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Exploring the Association Between Depression and Suicide Attempt by Race/Ethnicity

By

Bethany R. Stoller

Master of Public Health
Epidemiology

_____

Julie Gazmararian, PhD, MPH
Thesis Committee Chair

# Exploring the Association Between Depression and Suicide Attempt by Race/Ethnicity

By

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B.A.
Indiana University
2018

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An abstract of
A thesis submitted to the Faculty of the
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## Abstract

Exploring the Association Between Depression and Suicide Attempt by Race/Ethnicity

By Bethany R. Stoller

Adolescent depression and suicidality present significant public health problems in the United States. Both the prevalence of depression and the suicide rate among adolescents has increased significantly in the past two decades. While it is known that that risk of depression and suicidal behaviors varies by race/ethnicity, the effects of race/ethnicity on the relationship between suicide attempt and its predictors among adolescents has not previously been studied. The purpose of this thesis is to examine racial/ethnic differences in the relationship between depression, suicidal thoughts, suicide plan, and suicide attempts among American adolescents.

Cross-sectional data from the 2015 and 2017 Youth Risk Behaviors Surveys were used, and SAS survey procedures were used in all analyses to account for the complex survey design and weighting. Three sets of logistic models were conducted, with one for each of the exposures. Each set of models included crude and adjusted models for the total cohort, as well as stratified models for each race/ethnic group. Likelihood ratio tests were used to assess interaction between the exposure and race/ethnicity.

Depression, suicidal thoughts, and suicide plan were all significantly predictive of suicide attempts in every model. Race/ethnicity were found to be significant effect modifiers in the combined models and in a few groups in the stratified models. For each exposure, white students had the strongest relationship between the exposure and suicide attempts while black students had the weakest relationship. Single-race Hispanic students also had a significantly stronger relationship between suicidal thoughts and suicide attempts than the total cohort, while Asian students had a significantly weaker relationship between suicide plan and suicide attempts than the total cohort.

As the first study to examine these relationships among adolescents, these results suggest that the the experience of depression and suicidality among adolescents varies across racial/ethnic groups. Based on these results, further research is needed to better understand racial/ethnic differences in youth depression and suicidality.

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## Literature Review

### *Adolescent Depression*

Mental illness among youth remains a pervasive public health problem in the United States, with significant disparities by sex and racial/ethnic identity (1, 2). Depression, which is the most common mental disorder, is a leading cause of disability in the United States and is comorbid with many mental health disorders, in addition to being highly predictive of suicide (3,4). Depression onset typically takes place during adolescence (5). The morbidity and mortality associated with youth depression presents significant human and economic costs to society (6, 7).

The current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines major depressive disorder (MDD) as a disorder characterized primarily by depressed mood and/or loss of interest and pleasure in life. A major depressive episode (MDE) is defined as an episode of depressive symptoms lasting for at least two consecutive weeks, with symptoms present nearly every day. The psychological symptoms may be accompanied by somatic symptoms, such as fatigue and weight changes, depending on the individual. According to the DSM-5, children and adolescents may appear irritable rather than sad or hopeless and are more likely to experience hyperphagia and hypersomnia than those with later onset of depression (8). While depression affects people of all ages, risk of depression is lowest children below the age of 12 and increases dramatically during the teen years, peaking in the early 20s (8–10). Data from the 2016 National Survey of Children's Health indicate that 0.08% of children age 3-5 had a parent-reported diagnosis of depression, compared to 1.7% of children age

6-11 and 6.1% of adolescents age 12-17 (11). The reasons for the developmental increase in depression remain unclear. While some have hypothesized that the numerous life transitions and hormonal changes of puberty create emotional volatility in teenagers leaving them vulnerable to depression, others have argued that young children may experience depression but are lacking the abstract cognitive skills necessary to understand and articulate depressive symptoms (5).

In the United States, youth depression appears to have increased in recent years. According to the 2018 National Survey on Drug Use and Health (NSDUH) annual report, past-year prevalence of depressive symptoms among youth aged 12 to 17 increased from 9.0% in 2004 to a record-high 14.4% in 2018 (2). While the past-year prevalence of depression has also increased among adults aged 18 and over, the increase has been relatively modest, from 6.6% in 2004 to 7.2% in 2018 (2). These findings are consistent to analyses of the NSUDH data from 2010 to 2014, in addition to aligning with a similar increase in the adult population (12–14).

Perhaps the most studied risk factor of depression is gender (8,15). The gender disparity first appears during adolescence, while no gender disparity is seen among prepubertal children (5,6,16). The disparity is greatest among adolescents, with adolescent girls having about triple the odds of depression compared to adolescent boys (9,13,15). After adolescence, the association between gender and depression gradually attenuates, though adult women continue to have significantly higher depression prevalence than men across adulthood (15).

Adolescents who experience depression are at increased risk for depression later in life. In fact, depression at age 12 or older is more predictive of adult depression than is

childhood depression before age 12 (5,17). Even when depression does not reoccur in adulthood, depression in youth can cause lasting changes to cognitive function, including increased risk of substance use (6,18). While little is known about the lifelong outcomes of adolescent depression specifically, mental illness at a young age is associated with reduced educational attainment, hours worked as an adult, and family income (19). Other risk factors for depression have also been identified. In particular depression is comorbid with many other psychiatric disorders, particularly anxiety disorders and substance use (8,13). In addition, depression is associated with physical illness and is prevalent among patients with several chronic diseases (20).

*Adolescent Suicide*

In 2017, suicide was the second leading cause of death among children aged 10-14 years and young adults aged 15-24 years (21). While etiologies of suicide remain difficult to parse, it is known that many psychiatric disorders, such as major depression, bipolar disorder, and anxiety disorders, are predictive of suicide (3,22,23). Suicidal thoughts and behaviors are common among those experiencing major depressive episodes (22). In particular, a sense of hopelessness, which is one of the diagnostic criteria of major depression, is strongly correlated with suicidal thoughts and behaviors (22). It is estimated that as many as 80% of adolescent suicide victims experience depressive symptoms around the time of death (24).

While the suicide rate among the 10-24 age group was relatively stable from 2000 to 2007, it increased from 6.8 per 100,000 in 2007 to 10.6 per 100,000 in 2017. For children aged 10-14, the suicide rate more than doubled in that time period, increasing from 0.9 per 100,000 to 2.5 per 100,000. Adolescents aged 15-19 had an increase from

6.7 per 100,000 in 2007 to 11.8 per 100,000 in 2017. Of note, is that for the combined 10-24 age range, the suicide rate is now higher than the homicide rate (25).

Similar to depression, adult women are at higher risk of suicidal thoughts and behaviors than adult men. While women attempt suicide at higher rates than men, men are more likely to complete suicide, leading to an overall higher rate of suicide among men than women. This phenomenon is sometimes referred to as the "gender paradox" (22,24). The relationship is weaker among those with depression, though it is still significant (8). Similar to the gender disparity in depression, the gender disparity in suicide and suicidal behaviors first appears during adolescence (3).

*Racial Disparities*

The prevalence of depression varies across racial and ethnic groups. While white adolescents have a higher reported prevalence of depression than any other single-race group, multiracial adolescents have a higher prevalence than white adolescents (9). However, these analyses often do not include underrepresented minorities, such as American Indians and Pacific Islanders. According to data from the 2010-2011 NSDUH, past-year depression prevalence for children and teenagers was 7.9% among Hispanics, 6.9% among non-Hispanic blacks, 8.6% among non-Hispanic whites, 10.1% among those who selected multiple races, and 6.7% among those who identified as another non-Hispanic race, which included American Indian/Alaska Natives, Asians, and Pacific Islanders (9).

Disparities in suicide can also be found across racial/ethnic groups. American Indian/Alaska Natives (AIAN) have the highest rate of suicide, followed by non-Hispanic white Americans (26); while black, Hispanic, and Asian/Pacific Islander individuals have

significantly lower rates (27). Among the 15-24 age range, the suicide rate among AIANs was 53.7 per 100,000 for males and 20.5 per 100,000 for females in 2017—compared to 27.2 per 100,000 for males and 6.4 per 100,000 for females among white Americans, which is the group with the next highest rate. For black adolescents of the same age range, the rate was 16.8 per 100,000 for males and 4.5 per 100,000 for females. For Hispanic adolescents, the rate was 15.6 per 100,000 for males and 1.8 per 100,000 for females. For Asian/Pacific Islander adolescents, the 16.9 per 100,000 for males and 6.6 per 100,000 for females (27). However, it is worth noting that misclassification of race and ethnicity on death certificates, particularly among the AIAN group, may result in underreporting of suicide mortality for some groups (28). One explanation of racial/ethnic disparities in suicide may be the prevalence of stressful life events, which are highly predictive of suicide. These types of stressors are likely distributed unevenly across demographic groups (23).

When examining these racial disparities, it is important to consider that some groups may be less likely to report depressive symptoms or may be underdiagnosed. While white Americans have the highest reported prevalence of depression among all single-race groups, minority populations report depressive episodes that are longer and more severe, suggesting that they may not be diagnosed until symptoms have become debilitating (29). Stigma and lack of belief in treatability may also play a role in some groups. For example, a recent study found that Pacific Islander adults held more stigmatized views of depression than the general population and were less likely to consider treatment as a viable option for addressing mental illness (30). Because of that,

individuals in that community may be less inclined to report depressive symptoms or seek a diagnosis.

Underdiagnosis and underreporting are compounded by culture-based differences in manifestations of depression across racial/ethnic group. Clinicians may be unaware of or insensitive to differences in presentation across communities and may therefore underdiagnose or misdiagnose non-white patients (29). In some cultures, patients are more likely to report somatic depression symptoms, which may be mistaken for other illnesses (31,32). It has been suggested that cultural constructs of depressive symptoms function as a means of understanding and articulating a complex array of symptoms, which may result in emphasis of somatic symptoms in some cultures, while others emphasize psychological symptoms (31).

Even when a diagnosis is made, treatment utilization varies by racial/ethnic group. A 2015 study of mental health service utilization among adolescents with suicidal thoughts and behaviors found that black Americans and American Indians were less likely to receive outpatient treatment than white Americans (33). A 2018 study of service utilization among adults with suicidal thoughts and behaviors (STBs) found similar results, though AIAN individuals did not have significantly lower utilization of outpatient services than white Americans (34). This study also found that multiracial adolescents were less likely to receive inpatient treatment than white adolescents (33).

However, racial/ethnic categories are socially constructed and are made up of subgroups that do not necessarily share the same experiences. For example, the AIAN group is composed of many different federally recognized tribes, each with varying demographic makeup (35). Within racial and ethnic groups, depression and suicide vary

across subgroups (31). A nationally representative study found that, among black Americans, men of Caribbean descent reported higher prevalence of suicidal thoughts and behaviors than men of African descent. However, women of African descent had higher prevalence of suicidal thoughts and behaviors than women of Caribbean descent (36). Within any given group, cultural norms can affect different people in different ways, resulting in a diversity of experiences (31).

Even within a single racial/ethnic group, the relationship between depression and suicidality can vary. A recent analysis of a nationally representative study of American adults found that past-year depression was associated with past-year suicide attempts among most racial/ethnic groups, but not among black or multiracial adults (37). Moreover, a 2014 study found that Korean adults meeting the DSM-5 criteria for major depression experienced less depressed mood but higher suicidality on average than their American counterparts (38). Two recent studies in the United States found that black Americans experience less hopelessness—which is one of the strongest predictors of suicide—than white Americans, even among patients with depression (33, 34). One explanation for this is community resilience, integration, and support, which have all been identified as protective factors (29).

However, there is little research examining this discrepancy. While adolescent depression and suicidality are widely acknowledged as significant public health concerns, there has been minimal research examining if the relationship between adolescent depression and suicidality is modified by racial/ethnic identity. This analysis seeks to elucidate the relationships between adolescent depression, suicidal thoughts, suicide plan, and suicide attempts across racial/ethnic groups.

## Methods

### *Study Design*

The Youth Risk Behavior Survey (YRBS) is a nationally representative survey of American high school students, which assesses a wide variety of health behaviors, including substance use, dietary behaviors, physical activity, sexual behaviors, and behaviors related to injuries and violence. The YRBS uses a three-stage cluster design to sample high school students at public and private schools in the 50 states and the District of Columbia, using equal probability systematic sampling. The survey is conducted in person at schools and it is self-administered (41). For this analysis, the 2015 YRBS and the 2017 YRBS were combined to ensure adequate cell counts for underrepresented minorities. Further detailed information regarding this survey can be found in the YRBS Data User's Guide (42).

### *Data Source*

Data for the 2015 YRBS were gathered from students grades 9 through 12 at 128 public high schools across the country, with an overall response rate of 60%. The data for the 2017 YRBS were gathered from students in grades 9 through 12 at 144 public high schools across the country, with an overall response rate of 60%. The total combined study population consisted of 30,389 students. The survey includes questions regarding sexual activity, substance use, violence, physical activity, and nutrition. The survey uses clustering and survey weights to ensure accurate representation of all demographic groups.

*Exposure*

The primary exposure of interest for this study was self-identified past-year depression symptoms. Students were asked the question, “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?” The response options were “yes” and “no.” The YRBS dataset contains both a numeric and a character version of this variable. For the purposes of this analysis, students who answered “yes” to this question will be considered as having depression.

Additional predictors of suicidal behavior were included as secondary exposures of interest. These consisted of suicidal thoughts and making a plan to attempt suicide. Suicidal thoughts were assessed with the question, “During the past 12 months, did you ever seriously consider attempting suicide?” Making a plan to attempt suicide was assessed with the question, “During the past 12 months, did you ever make a plan about how you would attempt suicide?” For both questions, the response options were “yes” and “no.”

*Outcome*

Past-year suicide attempt was used as the outcome for this study and was measured with the question “During the past 12 months, how many times did you actually attempt suicide?” A dichotomized variable was calculated from this question. All students who indicated they had attempted suicide one or more times in the past year were categorized as having a past-year suicide attempt.

*Effect Modifiers*

The modifier of interest was self-identified racial and ethnic group. This was measured with two questions. First, race was measured by the question "What is your race?" Response options included "American Indian/Alaska Native," "Asian," "Black or African American," "Native Hawaiian/Other Pacific Islander," and "White." Respondents were able to select multiple racial groups, if applicable. Second, ethnicity was measured by the question "Are you Hispanic or Latino?" which had dichotomous response options, with "yes" and "no" as the possible responses.

The YRBS also included a combined race/ethnicity variable, which was calculated using the responses from the two questions described above. All students who marked only one race and did not self-identify as Hispanic or Latino were categorized into the single-race group they selected. Students who did not mark any race and self-identified as Hispanic or Latino were categorized as "Hispanic/Latino." Students who marked multiple races and did not self-identify as Hispanic or Latino were categorized as "Multiple– Non-Hispanic/Latino," and students who marked one or more race and additionally self-identified as Hispanic or Latino were categorized as "Multiple–Hispanic/Latino."

*Covariates*

Sex and age were included as covariates. Sex was self-identified, with "female" and "male" as the only response options. Age was self-identified through the question "How old are you?" Response options were ordinal, with "12 years old or younger" as the youngest category, ages 13 through 17 as single response options, and "18 years or older" as the oldest category.

*Statistical Analyses*

All analyses were completed using SAS 9.4. The SAS survey procedures were used for all analyses to account for the survey weights, clustering, and strata. Initial descriptive statistics were calculated for all included variables. Bivariate analysis included a chi-square test to determine if any of the relationships were significant. Variables with significant associations with the exposures and the outcome were considered as potential confounders in the multivariate analysis. Observations with missing data for the included variables were dropped for the multivariate analyses. This included 4,002 missing observations for past-year suicide attempt, which was the question with the highest frequency of missing observations.

Three sets of models were generated, with one for each exposure. Within each set, a combined model was created to assess the relationship across all racial/ethnic groups. The DOMAIN statement was then used to create stratified models for each race/ethnicity, resulting in nine models for each exposure. To assess interaction, the Likelihood Ratio Test was used to first evaluate general interaction terms for the race/ethnicity variable within each exposure. Then, interaction terms specific to race/ethnic groups were used to assess interaction in each group.

**Results**

The study population represented an equal number of male and female students, with the majority being white (54%), followed by Black (13.5%), multiracial Hispanic (12.7%) and single-race Hispanic (9.9%) (Table 1). Almost one-third (30.7%) of the sample reported past-year depressive symptoms, 17.5% reported past-year suicidal thoughts, 14.1% reported having made a plan to attempt suicide in the past year, and 8% reported a past-year suicide attempt.

Bivariate results for each exposure are summarized in Tables 2A-2D. Depression was significantly associated with sex, race/ethnicity, suicidal thoughts, suicide plan, and suicide attempt ($p<0.0001$) and grade in school ($p=0.0118$) (Table 2A). Specifically, female students, those reporting suicidal thoughts, those reporting a suicide plan, and those with past-year suicide attempts were more likely to report past-year depression than their counterparts. Self-reported depression increased from 9$^{th}$ to 10$^{th}$ grade, peak in 11$^{th}$ grade, and decline in 12$^{th}$ grade. Among the racial/ethnic groups, the multiracial non-Hispanic students reported the highest prevalence of depression, followed by the multiracial Hispanic group and the AIAN group.

Suicidal thoughts were significantly associated with sex, race/ethnicity, depression, suicide plan, and suicide attempt ($p<0.0001$) and grade in school ($p=0.0014$) (Table 2B). Specifically, female students, those reporting depression, those reporting a suicide plan, and those with a past-year suicide attempts had increased prevalence of suicidal thoughts. Self-reported suicidal thoughts increased from 9$^{th}$ to 10$^{th}$ grade and declined in 11$^{th}$ and 12$^{th}$ grade. Among the racial/ethnic groups, the multiracial non-

Hispanic students reported the highest prevalence of suicidal thoughts, followed by the AIAN group and the multiracial Hispanic group.

Suicide plan was significantly associated with sex, race/ethnicity, depression, suicidal thoughts, and suicide attempt ($p<0.0001$) and grade in school ($p=0.0219$) (Table 2C). Female students, those reporting depression, those reporting suicidal thoughts, and those with a past-year suicide attempts had increased prevalence of having a suicide plan. Self-reported suicide plan increased from 9$^{th}$ to 10$^{th}$ grade and declined in 11$^{th}$ and 12$^{th}$ grade. Among the racial/ethnic groups, the multiracial non-Hispanic students were most likely to report a suicide plan, followed by the NHOPI group and the multiracial Hispanic group.

Suicide attempts were strongly associated with sex, grade in school, race/ethnicity, depression, suicidal thoughts, and suicide plan ($p<0.0001$) (Table 2D). Female students, those reporting depression, those reporting suicidal thoughts, and those reporting a suicide plan had increased prevalence of suicide attempts. Among the racial/ethnic groups, the multiracial non-Hispanic students reported the highest prevalence of suicide attempts, followed by the AIAN group and the multiracial Hispanic group.

The concordance between suicidal thoughts, suicide plan, and suicide attempt is shown in Table 3. Of those with past-year suicidal thoughts, 62% reported making a plan and 35% reported an attempt. Among students who reported making a plan, 77% also reported suicidal thoughts and 38% reported an attempt. While both suicidal thoughts and suicide plan were associated with having a suicide attempt, suicidal thoughts were more prevalent than suicide plan among those with a past-year suicide attempt, with 90% of

those reporting an attempting also reporting suicidal thoughts and 78% also reporting making a plan.

The interaction assessment found that the general race/ethnicity term was a significant effect modifier for all three exposures ($p<.0001$) (Table 4). Race/ethnicity was found to interact with depression in the white and black groups. Interaction was also found with suicidal thoughts in the white, black, and single-race Hispanic groups and with suicide plan in the white, black, and Asian groups.

The results of the stratified analyses are shown in Tables 4-6 All three models converged and were significant ($p<.0001$). Depression was significantly associated with suicide attempt in all racial/ethnic groups (Table 4). The strongest association was found in the white group, and the weakest association was found in the black group. Suicidal thoughts were significantly associated with suicide attempt in all racial/ethnic groups (Table 5). The association was strongest in the single-race Hispanic group, followed by the white group, and was found to be weakest among the black group. Suicide plan was also significantly associated with suicide attempt in all racial/ethnic groups (Table 6). The association was found to be strongest in the white group and lowest in the Asian group and the black group.

**Discussion**

Results from this study offer a complex examination of the relationships between depression, suicidal thoughts, suicide plan, suicide attempts, and race/ethnicity. The hypotheses of this analysis were that the relationship between depression, suicidal thoughts, and suicide plan and past-year suicide attempts among this cohort would be modified by self-identified race/ethnicity. While in broad terms the hypothesis is supported by the results, the situation is more nuanced than simply concluding that race/ethnicity moderates the relationship.

Past-year depression, suicidal thoughts, and suicide plan were all significantly predictive of past-year suicide attempt for the total cohort and for each racial/ethnic group. However, as hypothesized, the strength of this relationship varied by racial/ethnic group. For all predictors, the association was strongest among white students and weakest among black students. In addition, there was evidence that race/ethnicity affects the relationship between suicidal thoughts and suicide attempt for Hispanic students and the relationship between suicide plan and suicide attempt for Asian students. This suggests that not only is there effect modification by race/ethnicity, but that the modification is not the same for the three predictors. Broadly speaking, the results suggest that the experience of depression and suicidality among teenagers can be quite different for students of different backgrounds. This study is the first to identify racial/ethnic differences in the relationship between suicide and its risk factors among adolescents.

While literature in this area is sparse, these results have some similarities to the findings of data from the National Survey on Drug Use and Health (37). In that study, the authors evaluated race/ethnicity as a moderator of the relationship between depression

and suicide attempts among a nationally representative sample of American adults and found that the relationship was not significant for black and multiracial adults. While depression was found to be significantly associated with suicide attempts in the present study, it is notable that the relationship was significantly weaker among black participants than among non-black participants. However, in contrast to previous findings, race/ethnicity did not affect the relationship between depression and suicide attempt for either of the multiracial groups (37). This discrepancy may be due to differences in etiologies of suicide attempts between adolescents and adults or by greater willingness on the part of adolescents to disclose symptoms of depression.

*Strengths and Limitations*

There are at least four strengths of this study. First, it is a nationally representative sample, which captures a cross-sectional sample of American high school students. Second, because the YRBS is designed to oversample underrepresented subgroups, this analysis was able to include groups that are often excluded from studies of youth mental health. Third, the large sample size meant that each of these groups had substantial representation in the data and that the analysis had excellent precision. Finally, the YRBS also includes several distinct questions related to suicidal thoughts and behaviors, which made it possible to examine relationships between suicidal thoughts, suicide plan, and suicide attempts rather than limiting the analysis to depression and suicide attempts.

Despite these strengths, there are at least four limitations. First, the large sample can create problems in drawing conclusions from the results because the number of participants included in the dataset means that some minor group differences may appear statistically significant regardless of whether they are meaningful differences. Second,

despite the large sample, the AIAN and NHOPI samples were likely to be insufficient to answer the current research question, given that these groups are underrepresented in the public school system. Third, it is likely that some students were likely reluctant to disclose mental health status and that some racial/ethnic groups may be less likely to self-report suicidal thoughts and behaviors. Finally, there was also a large amount of missing data for the suicide attempt questions. While we have hypothesized that this may be due to participants mistakenly believing there was a skip pattern in the survey, there is the possibility that these data were not missing at random.

*Implications for Future Research*

This study can provide a foundation for future research on the role of race/ethnicity in affecting etiologies of suicide. The results suggest that race/ethnicity should be examined not only as a risk factor for depression and suicidal thoughts and behaviors, but as a moderator of the predictors of suicide. Given that most studies on this topic only assess race/ethnicity as a risk factor for suicide attempts or as a proxy for other risk factors, such as historical trauma, these results suggest that the current literature does not adequately account for the role of racial/ethnic identity in adolescent mental health. In addition, the lack of power for the NHOPI and AIAN groups suggests that to gain a complete picture of adolescent mental health, a nationally representative, school-based system may not be sufficient because it will not be able to assess the needs of groups that are underrepresented in the public school system. To speak to etiologies of suicide attempts in these groups, greater efforts must be made to design studies to collect data on mental health issues in those populations.

Further research is also needed on the mental health of multiracial youth. Though compared with the other groups, multiracial students did not have a stronger or weaker relationship between depression, suicidal thoughts, suicide plan, and suicide attempts, non-Hispanic multiracial students had the highest prevalence of all of these mental health concerns. This is in keeping with other studies that include multiracial adolescents as a subgroup in their sample. To understand why multiracial youth are at higher risk than other groups, it will be necessary to focus more research on the needs of this group. Qualitative reseach may be useful to indentifying underlying social and psychological issues that may create unique difficulties for multiracial adolescents.

*Conclusions*

Despite the extensive literature on depression and suicidality among American youth, racial/ethnic identity has most often been examined in the context of disparities in negative mental health outcomes. This analysis provides evidence that the experience of depression and suicidality can be different for youth of different backgrounds. However, given the lack of data on underrepresented subgroups with high prevalences of depression and suicidality, there is a need to better understand the experiences of youth from those groups.

**Table 1**: Demographic characteristics of a sample of 30,389 American high school students who participated in the 2015 and 2017 YRBS

| Variable | Weighted Frequency | Percent |
|---|---|---|
| | | |
| Total | 30,389 | 100.0 |
| | | |
| Sex | | |
| Female | 14,978 | 49.7 |
| Male | | |
| | | |
| Grade | | |
| 9th | 8,219 | 27.2 |
| 10th | 7,743 | 25.7 |
| 11th | 7,216 | 23.9 |
| 12th | 6,960 | 23.1 |
| | | |
| Race/Ethnicity | | |
| White | 16,072 | 54.0 |
| Black | 4,018 | 13.5 |
| Hispanic | 2,935 | 9.9 |
| Asian | 1,080 | 3.6 |
| NHOPI[1] | 210 | 0.7 |
| AIAN[2] | 162 | 0.5 |
| Multiracial Hispanic | 3,777 | 12.7 |
| Multiracial non-Hispanic | 1,509 | 5.1 |
| | | |
| Past-year depression | | |
| Yes | 9,420 | 30.7 |
| No | 20,562 | 69.4 |
| | | |
| Past-year suicidal thoughts | | |
| Yes | 5,247 | 17.5 |
| No | 24,772 | 82.5 |
| | | |
| Past-year suicide plan | | |
| Yes | 4,190 | 14.1 |
| No | 25,530 | 85.9 |
| | | |
| Past-year suicide attempt[3] | | |
| Yes | 2,109 | 8.0 |
| No | 24,259 | 92.0 |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native
[3] The weighted frequency of missing observations for past-year suicide attempt was 4,022

**Table 2A**: Bivariate analysis of depression and covariates

| Variables | Weighted Frequency | Row % | Chi-Square | P-Value |
|---|---|---|---|---|
| | | | | |
| Sex | | | 229.7 | <.0001 |
| Female | 5,994 | 40.4 | | |
| Male | 3,123 | 20.8 | | |
| | | | | |
| Grade | | | 12.9 | 0.0118 |
| 9th | 2,359 | 29.1 | | |
| 10th | 2,377 | 31.1 | | |
| 11th | 2,278 | 31.9 | | |
| 12th | 2,106 | 30.5 | | |
| | | | | |
| Race/ethnicity | | | 64.8 | <.0001 |
| White | 4,676 | 29.3 | | |
| Black | 1,073 | 27.1 | | |
| Hispanic | 987 | 34.0 | | |
| Asian | 283 | 26.8 | | |
| NHOPI[1] | 63 | 30.4 | | |
| AIAN[2] | 55 | 34.8 | | |
| Multi. Hispanic | 1,303 | 34.9 | | |
| Multi. non-Hispanic | 587 | 39.2 | | |
| | | | | |
| Suicidal thoughts | | | 5,386.7 | <.0001 |
| Yes | 4,119 | 79.0 | | |
| No | 5,015 | 20.3 | | |
| | | | | |
| Made a plan | | | 5,833.2 | <.0001 |
| Yes | 3,227 | 77.4 | | |
| No | 5,880 | 22.9 | | |
| | | | | |
| Attempted Suicide | | | 1,753.6 | <.0001 |
| Yes | 1,687 | 81.2 | | |
| No | 6,405 | 26.5 | | |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2]AIAN: American Indian/Alaska Native

**Table 3B:** Bivariate analysis of suicidal thoughts and covariates

| Variables | Weighted Frequency | Row % | Chi-Square | P-Value |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | | | |
| Sex | | | 163.7 | <.0001 |
| Female | 3,371 | 22.8 | | |
| Male | 1,813 | 12.0 | | |
| | | | | |
| Grade | | | 17.7 | 0.0014 |
| 9th | 1,404 | 17.3 | | |
| 10th | 1,364 | 17.8 | | |
| 11th | 1,254 | 17.6 | | |
| 12th | 1,161 | 16.8 | | |
| | | | | |
| Race/ethnicity | | | 58.9 | <.0001 |
| White | 2,747 | 17.3 | | |
| Black | 579 | 14.6 | | |
| Hispanic | 429 | 14.7 | | |
| Asian | 186 | 17.6 | | |
| NHOPI[1] | 40 | 19.2 | | |
| AIAN[2] | 32 | 20.1 | | |
| Multi. Hispanic | 741 | 19.9 | | |
| Multi. non-Hispanic | 369 | 24.8 | | |
| | | | | |
| Depression | | | 5,386.7 | <.0001 |
| Yes | 4,119 | 45.1 | | |
| No | 1,095 | 5.3 | | |
| | | | | |
| Made a plan | | | 22,882.7 | <.0001 |
| Yes | 3,232 | 77.3 | | |
| No | 1,929 | 7.6 | | |
| | | | | |
| Attempted Suicide | | | 2,341.8 | <.0001 |
| Yes | 1,846 | 88.9 | | |
| No | 2,700 | 11.2 | | |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native

**Table 4C:** Bivariate analysis of suicide plan and covariates

| Variables | Weighted Frequency | Row % | Chi-Square | P-Value |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Sex | | | 140.7 | <.0001 |
| Female | 2,670 | 18.2 | | |
| Male | 1,483 | 9.8 | | |
| | | | | |
| Grade | | | 11.5 | 0.0219 |
| 9th | 1,116 | 13.9 | | |
| 10th | 1,117 | 14.8 | | |
| 11th | 993 | 14.1 | | |
| 12th | 915 | 13.4 | | |
| | | | | |
| Race/ethnicity | | | 40.0 | <.0001 |
| White | 2,094 | 13.3 | | |
| Black | 520 | 13.3 | | |
| Hispanic | 347 | 12.0 | | |
| Asian | 160 | 14.9 | | |
| NHOPI[1] | 36 | 17.8 | | |
| AIAN[2] | 25 | 15.9 | | |
| Multi. Hispanic | 618 | 16.7 | | |
| Multi. non-Hispanic | 294 | 20.0 | | |
| | | | | |
| Depression | | | 5,833.3 | <.0001 |
| Yes | 3,227 | 35.6 | | |
| No | 941 | 4.6 | | |
| | | | | |
| Suicidal Thoughts | | | 22,882.7 | <.0001 |
| Yes | 3,232 | 62.6 | | |
| No | 958 | 3.9 | | |
| | | | | |
| Attempted Suicide | | | 16,460.0 | <.0001 |
| Yes | 1,598 | 78.2 | | |
| No | 2,064 | 8.6 | | |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native

**Table 5D:** Bivariate analysis of suicide attempt and covariates

| Variables | Weighted Frequency | Row % | Chi-Square | P-Value |
|---|---|---|---|---|
| | | | | |

| | | | | |
|---|---|---|---|---|
| Sex | | | 65.0 | <.0001 |
| Female | 1,378 | 10.4 | | |
| Male | 690 | 5.3 | | |
| | | | | |
| Grade | | | 64.4 | <.0001 |
| 9th | 659 | 9.2 | | |
| 10th | 600 | 9.0 | | |
| 11th | 449 | 7.1 | | |
| 12th | 363 | 6.0 | | |
| | | | | |
| Race/ethnicity | | | 69.6 | <.0001 |
| White | 941 | 6.5 | | |
| Black | 282 | 9.3 | | |
| Hispanic | 206 | 8.3 | | |
| Asian | 66 | 6.8 | | |
| NHOPI[1] | 14 | 8.4 | | |
| AIAN[2] | 15 | 11.9 | | |
| Multi. Hispanic | 356 | 11.0 | | |
| Multi. non-Hispanic | 176 | 12.9 | | |
| | | | | |
| Depression | | | 1,753.6 | <.0001 |
| Yes | 1,687 | 20.8 | | |
| No | 390 | 2.1 | | |
| | | | | |
| Suicidal Thoughts | | | | <.0001 |
| Yes | 1,846 | 40.6 | | |
| No | 231 | 1.1 | | |
| | | | | |
| Made a plan | | | 16,469.8 | <.0001 |
| Yes | 1,598 | 43.6 | | |
| No | 445 | 2.0 | | |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native

**Table 3:** Concordance of suicidal thoughts, plan, and attempt

| | Thoughts | Plan | Attempt |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Thoughts | 100% | 77% | 90% |
| Plan | 62% | 100% | 78% |
| Attempt | 35% | 38% | 100% |

[1]Due to missing data, these numbers may not align with Tables 2B-2D

**Table 4:** Model 1 — Crude and adjusted odds ratios of depression and suicide attempt, by race/ethnicity

| Race | Crude OR | 95% CI | Adj. OR[3] | 95% CI |
|---|---|---|---|---|
| All races | 12.4 | 10.15, 15.22 | 11.9 | 9.74, 14.51 |
| White | 15.7 | 11.43, 21.48 | 14.9 | 10.89, 20.24 |
| Black | 6.5 | 4.38, 9.52 | 6.2 | 4.26, 9.11 |
| Hispanic | 14.3 | 8.08, 25.17 | 13.1 | 7.31, 23.42 |
| Asian | 17.0 | 8.43, 34.08 | 16.4 | 7.80, 34.33 |
| NHOPI[1] | 20.2 | 4.90, 83.32 | 24.5 | 4.88, 123.37 |
| AIAN[2] | 9.1 | 1.78, 46.19 | 8.8 | 1.81, 42.28 |
| Multi. Hispanic | 12.6 | 8.37, 19.00 | 12.7 | 8.39, 19.15 |
| Multi. non-Hispanic | 8.5 | 3.82, 18.85 | 8.9 | 4.45, 17.95 |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native
[3] Adjusted for sex and grade in school

**Table 5:** Model 2 — Crude and adjusted odds ratios of suicidal thoughts and suicide attempt, by race/ethnicity

| Race | Crude OR | 95% CI | Adj. OR[3] | 95% CI |
|---|---|---|---|---|
| All races | 65.6 | 47.70, 90.32 | 64.8 | 47.47, 88.48 |
| White | 93.9 | 57.76, 152.61 | 93.0 | 57.42, 150.48 |
| Black | 28.8 | 17.89, 46.49 | 29.6 | 18.12, 48.46 |
| Hispanic | 139.5 | 69.33, 280.71 | 147.3 | 74.46, 291.40 |
| Asian | 44.5 | 18.26, 108.57 | 45.4 | 19.17, 107.39 |
| NHOPI[1] | 91.0 | 17.64, 469.02 | 88.6 | 13.66, 574.88 |
| AIAN[2] | 149.6 | 33.37, 670.76 | 141.7 | 31.74, 632.67 |
| Multi. Hispanic | 70.0 | 42.11, 116.23 | 72.3 | 42.76, 122.22 |
| Multi. non-Hispanic | 49.0 | 20.43, 117.55 | 49.9 | 20.94, 118.65 |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native
[3] Adjusted for sex and grade in school

**Table 6:** Model 3 — Crude and adjusted odds ratios of suicide plan and suicide attempt, by race/ethnicity

| Race | Crude OR | 95% CI | Adj. OR[3] | 95% CI |
|---|---|---|---|---|
| All races | 39.6 | 32.94, 47.54 | 38.5 | 32.30, 45.97 |
| White | 47.5 | 36.52, 61.89 | 46.1 | 35.34, 60.21 |
| Black | 26.4 | 16.93, 41.14 | 26.0 | 16.73, 40.54 |
| Hispanic | 47.9 | 29.87, 76.70 | 42.8 | 29.86, 61.38 |
| Asian | 16.5 | 7.76, 35.148 | 16.4 | 7.64, 35.07 |
| NHOPI[1] | 19.7 | 3.73, 104.20 | 73.3 | 12.20, 440.46 |
| AIAN[2] | 58.7 | 12.59, 273.64 | 90.6 | 12.05, 680.83 |
| Multi. Hispanic | 45.4 | 31.40, 65.69 | 48.2 | 29.58, 78.64 |
| Multi. non-Hispanic | 27.4 | 12.51, 59.85 | 31.9 | 17.81, 57.00 |

[1] NHOPI: Native Hawaiian/Other Pacific Islander
[2] AIAN: American Indian/Alaska Native
[3] Adjusted for sex and grade in school

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