–1.47)	0.52
Other-minority ethnicity	0.51 (0.13–1.96)	0.33	0.46 (0.12–1.75)	0.25	0.57 (0.23–1.43)	0.23	0.42 (0.16–1.10)	0.08

Note: Use of free or reduced lunch and age were covaried in all analyses.

^a Compared with White and non-minority ethnicity gender minority youth.

compared to non-minority ethnicity females, and Asian and Black females were less likely to experience anxiety compared to White females (Table 5). Findings among males perceived as gender non-conforming were not statistically significant.

4. Discussion

The current study assessed gender identity and perceived gender expression and racial and ethnic identity in relation to depression and

anxiety in youth. The study is notable for its comprehensive assessments of multiple racial, ethnic, and gender subgroups in evaluating intersectionality in a large population-based sample. To our knowledge, assessing this level of granularity at the intersection of TGNC status and race and ethnicity in relation to mental health outcomes has not been previously conducted. Furthermore, the focus in the current study on a large community population-based sample of youth avoids the risk of biased estimates in prior studies using specific sampling strategies for targeting these hard-to-reach minority populations making findings

Table 5
Logistic regression analyses for depression and anxiety by sex, race, and ethnicity among perceived gender non-conforming cisgender youth.

Variables	Assigned male at birth				Assigned female at birth			
	Depression		Anxiety		Depression		Anxiety	
	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p	OR (95 % CI) ^a	p
Race								
White	1.00		1.00		1.00		1.00	
American Indian/Alaskan Native	1.48 (0.82–2.69)	0.20	1.10 (0.58–2.09)	0.77	1.03 (0.66–1.61)	0.88	0.99 (0.64–1.53)	0.96
Asian	1.28 (0.74–2.21)	0.38	0.76 (0.42–1.39)	0.37	0.70 (0.46–1.05)	0.09	0.54 (0.36–0.81)	<0.01
Black	1.31 (0.75–2.28)	0.35	0.75 (0.41–1.38)	0.35	0.71 (0.46–1.07)	0.10	0.53 (0.35–0.80)	<0.01
Multi-racial	1.44 (0.85–2.42)	0.17	1.07 (0.60–1.89)	0.82	1.22 (0.82–1.80)	0.32	1.04 (0.70–1.53)	0.86
Ethnicity								
Non-minority ethnicity	1.00		1.00		1.00		1.00	
Hispanic	1.31 (0.99–1.74)	0.06	1.06 (0.79–1.42)	0.70	1.40 (1.12–1.75)	<0.01	1.41 (1.14–1.76)	<0.01
Other-minority ethnicity	0.91 (0.53–1.55)	0.72	1.16 (0.65–2.09)	0.61	1.12 (0.75–1.67)	0.59	1.20 (0.81–1.78)	0.37

Note: Use of free or reduced lunch and age were covaried in all analyses.

^a Compared with White and non-minority ethnicity perceived gender non-conforming cisgender youth.

more generalizable among youth.

Across racial and ethnic groups, TGNC status was largely associated with depression and anxiety, with observed effects falling mostly in the medium-to-large range (National Academies of Sciences Engineering and Medicine, 2018) for gender minority identity and more modest effect sizes for perceived gender non-conformity. Collectively, these findings suggest TGNC status, particularly when based on gender identity, is robustly associated with depression and anxiety. The current study thus extends past findings for these outcomes in gender minority youth (Connolly et al., 2016; Reisner et al., 2015, 2016; Rider et al., 2018), generalizing to gender non-conforming youth as well as to multiple races and ethnicities and multiple forms of gender. This extension is particularly notable given that 47.49 % cisgender youth experienced at least some degree of perceived gender non-conformity.

These findings are also largely consistent with a recent prior study examining intersectionality between gender minority status and race and ethnicity in adolescents, which similarly found largely no difference in depression among gender minority youth across race and ethnicity (Fox et al., 2020). The one exception is significantly lower depression in Black gender minority youth compared to White gender minority youth in this prior study, in contrast to the nonsignificant associations in the current study. This difference in Black gender minority youth may be a function of differences in how samples were recruited for these two studies (see Hottes et al., 2016). Whereas the earlier study recruited through Facebook and Instagram specifically targeting gender minority adolescents who listed interests in transgender topics (i.e., interest tags such as “genderqueer” and “transgender”), the current study drew on a population-based sample from middle and high schools and did not specifically target gender minority adolescents. Despite generally consistent significant findings for TGNC youth within race and ethnicity and mostly non-significant findings for racial and ethnic differences within TGNC youth, support was found for the importance of intersectionality, indicating that risk may differ depending on unique intersections of gender and race/ethnicity (Bostwick et al., 2014; Crenshaw, 1995). This is particularly clear in findings of significant effects in opposite directions for gender non-conforming cisgender youth assigned female at birth, for specific races and ethnicities relative to White and non-minority ethnicity. These findings also do not support the concept of “double jeopardy” (Ferraro and Farmer, 1996).

The study findings highlight the importance of screening for depression and anxiety not only among gender minority youth but also cisgender youth who are perceived as gender non-conforming. It is important that public policies, resources, and clinical treatment focus on each of these groups of youth to address their greater risk for depression and anxiety. School programs and personnel have the potential to serve as important resources for TGNC youth when it comes to improving access to care, sense of community, and bridging the gap between parents and their TGNC teens as possible preventive factors against

depression and anxiety.

Although findings from this study are notable, it is important to consider the differences that may exist when assessing mental health outcomes in youth from different communities and generalizability of the current findings should be interpreted with this consideration in mind. Data used in this study were drawn from a U.S. state with low structural stigma. That is, it has social policies that extend protections to transgender individuals and serves as a refuge for transgender individuals. Findings from this study of associations with depression and anxiety may be more pronounced in states with greater structural stigma in the form of social policies that target TGNC and racial and ethnic minority individuals. In a prior study finding that state-level policies that did not extend protections to sexual minority individuals were correlated with increased psychopathology in sexual minority individuals, Hatzenbuehler et al. (2009) discuss the importance of evaluating the impact of structural stigma on health outcomes in transgender individuals. More recently, studies have begun to evaluate this relationship. A study with transgender individuals found that for those who lived in states with social policies that did not extend protection to transgender individuals had greater experiences of hopelessness and reduced sense of belonging compared to individuals who did not live in such states or were not aware of these policies in their home state (Tebbe et al., 2022). These findings support the need to evaluate intersectionality between TGNC status and race and ethnicity in relation to depression and anxiety in other states, and to assess the degree to which structural stigma state policies may influence these outcomes in TGNC youth.

As for future directions, it would important be to examine potential mechanisms underlying observed associations with depression and anxiety in TGNC youth. The gender minority stress model (Breslow et al., 2015; Hendricks and Testa, 2012; Meyer, 2015) posits that TGNC individuals experience risk for negative health outcomes because of greater exposure to stress specifically related to their identity (e.g., experiences related to identity-based victimization). Indeed, a recent study has found that across races and ethnicities gender minority stress was generally associated with higher depression and anxiety symptoms among gender minority adolescents (Jardas et al., n.d.). Similarly, race-based stressors (Clark et al., 1999) may explain unique processes of risk within individual racial minority groups. Assessing minority-specific stressors, in addition to general stressors, at both the interpersonal and structural level, may help explain why differing risk for depression and anxiety exists among TGNC youth across multiple minoritized identities.

4.1. Limitations

Several limitations should be noted. Additionally, the current study featured cross-sectional analyses. Longitudinal studies are needed to

determine the temporal nature of depression and anxiety relative to TGNC status (e.g., symptom trajectories). They are also needed fully to evaluate the nature of potential mechanisms and depression and anxiety (e.g., gender minority stressors as proximal versus distal risk factors). Such knowledge is important for advancing our ability to identify and reduce risk in TGNC youth. Finally, the question of gender expression in this study was one of perceived expression instead of actual expression. Responses based on the perceived gender expression used in this study therefore may to some degree convey gender affirmation in addition to gender expression. Future studies are needed to evaluate the extent that current findings replicate with actual gender expression.

5. Conclusion

This study provided important novel findings in a large population-based sample of TGNC youth, illuminating the unique intersections of race and ethnicity and TGNC status. TGNC youth are at increased risk for depression and anxiety across most races and ethnicities. Although these findings generally held across multiple races and ethnicities, several exceptions were observed, reflecting the complexity of the intersection of race, ethnicities, and TGNC status, and thus the need for sensitive and nuanced considerations in optimally addressing risk for depression and anxiety in individual subpopulations.

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CRediT authorship contribution statement

Ms. Turnamian and Dr. Liu designed the study. Ms. Turnamian managed the literature searches and analyses. Ms. Turnamian wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Declaration of competing interest

Dr., Liu currently serves as a consultant to Relmada Therapeutics. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies or Relmada Therapeutics. Ms. Turnamian declares no conflicts of interest.

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