



The intersection of race, ethnicity, and gender and the prevalence of suicidal thoughts and behaviors

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ABSTRACT

The prevalence of suicidal thoughts and behaviors across distinct intersections of race/ethnicity and gender among adolescents remains understudied. The current study seeks to address this important gap in suicide scholarship using a statewide representative sample of U.S. Florida middle school and high school adolescents. Data drawn from the 2022 Florida Youth Substance Abuse Survey (FYSAS) ($N = 41,764$) were analyzed to examine disparities in suicidal thoughts and suicide attempts among 26 racial/ethnic and gender subgroups of middle school and high school aged adolescents. Survey-weighted prevalence estimates for both suicidality outcomes were generated, and binary contrasts were used to assess the statistical significance of the differences in the probabilities between members of each subgroup and youth belonging to all other subgroups. Our results indicate that the prevalence of suicidal thoughts and attempts was highly gendered and varied according to racial/ethnic subgroups. Native American girls reported more suicidal thoughts (49.9%) and attempts (16.5%) in the past 12 months than any race/gender group. Other racial/ethnic and gender groups that reported particularly high rates of suicidal thoughts and attempts were West Indian/Caribbean female adolescents (48.8% and 13.4%, respectively), Puerto Rican female adolescents (48.5% and 14.7%, respectively), and Black/non-Hispanic female adolescents (19.9% and 15.6%, respectively). Because certain gender and race/ethnic subgroups are at an increased risk for suicidality, more research is needed to better understand the risk and protective factors to determine which suicide prevention strategies might best serve each group.

1. Introduction

Suicide is the second leading cause of death among U.S. adolescents, and deaths due to suicide among youth have increased 45.2% in the past ten years (Centers for Disease Control and Prevention, 2022). Further, the number of adolescents who think about or attempt suicide is even higher than suicide-related deaths; in 2019, 15.7% of high school students nationwide had made a suicide plan, and 18.8% reported having seriously considered attempting suicide (Ivey-Stephenson et al., 2020). Because individuals who consider or attempt suicide are at an increased risk for an eventual suicide death, (Ivey-Stephenson et al., 2020; Jami-son, 2016; Lindsey et al., 2019) identifying groups which have a disproportionately high risk for suicidality is crucial for improving prevention and treatment strategies. Yet, research on the intersection of race/ethnicity and gender and the prevalence of suicidal ideation and attempts frequently has overlooked potential heterogeneity across

distinct subgroups of youth. Investigating this potential heterogeneity is important given the increasing racial and ethnic diversity of the U.S. population and the possibility that different constellations of risk and protective factors may explain variation in suicidal thoughts and behaviors according to race, ethnicity, and gender.

Recent studies examining racial/ethnic differences in suicidal behaviors among U.S. high school students have shown that, compared to non-Hispanic Black ($\cong 16.9\%$) and Hispanic youth ($\cong 17.2\%$), non-Hispanic White youth ($\cong 19.1\%$) are more likely to report having considered attempting suicide or creating a suicide plan (Ivey-Stephenson et al., 2020; Vincent et al., 2008). However, non-Hispanic Black youth ($\cong 11.8\%$) are more likely to report having attempted suicide compared to their non-Hispanic White ($\cong 7.9\%$) and Hispanic counterparts ($\cong 8.9\%$) (Ivey-Stephenson et al., 2020; Bostwick et al., 2014; Xiao et al., 2021). Examinations of differences in death by suicide across other racial/ethnic groups have found that non-Hispanic Native

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Table 1
Descriptive Statistics: Florida Youth Substance Abuse Survey (FYSAS) 2022, All Cases and Disaggregated by Gender.

Variables	All Cases %	Females %	Males %	Diff.
Suicidal thoughts in past 12 months				
No	65.61%	55.80%	75.19%	–
Yes (=1)	34.39%	44.20%	24.81%	19.39%***
Suicide attempt in past 12 months				
No	91.04%	87.11%	94.87%	–
Yes (=1)	8.96%	12.89%	5.13%	7.76%***
Race/ethnicity				
Mexican	7.19%	7.34%	7.06%	–
Central American	5.70%	4.99%	6.40%	–
Puerto Rican	7.59%	7.67%	7.51%	–
Cuban	4.54%	4.66%	4.41%	–
Other Hispanic	9.19%	8.66%	9.71%	–
Haitian	4.62%	4.63%	4.60%	–
West Indian/Caribbean	2.69%	2.96%	2.43%	–
Dominican	1.91%	2.06%	1.77%	–
Black/non-Hispanic	15.38%	16.55%	14.23%	–
Asian	2.18%	2.07%	2.29%	–
Native American	0.83%	0.65%	0.99%	–
Other/non-Hispanic	1.58%	1.58%	1.59%	–
White/non-Hispanic	36.60%	36.18%	37.01%	–
Gender				
Female	49.41%	–	–	–
Male	50.59%	–	–	–

Note. $N = 41,764$. N (Females) = 20,935. N (Males) = 20,829.

*** $p < .001$ (two-tailed).

American youth have the highest rate of suicide, with Asian American and Pacific Islander youth having the lowest suicide rates in the U.S. (Centers for Disease Control and Prevention, 2022). Moreover, recent trends in suicidality among U.S. adolescents over the past 30 years indicate that suicidal ideation among non-Hispanic Black and non-Hispanic Native American adolescents has increased, while this prevalence has decreased among other racial/ethnic groups (Xiao et al., 2021).

A gender disparity in adolescent suicidality also has been observed. While the suicide mortality rate for males is at least three times the rate for females, (Garnett et al., 2022) studies generally have shown that female youth report higher rates of lifetime suicidal ideation, suicide plans, and suicide attempts than male youth (Ivey-Stephenson et al., 2020; Lindsey et al., 2019; Bostwick et al., 2014; Xiao et al., 2021; Bridge et al., 2006; Curtin et al., 2022; Eaton et al., 2012; Mars et al., 2019; Rhodes et al., 2014; Rueter et al. 2008). However, recent studies have shown narrowing gender differences in self-reported suicidal ideation, (Twenge et al., 2018; Twenge et al., 2019; Yu and Chen, 2018) emergency department visits for suicidal ideation and nonfatal suicide attempts, (Mercado et al., 2017; Kalb et al., 2019; Wang et al., 2020; Plemmons et al., 2018) and suicide death (Yu and Chen, 2018; Ruch et al., 2019). Additionally, scholars have found that recent increases in suicidal ideation among female youth are largest among those who are non-Hispanic Black, non-Hispanic White, and Hispanic, (Xiao et al., 2021) and rates of suicide attempts as well as injuries caused by suicide attempts have increased substantially for Black male (Lindsey et al., 2019) and non-Hispanic White female adolescents (Xiao et al., 2021).

Despite this empirical attention on differences in suicidality across racial, ethnic, and gender groups, there are two important shortcomings of this body of research. First, studies have predominately examined suicidality across three main racial/ethnic categories: non-Hispanic White, non-Hispanic Black, and Latinx or Hispanic. Exclusive focus on these groups might obfuscate disparities in suicidal behaviors among adolescents who self-identify with other racial/ethnic categories (e.g., Asian, Native American) as well as members of specific Hispanic and Caribbean subgroups (e.g., Mexican, Cuban, Haitian, Dominican). Second, limited research has considered the intersection of gender and race/ethnicity in suicide behaviors among adolescents, and no such

study has employed racial/ethnic categorizations that capture distinct subgroup identities. Consequently, questions remain regarding the prevalence of suicidal thoughts and behaviors across these diverse subpopulations. The aim of the current study is to investigate the intersections of race, ethnicity, and gender in suicidal thoughts and behaviors across previously unexamined categories of youth. To address this important gap in existing literature, we utilize data from the 2022 Florida Youth Substance Abuse Survey (FYSAS). The FYSAS data enables us to examine the prevalence of suicidal thoughts and behaviors across 26 racial/ethnic and gender subgroups of middle school and high school adolescents.

2. Methods

2.1. Data

The present study draws on data from the 2022 Florida Youth Substance Abuse Survey (FYSAS). The FYSAS is annual survey administered to a multi-stage cluster sample of youth attending Florida public middle and high schools. In the first stage, schools were selected randomly at the county level, with each school's probability of selection being proportional to its enrollment size. In the second stage, classrooms within the participating schools were randomly selected. The 2022 FYSAS was administered to 50,925 youth attending 736 schools; the participation rate was 74.4% within middle schools and 68.3% within high schools.

Respondents who failed one or more validation checks were removed from the dataset by the vendor contracted by the state of Florida to process the surveys ($N = 3,353$). Additionally, for the current analyses, we deleted cases that were missing valid data on each of the study variables ($N = 5,808$), thus reducing the final sample to 41,764 respondents. To ensure that the estimates presented are representative of all students enrolled in public high schools and middle schools within Florida, we make use of the sampling weights provided in the FYSAS. This study was approved by the IRB of [Blinded for Review] University (IRB-2023-146).

3. Measures

Suicidal Thoughts. Suicidal thoughts were measured using a single item which asked participants, "During the past 12 months, how often have you thought about killing yourself?" Response options included "Never," "Rarely (1 time)," "Sometimes (2–3 times)," "Often (4–5 times)," and "Very Often (6 or more times)." For the analysis, the responses were recoded such that participants who reported experiencing suicidal thoughts at least once in the past 12 months were coded as 1.

Suicide Attempts. Suicide attempts were measured using a single item where participants were asked, "During the past 12 months, how many times did you attempt suicide?" Response options included "0 times," "1 time," "2 or 3 times," "4 or 5 times," and "6 or more times." Like the measure of suicidal thoughts, this item was recoded to be a dichotomous indicator of having attempted suicide at least once in the past 12 months ("Yes" = 1).

Race/Ethnicity. In the FYSAS, participants were prompted to respond to two separate items about their race and ethnic group identity. The response options for the first item included seven conventional categories of race (i.e., Black/African American, Asian, Native American, Native Hawaiian or Pacific Islander, Hispanic/Latino, White/Caucasian, and Other); respondents could select more than one option. The second item capturing ethnic identity presented nine mutually exclusive response options and asked which ethnic group best describes the respondent (i.e., Mexican, Central American, Puerto Rican, Cuban, Other Hispanic, Haitian, West Indian/Caribbean, Dominican, or None of these).

To create a single measure of race/ethnicity, we first used the responses from the ethnic group item to identify youth as Mexican, Central American, Puerto Rican, Cuban, Haitian, West Indian/Caribbean, or

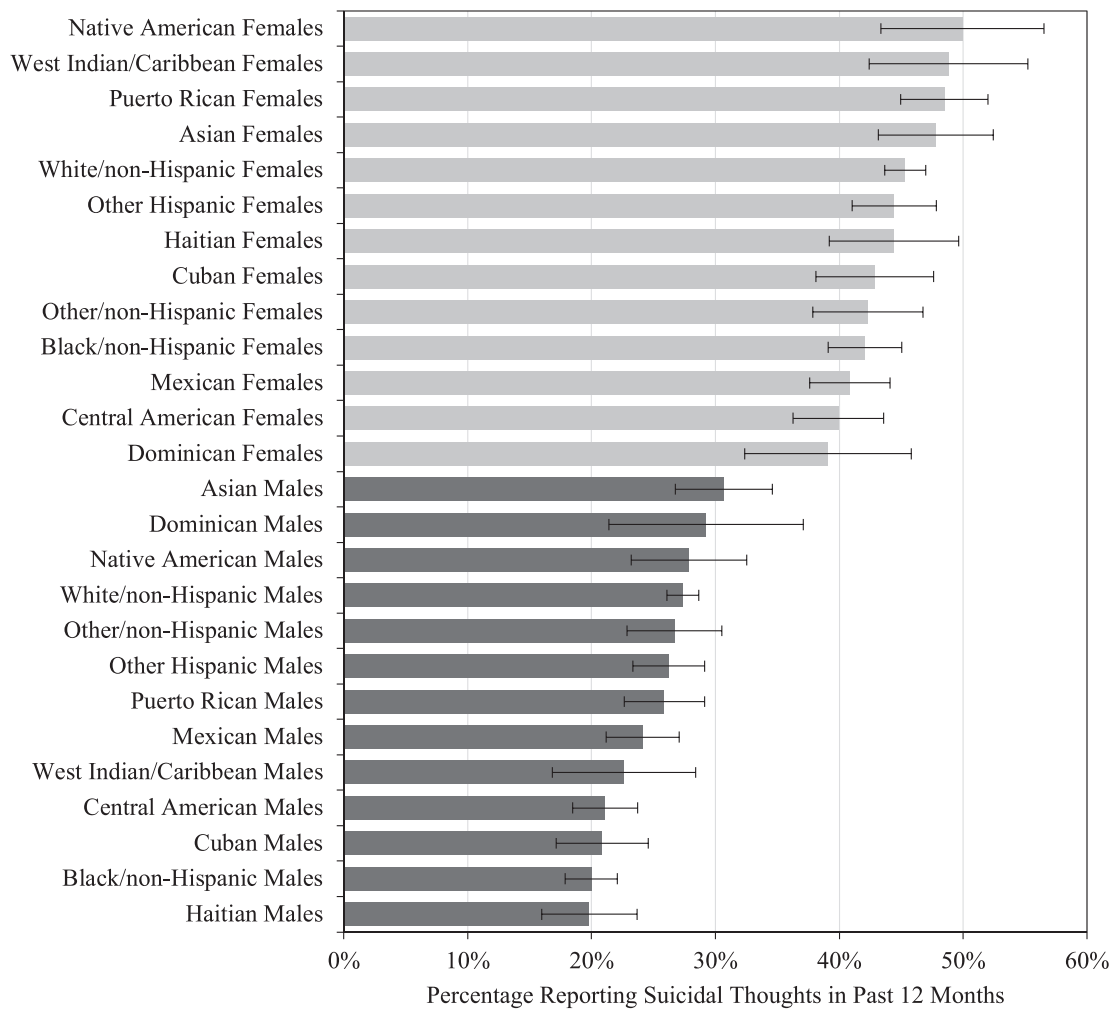


Fig. 1. Percentage Reporting Suicidal Thoughts in the Past 12 Months by Race/Ethnicity and Gender Note. *N* = 41,764. Weighted sample is used. Lighter and darker shades denote female and male subgroups, respectively. Error bars represent 95% confidence intervals.

Dominican. Youth who self-identified as “Other Hispanic” or who indicated via the race question that they were “Hispanic/Latino” yet did not select any of the above classifications were coded as Other Hispanic. Then, only among participants who selected “None of these” on the ethnic identity item, Black/non-Hispanic, Asian, and Native American youth were coded as such based on the conventional race measure. The category of Other/non-Hispanic included those who identified as “Other” on the race item and also selected “None of these” for the ethnicity item. The small number of Native Hawaiian/Pacific Islander participants were also categorized as Other/non-Hispanic. Lastly, youth were coded as White/non-Hispanic if they selected only “White/Caucasian” on the race item and “None of these” on the ethnic identity measure. All cases missing on the ethnic identity measure were coded as missing, as were cases with missing data on the race variable and who also answered “None of these” on the ethnicity item. Thus, the final measure of race/ethnicity includes 13 mutually exclusive categories.

Gender. The FYSAS includes a single item which asked participants to indicate whether they are male or female.

4. Statistical analyses

All analyses were conducted using Stata 17.0. We begin the analyses by presenting the descriptive statistics for the study variables, highlighting the prevalence of suicidal thoughts and suicide attempts in the past 12 months for all youth as well as for males and females separately. Next, we assess the bivariate relationships between each of the two

suicidality measures and race/ethnicity and gender. To enhance the interpretability of comparisons across racial/ethnic and gender subgroups, the 13-category race/ethnicity measure and the binary measure of gender are combined to create a single, comprehensive measure containing 26 mutually exclusive categories. This procedure allows for the racial/ethnic and gender subgroups to be rank-ordered according to the prevalence of suicidal thoughts and attempts. Because race/ethnicity and gender are demographic characteristics which precede other risk factors, the use of multivariate methods to estimate the adjusted probabilities while accounting for covariates that ostensibly might confound—but instead can only mediate—the effects of race/ethnicity and gender would only serve to obscure any differences across these subgroups.

The next stage of the analyses involves assessing the statistical significance of the between-group differences in the suicidality prevalence estimates. Such tests typically require selecting a single reference category against which all contrasts can be made, but this choice can be somewhat arbitrary in analyses of multichotomous predictors (Freese and Johfre, 2022). Further, contrasts with the grand mean (i.e., the overall prevalence in the sample) will tend toward zero for the categories which occur more frequently in the data, as larger groups exert a greater influence on the overall mean than smaller groups. To overcome these limitations, these analyses make use of binary contrasts, (Freese and Johfre, 2022) which allow for the prevalence estimate for each subgroup to be contrasted with the estimate among all cases that do not belong to that subgroup. Statistical significance is assessed using Wald

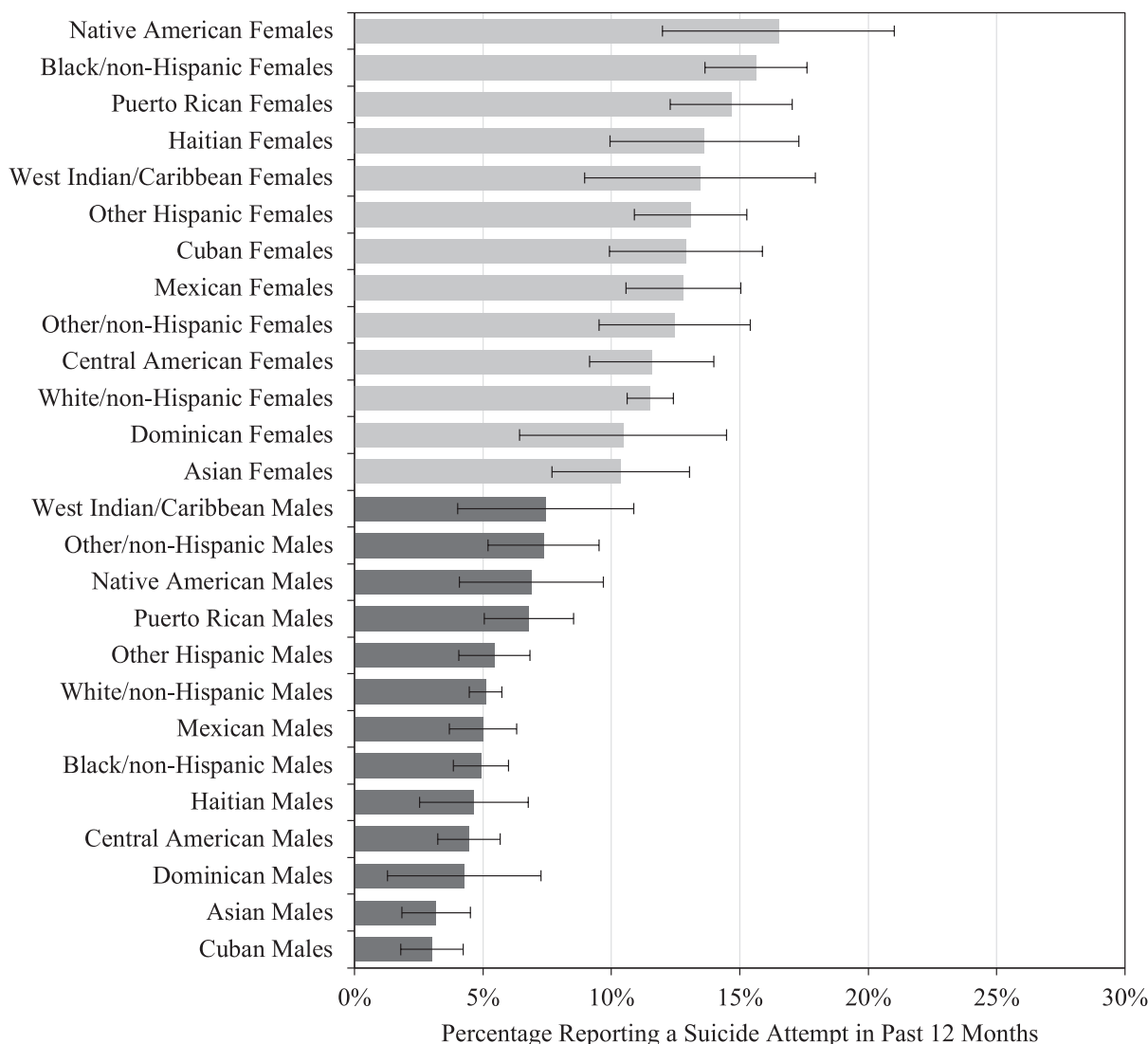


Fig. 2. Percentage Reporting a Suicide Attempt in the Past 12 Months by Race/Ethnicity and Gender Note. $N = 41,764$. Weighted sample is used. Lighter and darker shades denote female and male subgroups, respectively. Error bars represent 95% confidence intervals.

tests, (Mitchell, 2021) and the direction of each contrast indicates whether membership in each subgroup is associated with an increase or decrease in prevalence relative to all other subgroups.

5. Results

Table 1 presents the weighted descriptive statistics for the study variables for the full sample as well as disaggregated by gender. As shown, 34.39% of all youth reported suicidal thoughts in the past 12 months, and approximately 8.96% reported attempting suicide at least once. Notably, however, females were nearly twice as likely as males to report suicidal thoughts (females: 44.20%; males: 24.81%) and more than 2.5 times as likely to have reported a suicide attempt (females: 12.89%; males: 5.13%); both disparities are statistically significant ($p < .001$).

Presented in Fig. 1 are the percentages of youth who reported experiencing suicidal thoughts in the past 12 months according to the 26 subgroups of race/ethnicity and gender. These categories are ranked from highest to lowest according to the prevalence estimates. As shown, all 13 female subgroups have higher likelihoods of reported suicidal thoughts than all 13 male subgroups. Further, Native American female youth have the highest prevalence of reported suicidal thoughts

(49.94%), followed by West Indian/Caribbean females (48.81%), Puerto Rican females (48.48%), Asian females (47.80%), and White/non-Hispanic females (45.31%). Dominicans have the lowest prevalence of suicidal thoughts among female youth (39.09%); nonetheless, this estimate is notably higher than that among the next-ranked subgroups of Asian males (30.69%), Dominican males (29.23%), and Native American males (27.85%). The categories with the lowest prevalence include males who are Haitian (19.82%), Black/non-Hispanic (19.98%), Cuban (20.85%), and Central American (21.09%).

Shown in Fig. 2 are racial/ethnic differences in the proportion of youth who reported at least one suicide attempt in the past 12 months. As in Fig. 1, all 13 female subgroups have a higher prevalence of this outcome than the 13 male subgroups, with Native American females the most likely to have reported a suicide attempt (16.50%). Other subgroups with a notably high prevalence of suicide attempts include female youth who identify as Black/non-Hispanic (15.64%), Puerto Rican (14.67%), Haitian (13.63%), and West Indian/Caribbean (13.44%). Asian females have the lowest prevalence of suicide attempts in this gender group (10.36%), and West Indian/Caribbean male youth have the highest prevalence among males (7.44%). The adolescents with the lowest likelihood of having reported at least one suicide attempt are males who identify as Cuban (3.01%) and Asian (3.18%).

Table 2
Percentage Reporting Suicidal Thoughts and a Suicide Attempt in the Past 12 Months: Binary Contrasts by Race/Ethnicity and Gender.

Panel A: Suicidal Thoughts in Past 12 Months				Panel B: Suicide Attempt in Past 12 Months			
Rank	Subgroup	Contrast	SE	Rank	Subgroup	Contrast	SE
1.	Native American females	15.59%***	(0.034)	1.	Native American females	7.56%**	(0.023)
2.	Puerto Rican females	14.64%***	(0.018)	2.	Black/non-Hispanic females	7.27%***	(0.010)
3.	West Indian/Caribbean females	14.63%***	(0.033)	3.	Puerto Rican females	5.93%***	(0.012)
4.	Asian females	13.55%***	(0.024)	4.	Haitian females	4.77%**	(0.019)
5.	White/non-Hispanic females	13.30%***	(0.009)	5.	West Indian/Caribbean females	4.55%*	(0.023)
6.	Other Hispanic females	10.50%***	(0.017)	6.	Other Hispanic females	4.30%***	(0.011)
7.	Haitian females	10.26%***	(0.027)	7.	Cuban females	4.03%**	(0.015)
8.	Cuban females	8.67%***	(0.024)	8.	Mexican females	3.98%**	(0.011)
9.	Black/non-Hispanic females	8.36%***	(0.015)	9.	Other/non-Hispanic females	3.52%*	(0.015)
10.	Other/non-Hispanic females	7.97%***	(0.023)	10.	White/non-Hispanic females	3.11%***	(0.005)
11.	Mexican females	6.70%***	(0.017)	11.	Central American females	2.67%*	(0.012)
12.	Central American females	5.67%**	(0.019)	12.	Dominican females	1.50%	(0.020)
13.	Dominican females	4.75%	(0.034)	13.	Asian females	1.41%	(0.013)
14.	Asian males	-3.75%	(0.020)	14.	West Indian/Caribbean males	-1.54%	(0.018)
15.	Dominican males	-5.21%	(0.040)	15.	Other/non-Hispanic males	-1.63%	(0.011)
16.	Native American males	-6.58%**	(0.024)	16.	Native American males	-2.09%	(0.014)
17.	Other/non-Hispanic males	-7.79%***	(0.020)	17.	Puerto Rican males	-2.27%*	(0.009)
18.	Other Hispanic males	-8.58%***	(0.015)	18.	Other Hispanic males	-3.70%***	(0.007)
19.	White/non-Hispanic males	-8.65%***	(0.007)	19.	Mexican males	-4.11%***	(0.007)
20.	Puerto Rican males	-8.84%***	(0.017)	20.	Black/non-Hispanic males	-4.36%***	(0.006)
21.	Mexican males	-10.65%***	(0.015)	21.	Haitian males	-4.42%***	(0.011)
22.	West Indian/Caribbean males	-11.91%***	(0.029)	22.	Central American males	-4.66%***	(0.007)
23.	Central American males	-13.75%***	(0.014)	23.	Dominican males	-4.74%**	(0.015)
24.	Cuban males	-13.86%***	(0.019)	24.	White/non-Hispanic males	-4.75%***	(0.004)
25.	Haitian males	-14.92%***	(0.020)	25.	Asian males	-5.85%***	(0.007)
26.	Black/non-Hispanic males	-15.54%***	(0.011)	26.	Cuban males	-6.09%***	(0.007)

Note. $N = 41,764$. Binary contrasts represent the differences in proportions on the dependent variable between the observations belonging to the category denoted and those not belonging to that category. Contrasts are rank ordered by effect size. Statistical significance is determined using Wald tests.

SE = standard error.

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed).

Using the values shown in Fig. 1, the next stage of the analyses involved calculating the binary contrasts associated with the prevalence estimates of suicidal thoughts for each of the 26 subgroups. These contrasts are shown in Panel A of Table 2, with the reported values representing the discrete differences in the percentages between the subgroup denoted and cases not in that subgroup. We observe the largest positive differences in the prevalence of suicidal thoughts for Native American females (15.59%, $p < .001$), Puerto Rican females (14.64%, $p < .001$), West Indian/Caribbean females (14.63%, $p < .001$), and Asian females (13.55%, $p < .001$). Indeed, the contrasts for all female subgroups except for Dominican female youth are positive and statistically significant. However, the contrasts for all 13 male subgroups are in the negative direction, and 11 of these effects are statistically significant. The largest negative effect is found for Black/non-Hispanic males (-15.54%, $p < .001$).

A similar pattern is observed in the binary contrasts for a suicide attempt in the past 12 months, which are presented in Panel B of Table 2. These contrasts likewise highlight the distinctively high risk of suicidality among Native American female youth (7.56%, $p < .001$), and all but two contrasts for the 13 female subgroups are positive and statistically significant. Among males, youth belonging to 10 of the 13 race/ethnicity subgroups have a statistically significantly lower prevalence of suicide attempts than their counterparts in other subgroups, with the largest effects observed for Cuban males (-6.09%, $p < .001$), Asian males (-5.85%, $p < .001$), and White/non-Hispanic males (-4.75%, $p < .001$).

6. Discussion

This study shows there are disparities in suicide behaviors by race/ethnicity and gender. Among all youth in the sample, 34% reported experiencing suicidal thoughts, while roughly 9% reported attempting suicide. Girls reported a greater prevalence of suicidal thoughts (44.20% vs. 24.81%) and suicide attempts (12.89% vs. 5.13%) than boys. Additionally, Native American girls reported more suicidal thoughts and

attempts in the past 12 months than any race/gender group, which corresponds with recent prior work (Xiao et al., 2021). Other racial/ethnic and gender groups that reported particularly high rates of suicidality were Puerto Rican female youth, West Indian/Caribbean female adolescents, and Black/non-Hispanic female youth.

Consistent with prior literature on suicidality among adolescents, these results uncover that certain adolescent racial/ethnic subgroups are at a heightened risk for suicidal thoughts and behaviors, and these differences are highly gendered. Indeed, studies examining gender differences in the prevalence of suicidal behaviors also have found higher rates of suicidality among females (Ivey-Stephenson et al., 2020; Lindsey et al., 2019; Bostwick et al., 2014; Bridge et al., 2006; Curtin et al., 2022; Eaton et al., 2012). Prior research also has found differences in suicidal thoughts and behaviors according to race/ethnicity (Ivey-Stephenson et al., 2020; Bostwick et al., 2014; Xiao et al., 2021). However, a key contribution of these analyses to the extant literature is that these unique data allow us to assess suicidality across a much larger variety of discrete racial/ethnic groups compared to prior work. Overall, the findings presented in this study suggest that examinations of suicidal thoughts and behaviors across intersections of racial/ethnic and gender can be enhanced through the use of more robust measures of race/ethnicity, which enable researchers to further unpack artificial, monolithic categorizations of racial/ethnic identity such as "Hispanic." While prior scholarship has shown that suicidal behaviors generally are lower among Hispanic males and females than other racial/ethnic groups, (Ivey-Stephenson et al., 2020; Bostwick et al., 2014; Xiao et al., 2021) our findings show that certain Hispanic groups are disproportionality more likely to report suicidal behaviors. Taken together, these results suggest that future research on suicidality should consider more complex and nuanced intersections of gender and race/ethnicity.

Although the current study advances prior work on the relationships between gender, race/ethnicity, and suicidal behaviors, certain limitations should be noted. First, the prevalence estimates, especially those for males, may be affected by survivorship bias. As previous studies have

suggested, males have a higher suicide mortality rate than females, (Garnett et al., 2022) and survey data cannot be used to capture information on completed suicides. Second, due to social desirability bias, males may be less willing to report suicidal behaviors, which could partially explain the wide gender gap in suicidality observed in these data. Third, some prior studies focused on the prevalence of suicidal thoughts have asked respondents whether they “seriously thought about killing” themselves rather than “thought about killing” themselves.”(Ivey-Stephenson et al., 2020; Lindsey et al., 2019; Bostwick et al., 2014) The absence of the qualifier “seriously” in the wording of the measure of suicidal thoughts may explain why our estimates are somewhat higher than those reported in other recent work.

7. Conclusion

Overall, our findings indicate that members of certain racial and ethnic subgroups, and particularly females within these groups, have a distinctly high likelihood of experiencing suicidal thoughts and attempting suicide. Given these noteworthy differences in suicidality risk across racial/ethnic and gender groups, the factors at the individual, relationship, community, and societal levels which contribute to these disparities should represent a priority for future scholarship. Indeed, more research is needed to better understand the risk and protective factors that might be unique for each group of youth to determine which suicide prevention strategies might best serve youth across a range of backgrounds.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

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