# Transgender Adolescent Suicide Behavior

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abstract

**OBJECTIVES:** Our primary objective was to examine prevalence rates of suicide behavior across 6 gender identity groups: female; male; transgender, male to female; transgender, female to male; transgender, not exclusively male or female; and questioning. Our secondary objective was to examine variability in the associations between key sociodemographic characteristics and suicide behavior across gender identity groups.

**METHODS:** Data from the Profiles of Student Life: Attitudes and Behaviors survey (*N* = 120 617 adolescents; ages 11–19 years) were used to achieve our objectives. Data were collected over a 36-month period: June 2012 to May 2015. A dichotomized self-reported lifetime suicide attempts (never versus ever) measure was used. Prevalence statistics were compared across gender identity groups, as were the associations between sociodemographic characteristics (ie, age, parents' highest level of education, urbanicity, sexual orientation, and race and/or ethnicity) and suicide behavior.

**RESULTS:** Nearly 14% of adolescents reported a previous suicide attempt; disparities by gender identity in suicide attempts were found. Female to male adolescents reported the highest rate of attempted suicide (50.8%), followed by adolescents who identified as not exclusively male or female (41.8%), male to female adolescents (29.9%), questioning adolescents (27.9%), female adolescents (17.6%), and male adolescents (9.8%). Identifying as nonheterosexual exacerbated the risk for all adolescents except for those who did not exclusively identify as male or female (ie, nonbinary). For transgender adolescents, no other sociodemographic characteristic was associated with suicide attempts.

**CONCLUSIONS:** Suicide prevention efforts can be enhanced by attending to variability within transgender populations, particularly the heightened risk for female to male and nonbinary transgender adolescents.

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Dr Toomey conceptualized and designed the study, conducted the initial analyses, drafted the initial manuscript, and reviewed and revised the manuscript; Dr Syvertsen conceptualized and designed the study and critically reviewed the manuscript for important intellectual content; Ms Shramko conducted a portion of the analyses and reviewed the manuscript for clarity; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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**WHAT'S KNOWN ON THIS SUBJECT:** Transgender adolescents disproportionately report higher suicide attempts compared with cisgender adolescents. To our knowledge, no other researchers have examined heterogeneity in reported suicide behavior among transgender adolescents using a large sample to compare rates across subgroups.

**WHAT THIS STUDY ADDS:** This research builds on emerging evidence of the health disparities transgender adolescents experience by examining subgroup differences in suicide behavior. Findings provide new directions for assessing risk and designing interventions that are tailored to meet the needs of transgender youth.

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Emerging research reveals that transgender individuals (those whose gender identity does not align with their sex assigned at birth) report suicide behaviors (ie, plans for suicide attempts or past attempts) at a higher rate than their cisgender peers (those whose gender identity aligns with their sex assigned at birth).[1–3] Data from the 2015 United States Youth Risk Behavior Survey reveal that 8.6% of adolescents report attempting suicide in the past year, and 14.6% report having made a plan to attempt suicide.[4] Comparatively, studies have revealed that nearly 25% to 30% of transgender adolescents report attempting suicide during their lifetimes.[5,6] Furthermore, findings from the 2008 National Transgender Discrimination Study revealed that 45% of 18- to 24-year-old transgender people had attempted suicide in their lifetimes.[7] Other studies revealed that 28% to 52% of transgender people have attempted suicide.[8–10] It is important to document this disparity between cisgender and transgender individuals; yet, data often mask the variable experiences of the multitude of gender identities that fall within the transgender umbrella (ie, male to female, female to male, and not exclusively male or female).[1,11]

The need to examine variability within transgender populations in health behaviors is widely recognized but rarely accomplished because of small sample sizes, imprecision, and inaccuracies in how gender is captured in survey research.[1,3,11] That said, existing research hints at the variation that exists within transgender identity groups. For example, community-based studies have revealed that female to different gender and female to male adolescents report higher rates of suicide ideation (ie, 73.9% and 62.5%, respectively) and previous suicide attempts (46.4% and 18.4%, respectively) compared with all other groups,[6] whereas researchers in other studies find no differences.[12] Similarly, studies of transgender adults reveal that transgender men (ie, female to male) report higher levels of suicide behavior compared with transgender women (ie, male to female).[13,14] The sampling strategies used in these studies often limit analyses or generalizable conclusions about subpopulations' relative levels of risk. Notably, 1 retrospective study of electronic health records[2] revealed that there are no differences in suicide ideation or attempts between male to female (32.4% and 20.3%, respectively) and female to male (30.2% and 15.1%, respectively) transgender late adolescents and young adults. This sample was, however, limited to individuals who obtained care at a single, urban community health center,[2] limiting the generalizability of results.

Our purpose in this study was to examine subgroup differences in self-reported lifetime suicide behavior among transgender adolescents, adjusting for relevant sociodemographic characteristics. To achieve this goal, we conducted a secondary analysis of an existing, large data set to (1) examine differences in suicide attempts across 6 gender identity groups of adolescents (ie, female; male; transgender, male to female; transgender, female to male; transgender, not exclusively male or female; and questioning) and (2) identify key demographic characteristics that are associated with risk within and across gender identity subpopulations.

## METHODS

We conducted a secondary data analysis of the Profiles of Student Life: Attitudes and Behaviors survey, which was collected by the Search Institute via community partnerships. The survey includes 160 self-report items that are used to assess US adolescents' (age 11–19 years) developmental opportunities, relationships, values, skills, and wellbeing. Data were independently collected by public middle and high schools in the United States by organizations and community coalitions that approached Search Institute. Search Institute provides support and detailed administration guides to support survey administration but has limited oversight over the data collection process. Detailed information about the survey and methodology is available on the Search Institute's Web site.[15]

Study data were collected between June 1, 2012 (when a gender identity question that was inclusive of transgender adolescents was added to the survey), and May 31, 2015. The end date was selected to avoid confounding the analyses with any potential historical effect of the landmark 2015 Obergefell v Hodges US Supreme Court decision on same-gender marriage.[16] The University of Arizona determined that all secondary analyses for this project were exempt from institutional review board approval.

### Measures

Self-reported lifetime suicide behavior was assessed with a single question: "Have you ever tried to kill yourself?" The response options included: no; yes, once; yes, twice; and yes, more than 2 times. These responses were dichotomized such that 0 = never and 1 = ever.

Gender identity was captured with a single item: "Which of the following best describes you?" The response options included the following: female; male; transgender, male to female; transgender, female to male; transgender, do not identify as exclusively male or female; and not sure.

Adolescents reported several sociodemographic characteristics,

including age (≤11 years to ≥19 years), highest parental education (coded as 1 = completed grade school or less, 2 = some high school, 3 = completed high school, 4 = some college, 5 = completed college, and 6 = graduate or professional school after college), urbanicity (coded as 0 = farm to small city with <50 000 people and 1 = medium-to-large city with >50 000 people), race and/or ethnicity (American Indian or Alaskan native, Asian American, black or African American, Hispanic or Latino, Hawaiian native or other Pacific Islander, white, multiracial and/or multiple ethnicities, and other), and sexual orientation (only heterosexual, mostly heterosexual, bisexual, mostly lesbian or gay, and only lesbian or gay).

## Analysis

Prevalence statistics of self-reported suicide behavior with 95% confidence intervals (CIs) were estimated for all gender identity groups. Differences were examined by using a $\chi^2$ test in R with post hoc comparisons. A correction was applied to the *P* value (ie, $P = .05/15 = 0.003$) due to the number of statistical tests conducted ($N = 15$). All sociodemographic characteristics, including gender identity, were then included in a logistic regression with suicide behavior as the outcome. Finally, to examine within-group heterogeneity, multigroup logistic regressions were conducted with suicide behavior as the outcome and gender identity as the grouping variable. Given the large number of estimates requested in this model ($N = 84$), a *P* value correction was applied to reduce the likelihood of a type 1 error (ie, $P < .0006$ rather than $P < .05$). Missing data were handled by using multiple imputation ($N = 20$ imputations).[17] All analyses were conducted in Mplus version 7.[18]

# RESULTS

The analytic sample size included 120 617 adolescents ages 11 to 19 years (mean = 14.7; SD = 1.8). Consistent with national estimates of the transgender adolescent population (0.7%),[19] <1% of the sample identified as transgender: 0.2% ($n = 202$) as transgender, male to female; 0.1% ($n = 175$) as transgender, female to male; and 0.3% ($n = 344$) as transgender, not exclusively male or female (referred to as nonbinary). Additionally, a small percentage reported that they were not sure of their gender identity (0.9% [$n = 1052$]; referred to as questioning), whereas 50.6% ($n = 60 973$) identified as female, and 48% ($n = 57 871$) identified as male. Approximately 12% of adolescents identified as something other than only heterosexual: 4.9% as mostly heterosexual, 3.4% as bisexual, 0.6% as mostly lesbian or gay, and 0.7% as only lesbian or gay. The majority of the sample identified as white, non-Latino (62.7%); 10.2% Hispanic or Latino; 8% Asian American; 6.8% multiracial and/or multiple ethnicities; 6.6% black or African American; 1.1% American Indian or Alaskan native; and 0.5% Hawaiian native or Pacific Islander. Three and a half percent identified as another race and/or ethnicity. The majority of adolescents lived in rural areas or small cities (75.6%), and on average, adolescents had at least 1 parent who had completed some college (mean = 4.9; SD = 1.3). Demographic characteristics by gender identity are provided in Table 1.

Consistent with US estimates of adolescent suicide behavior (ie, 8.6% attempted suicide in past year and 14.6% made a plan to attempt suicide in past year),[4] a total of 14.1% of adolescents ($n = 17 007$) in the sample reported that they had ever tried to kill themselves 1 or more times. In Fig 1, the proportions of adolescents who self-reported suicide behavior is displayed by gender identity. A $\chi^2$ test revealed that suicide behavior and gender identity were associated ($\chi^2$ [degrees of freedom (df) = 5] = 2279.2; $P < .001$). Post hoc comparisons revealed that the attempted suicide behavior rates for each of the gender identity groups were significantly different from one another except for transgender, male to female, and questioning adolescents ($\chi^2$ [df = 1] = 0.08; $P = .78$) and transgender, female to male, and nonbinary youth ($\chi^2$ [df = 1] = 3.66; $P = .08$). At the bivariate level, transgender, female to male, adolescents (50.9% [95% CI: 45.51%–58.17%]) reported the highest rates of suicide behaviors compared with all other gender identity groups. Nonbinary adolescents reported the next-highest rate (41.8% [95% CI: 36.57%–47.22%]), followed by transgender, male to female, adolescents (30.0% [95% CI: 24.06%–36.59%]) and questioning adolescents (27.9% [95% CI: 25.27%–30.69%]). Female adolescents reported substantially lower rates (17.6% [95% CI: 17.31%–17.91%]) compared with transgender and questioning adolescents but higher rates than their male peers (9.8% [95% CI: 9.59%–10.08%]).

Logistic regression models revealed that transgender (male to female, female to male, and nonbinary), questioning, and female adolescents had higher odds of suicide behavior than their male counterparts after accounting for relevant sociodemographic characteristics (Table 2). Beyond gender identity, a nonheterosexual sexual orientation (ie, an identity other than only heterosexual) was associated with higher odds of suicide behavior, as was identifying as a racial or ethnic minority (ie, an identity other than white, non-Latino). Older adolescents also had higher odds of suicide behavior. Adolescents whose parents had higher education levels and who were residing in more urban spaces (compared with rural and/or small cities) had lower odds of suicide behavior.

**TABLE 1** Demographic Characteristics of the Sample by Gender Identity

| | Female | Male | Transgender, Male to Female | Transgender, Female to Male | Transgender, Not Exclusively Male or Female | Questioning |
|---|---|---|---|---|---|---|
| Age, mean (SD) | 14.70 (1.78) | 14.76 (1.79) | 15.15 (1.78) | 15.16 (1.80) | 15.34 (1.64) | 15.02 (1.69) |
| Parent education, mean (SD) | 4.78 (1.24) | 4.79 (1.24) | 4.66 (1.46) | 4.46 (1.47) | 4.54 (1.43) | 4.68 (1.46) |
| Urbanicity,[a] % | 24.4 | 24.1 | 18.2 | 18.9 | 21.5 | 19.2 |
| Sexual orientation, % | | | | | | |
| Only heterosexual | 87.7 | 94.2 | 44.8 | 19 | 11.6 | 56.7 |
| Mostly heterosexual | 6.4 | 3.3 | 7.9 | 11.3 | 14.1 | 14.9 |
| Bisexual | 4.9 | 1.4 | 16.7 | 32.7 | 37.0 | 15.4 |
| Mostly lesbian or gay | 0.5 | 0.4 | 15.8 | 16.7 | 21.1 | 7.0 |
| Only lesbian or gay | 0.4 | 0.7 | 12.3 | 20.2 | 16.2 | 6.0 |
| Race and/or ethnicity, % | | | | | | |
| American Indian or Alaskan native | 0.9 | 1.4 | 4.0 | 2.3 | 3.8 | 3.9 |
| Asian American | 8.2 | 7.9 | 8.5 | 10.3 | 10.6 | 8.4 |
| Black or African American | 6.3 | 7.0 | 9.5 | 8.0 | 7.0 | 6.8 |
| Hispanic or Latino | 10.6 | 9.9 | 8.0 | 10.9 | 7.6 | 6.4 |
| Native Hawaiian or Pacific Islander | 0.4 | 0.6 | 4.5 | 6.3 | 5.9 | 2.0 |
| White | 63.5 | 62.9 | 43.7 | 44.8 | 47.2 | 47.4 |
| Other | 3.3 | 3.6 | 5.5 | 5.2 | 7.9 | 10.5 |
| Multiracial and/or multiple ethnicities | 6.8 | 6.7 | 16.1 | 12.1 | 10.0 | 14.6 |

Subsamples include 0.2% ($n$ = 202) transgender, male to female; 0.1% ($n$ = 175) transgender, female to male; and 0.3% ($n$ = 344) transgender, not exclusively male or female. Additionally, a small percentage of adolescents reported that they were not sure of their gender identity (0.9% [$n$ = 1052]; referred to as questioning), whereas 50.6% ($n$ = 60 973) identified as female, and 48% ($n$ = 57 871) identified as male.

[a] Urbanicity is coded 0 = rural and small cities and 1 = urban locations.

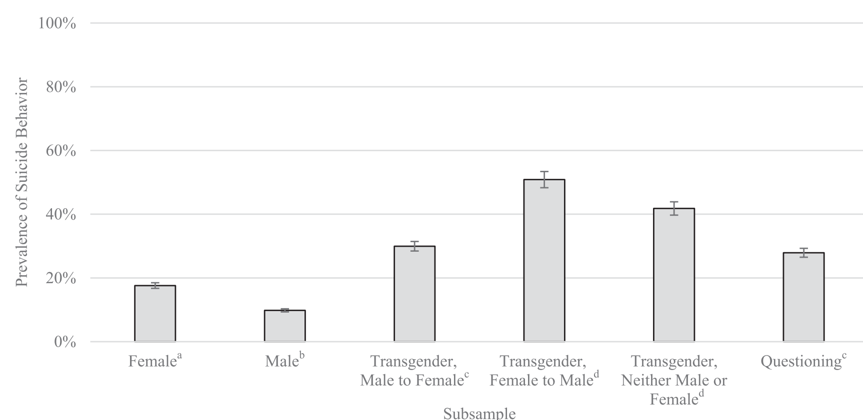


**FIGURE 1**
Percentages of self-reported suicide behavior among adolescents by gender identity. Subsamples include 0.2% ($n$ = 202) transgender, male to female; 0.1% ($n$ = 175) transgender, female to male; and 0.3% ($n$ = 344) transgender, not exclusively male or female. Additionally, a small percentage of adolesscents reported that they were not sure of their gender identity (0.9% [$n$ = 1052]; referred to as questioning), whereas 50.6% ($n$ = 60 973) identified as female, and 48% ($n$ = 57 871) identified as male. Different subscripts represent significant differences between groups ($P < .001$). [a] Female adolescents reported lower levels of suicide behavior compared to all transgender youth but higher levels compared to cisgender male adolescents. [b] Male adolescents reported the lowest levels of suicide behavior compared to all other groups. [c] Transgender, male to female, and questioning youth reported higher levels of suicide behavior compared to cisgender males and females but lower levels compared to transgender, female to male, and transgender, nonbinary youth. [d] Transgender, female to male, and transgender, nonbinary youth reported the highest levels of suicide behavior compared to all other groups.

Multigroup logistic regression models were used to test the associations between relevant sociodemographic characteristics and suicide behavior within each gender identity group (Table 3). For female adolescents, the findings from the initial regression that included all adolescents remained consistent with 3 exceptions: age, residing in urban spaces, and identifying as Asian American. For female adolescents, neither age, urbanicity, nor identifying as Asian American emerged as significant correlational predictors of suicide behavior. The findings for male adolescents were unchanged with the exception of the risk associated with identifying as Asian American.

Comparatively, among transgender (male to female and female to male) adolescents, only a nonheterosexual sexual orientation was associated with higher adjusted odds of reported suicide behavior (adjusted odds ratio [aOR] range: 2.44–3.75). For questioning adolescents, a slightly different pattern emerged: parent education remained a protective factor (aOR = 0.90), whereas identifying as bisexual and mostly or only lesbian or gay was associated with higher odds of reported suicide behavior (aOR range: 1.69–2.01) compared with only heterosexual, questioning youth. None of the sociodemographic characteristics were significantly associated with reported suicide behavior among nonbinary adolescents.

**TABLE 2** aORs With 95% CIs Used to Predict Suicide Behavior by Sociodemographic Characteristics

| Gender Identity (Reference = Male) | aOR (95% CI) |
|---|---|
| Female | 1.37 (1.34–1.39) |
| Transgender, male to female | 1.27 (1.04–1.54) |
| Transgender, female to male | 1.84 (1.52–2.24) |
| Transgender, not exclusively male or female | 1.38 (1.20–1.58) |
| Questioning | 1.40 (1.28–1.52) |
| Sexual orientation (reference = only heterosexual) | |
| Mostly heterosexual | 1.72 (1.66–1.79) |
| Bisexual | 2.85 (2.73–2.97) |
| Mostly lesbian or gay | 2.34 (2.13–2.58) |
| Only lesbian or gay | 2.25 (2.05–2.47) |
| Race and/or ethnicity (reference = white, non-Latino) | |
| American Indian or Alaskan native | 1.33 (1.22–1.45) |
| Asian | 1.05 (1.01–1.09) |
| Black or African American | 1.18 (1.13–1.22) |
| Hispanic or Latino | 1.32 (1.27–1.36) |
| Native Hawaiian or Pacific Islander | 1.43 (1.28–1.59) |
| Other | 1.24 (1.18–1.30) |
| Multiracial and/or multiple ethnicities | 1.35 (1.31–1.40) |
| Age | 1.02 (1.01–1.03) |
| Parent education | 0.92 (0.91–0.93) |
| Urbanicity (reference = rural and/or small city) | 0.96 (0.94–0.99) |

All estimates are significant at the corrected $P$ value of <.003.

**TABLE 3** aORs With 95% CIs Used to Predict Suicide Behavior by Gender Identity Group

| | Female | Male | Transgender, Male to Female | Transgender, Female to Male | Transgender, Not Exclusively Male or Female | Questioning |
|---|---|---|---|---|---|---|
| Age | 1.01 (1.00–1.02) | 1.04 (1.03–1.04)[a] | 0.95 (0.84–1.07) | 0.98 (0.88–1.10) | 0.99 (0.91–1.08) | 0.98 (0.94–1.03) |
| Parent education | 0.91 (0.90–0.92)[a] | 0.93 (0.92–0.94)[a] | 1.03 (0.90–1.17) | 0.96 (0.84–1.10) | 0.94 (0.85–1.03) | 0.90 (0.85–0.95)[a] |
| Urbanicity[b] | 0.95 (0.92–0.98) | 0.93 (0.89–0.96)[a] | 1.35 (0.80–2.27) | 0.98 (0.55–1.75) | 1.04 (0.73–1.50) | 0.83 (0.65–1.06) |
| Sexual orientation[c] | | | | | | |
| Mostly heterosexual | 1.75 (1.67–1.83)[a] | 1.74 (1.63–1.87)[a] | 2.44 (1.16–5.13) | 2.55 (1.10–5.89) | 0.75 (0.41–1.37) | 1.14 (0.88–1.47) |
| Bisexual | 3.05 (2.90–3.20)[a] | 2.70 (2.46–2.97)[a] | 2.47 (1.39–4.39) | 3.33 (1.72–6.43)[a] | 1.46 (0.88–2.43) | 1.69 (1.33–2.16)[a] |
| Mostly lesbian or gay | 2.60 (2.26–2.99)[a] | 2.03 (1.67–2.45)[a] | 3.19 (1.69–6.05)[a] | 2.89 (1.38–6.02) | 1.46 (0.84–2.54) | 2.01 (1.43–2.83)[a] |
| Only lesbian or gay | 2.48 (2.12–2.89)[a] | 2.14 (1.87–2.44)[a] | 3.75 (1.87–7.51)[a] | 3.65 (1.76–7.59)[a] | 1.38 (0.78–2.42) | 1.81 (1.26–2.58)[a] |
| Race and/or ethnicity[d] | | | | | | |
| American Indian or Alaskan native | 1.45 (1.28–1.64)[a] | 1.30 (1.15–1.47)[a] | 2.04 (0.84–4.95) | 0.79 (0.22–2.88) | 1.19 (0.57–2.50) | 1.02 (0.67–1.56) |
| Asian American | 1.00 (0.95–1.05) | 1.09 (1.03–1.16) | 0.76 (0.34–1.70) | 0.78 (0.39–1.53) | 0.73 (0.44–1.20) | 0.90 (0.65–1.24) |
| Black or African American | 1.20 (1.14–1.26)[a] | 1.24 (1.17–1.32)[a] | 1.16 (0.50–2.69) | 0.72 (0.28–1.83) | 1.06 (0.60–1.88) | 0.96 (0.66–1.39) |
| Hispanic or Latino | 1.45 (1.39–1.50)[a] | 1.34 (1.27–1.40)[a] | 1.53 (0.73–3.20) | 0.87 (0.41–1.85) | 1.18 (0.66–2.12) | 1.04 (0.71–1.51) |
| Native Hawaiian or Pacific Islander | 1.41 (1.19–1.68)[a] | 1.62 (1.37–1.91)[a] | 1.00 (0.37–2.69) | 0.46 (0.18–1.20) | 1.15 (0.59–2.24) | 1.01 (0.52–1.94) |
| Other | 1.23 (1.15–1.32)[a] | 1.26 (1.17–1.37)[a] | 1.67 (0.69–4.04) | 0.47 (0.13–1.71) | 1.08 (0.62–1.88) | 0.83 (0.60–1.13) |
| Multiracial and/or multiple ethnicities | 1.36 (1.30–1.43)[a] | 1.40 (1.33–1.48)[a] | 1.33 (0.72–2.44) | 1.16 (0.62–2.18) | 1.25 (0.78–1.99) | 0.95 (0.73–1.23) |

Subsamples include 0.2% ($n$ = 202) transgender, male to female; 0.1% ($n$ = 175) transgender, female to male; and 0.3% ($n$ = 344) transgender, not exclusively male or female. Additionally, a small percentage of adolescents reported that they were not sure of their gender identity (0.9% [$n$ = 1052]; referred to as questioning), whereas 50.6% ($n$ = 60 973) identified as female, and 48% ($n$ = 57 871) identified as male.

[a] Significantly differs from $P$ < .003.

[b] The reference group for urbanicity is rural and small cities.

[c] The reference group for sexual orientation is only heterosexual.

[d] The reference group for race and/or ethnicity is white, non-Latino.

## DISCUSSION

Suicide is the second leading cause of death among adolescents and young adults ages 10 to 34 years in the United States.[20] This study is the first large-scale study of adolescents to reveal the prevalence of suicide behaviors (the key antecedents of death by suicide) across diverse gender identities. Building on evidence from a state-level population study[3] and community-based studies,[6,12] our findings empirically reveal the strong association between identifying as transgender and suicide risk. In this study, between 30% and

51% of transgender adolescents reported engaging in lifetime suicide behavior; notably, this finding is consistent with some previous research revealing suicide risk among transgender populations.[5,8–10] Beyond providing additional and robust evidence for a disparity in suicide behavior for transgender and questioning adolescents, our study is also a direct response to the calls from the National Academy of Medicine (formerly the Institute of Medicine)[1] and others[11] to examine within-group variability among transgender populations. In doing so, we identified plausible between-group differences in the prevalence of self-reported suicide behavior as well as key covariate differences in helping to understand who is most at risk for suicide behavior within transgender adolescent populations.

Our findings reveal disparities in suicide behavior and important insight into the heterogeneity that exists within transgender populations. Consistent with some community-based studies of adolescents[6] and adults,[13,14] we found that transgender, female to male adolescents and nonbinary adolescents reported the highest rates of suicide behavior. Indeed, nearly 1 in 2 transgender, female to male and 2 in 5 nonbinary adolescents reported that they had tried to kill themselves, which is well above the <1 in 10 rate that was identified for male adolescents in this sample (presumably adolescents who are cisgender). Furthermore, we identified that the intersection of sexual orientation and gender identity (particularly for transgender adolescents who identify as male to female or female to male as well as those who are questioning their gender identity) is associated with exacerbated odds of suicide behavior (nearly 2–4 times higher odds compared with transgender adolescents who identify as only heterosexual). In addition, for most transgender subgroups, having parents with higher education levels and living in urban spaces did not appear to mitigate the odds for suicide behavior as it did for female and male adolescents.

There is an urgent need to understand why transgender, female to male, and nonbinary adolescents report engaging in suicide behavior at higher levels than other adolescent transgender populations. Qualitative methods are best positioned to deepen our understanding of this point. Previous research in adults reveals that transgender men report higher levels of gender discrimination compared with transgender women,[21] which may help to explain this difference in suicide behavior. Yet, few researchers have engaged in rigorous comparative research on the interpersonal and contextual experiences of transgender subgroups. Our findings mirror binary sex differences (ie, cisgender male compared with cisgender female) in suicide behaviors (eg, ideation and attempts) such that cisgender adolescent girls are more likely to engage in suicide-related behaviors.[22] Research reveals that this disparity by sex assigned at birth likely exists because of the different methods of suicide chosen by boys and girls.[22] Given that autopsy reports in the United States do not routinely collect information about gender that is inclusive of transgender identities, there are no prevalence estimates of suicide deaths for transgender adolescents. Yet, it is possible that there is survival bias in our data and others such that we can only assess suicide behaviors among those who have survived. Future research is needed to understand why transgender, female to male, and nonbinary adolescents are at such a high risk for suicide behaviors and to identify malleable protective factors that may mitigate this risk.

Beyond gender identity subgroup differences within the transgender adolescent population, our findings reveal the importance of intersecting identities and social positions. Previous investigations have been geographically limited to specific states[3] or were focused on adolescents in urban settings,[1,2] whereas we were able to examine possible disparities by geographical setting, with a large number of adolescents being located in rural and suburban areas. Consistent with previous research, identifying as nonheterosexual was associated with a heightened risk for suicide behavior with the exception of nonbinary adolescents. It is not clear from the current study why transgender adolescents who did not identify as exclusively male or female and who also identified as nonheterosexual did not experience the heightened risk for suicide behaviors similar to their peers. It may be that sexual orientation is complicated by nonbinary identities such that sexual orientation does not take on the same meaning[23] or have the same implications for health outcomes. That is, because current conceptualizations of sexual orientation rely on a gender binary (eg, same-, both-, or other-gender attractions), it is unclear what sexual identities mean in the context of nonbinary gender identities. Thus, already living life outside the tight constraints that US society places on gender may diminish the additional demands of heteronormativity for nonbinary youth. Future research is needed to understand the intersection of sexual orientation and gender identity, particularly for those who do not identify as cisgender.

Finally, we found that for the transgender adolescents in our sample, the protective benefits of

having parents with higher levels of education were not significant, nor was there an exacerbating effect of identifying as a racial and/or ethnic minority. These sociodemographic characteristics imply that we must carefully attend to variability in risk and protective factors when designing and implementing prevention programs. Level of education is often considered to be associated with more positive attitudes toward sexual and gender diversity, yet our results are similar to studies of parents of sexual minorities, for whom level of education was only weakly associated with parental concerns for the safety of their children.[24] Our finding that transgender youth of color were not at a higher risk compared with white transgender adolescents reveals the need (as others have found in studies of sexual minority youth of color[25]) to reconsider double-jeopardy narratives of intersectionality[26] and examine the unique protective factors that may emerge at the intersection of multiple oppressions. Yet, it is also possible that the small size of intersecting subgroups resulted in type II error; thus, future studies are needed with larger intersecting cell sizes to examine additive versus resilience narratives of intersectionality for transgender youth of color.

It is important to consider the limitations of this study when interpreting the results. Data for all variables were derived from adolescent self-report. Some longitudinal studies have revealed that self-reported suicide behaviors are not consistently reported across time.[27] According to these studies, our estimations of past suicide behavior might be underestimated. Future longitudinal work is needed to examine subgroup differences in suicide behaviors among transgender adolescents by using multiple indices of suicidality. Given that data for this study were last collected in 2015, it is critical to examine whether the rates documented in this study have remained stable, increased, or decreased. Additionally, although the study was national in scope, it was not nationally representative, and it is unlikely that the participants were representative of the larger transgender adolescent population. Compared with national statistics, adolescents who are white, non-Latino, Asian American, and multiracial and/or of multiple ethnicities were overrepresented in our sample, whereas Hispanic or Latino and black or African American adolescents were underrepresented.[28] Similarly, rural and suburban adolescents were also slightly overrepresented[28]; yet this is also a strength of the study because these populations tend to be excluded from the larger literature on transgender adolescents.[1] Limitations related to generalizability need to be addressed by adding inclusive gender identity assessments in national studies.

In this study, we did not assess constructs that are associated with risk and resilience for transgender youth. Research clearly reveals that minority identities are not the cause of health disparities. Ultimately, researchers must comprehensively examine the factors (eg, gender minority stress[29]) that explain why transgender adolescents experience higher odds of suicide behavior and, perhaps more importantly, why some transgender adolescents do not. For example, research reveals that family acceptance and support are associated with diminished disparities in depression between transgender and cisgender children.[30] Given the heterogeneity of risk that is identified in the current study, it is important for researchers to consider the variability in the efficacy of risk and protective factors to predict suicide behavior in future work.

## CONCLUSIONS

Our findings reveal the disparate burden of suicide-related behavior among gender-minority adolescents in the United States, particularly female to male and nonbinary transgender adolescents. Our findings also reveal the additive burden of identifying as nonheterosexual across gender identity groups with the exception of adolescents who identify as nonbinary. These results should be used to inform suicide prevention and intervention policy and programs that are aimed at reducing ongoing gender identity–related disparities in suicide behavior as well as ongoing research in which authors seek to better understand for whom and why suicide behavior risk exists.

### ABBREVIATIONS

aOR: adjusted odds ratio
CI: confidence interval
df: degrees of freedom

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