

Yale University

## EliScholar – A Digital Platform for Scholarly Publishing at Yale

---

Public Health Theses

School of Public Health

---

January 2023

### Prevalence And Correlates Of Suicide Ideation Among Asian American High School Students: Evidence From The 2019 Youth Risk Behavior Survey

Taylor Choe  
taylorchoe2@gmail.com

Follow this and additional works at: <https://elischolar.library.yale.edu/ysphtdl>

---

#### Recommended Citation

Choe, Taylor, "Prevalence And Correlates Of Suicide Ideation Among Asian American High School Students: Evidence From The 2019 Youth Risk Behavior Survey" (2023). *Public Health Theses*. 2238.  
<https://elischolar.library.yale.edu/ysphtdl/2238>

This Open Access Thesis is brought to you for free and open access by the School of Public Health at EliScholar – A Digital Platform for Scholarly Publishing at Yale. It has been accepted for inclusion in Public Health Theses by an authorized administrator of EliScholar – A Digital Platform for Scholarly Publishing at Yale. For more information, please contact [elischolar@yale.edu](mailto:elischolar@yale.edu).

Prevalence and correlates of suicide ideation among Asian American high school students:

Evidence from the 2019 Youth Risk Behavior Survey

Taylor Choe

Year Completed: 2023

Year Degree Awarded: 2023

Master of Public Health

Yale School of Public Health, Department of Chronic Disease Epidemiology

Advisor/Committee Chair: Dr. Ijeoma Opara

Committee Members: Dr. Mayur Desai

### **Abstract**

Asian American youth mental health is largely absent from the literature despite suicide being the leading cause of death among Asian American adolescents aged 14 -19 (high school-aged youth) from 2015 – 2020. This study aims to assess if Asian American students have a higher rate of suicide ideation compared to White students, what factors may account for a difference in suicide ideation rate if a difference is present, and if there are correlates of suicide ideation that are more salient among Asian American students compared to White students from the 2019 Youth Behavior Risk Survey. Despite a similar prevalence of suicide ideation, 19.7% of Asian American high school students and 19.3% of White students, Asian American high school students had 1.54 times the odds (1.16 – 2.05) of self-reported suicide ideation than White American high school students after adjusting for sex, academic performance, self-perception of weight, the experience of bullying, feeling sad or hopeless, any cigarette use, any marijuana use, and any illicit drug use – these characteristics had a protective effect against suicide ideation for Asian American students. In addition, significant correlates of suicide ideation for Asian American high school students were identified as feelings of sadness or hopelessness and any electronic vapor product. Due to the model minority stereotype of Asian Americans, regarded as the model of health, additional research that focuses on Asian American youth with the goal of dismantling the model minority stereotype of Asian Americans must be prioritized to more confidently conclude the correlates of suicide ideation among Asian American adolescents. Understanding the correlates of suicide among Asian American youth is essential to tailor future prevention and intervention programs to stop the increasing trend of suicide among Asian American youth.

*Keywords: Asian-American youth, suicide ideation, YRBS*

### **Acknowledgments**

Words cannot express my gratitude to Dr. Ijeoma Opara, my thesis advisor, professor, internship advisor, and principal investigator and director of SASH Lab, who has taught me immensely about the research process, community-based participatory research and has supported my academics in addition to providing immense support and opportunities to grow and enhance my skills as a public health researcher. I would also like to thank Dr. Mayur Desai for his expertise and guidance in my thesis, insight into conducting epidemiologic analyses, and the life insights he has shared with me. Thank you to Dr. Jennifer Schindler-Ruwsich, my advisor at Fairfield University, who helped me transition into public health, advocated for me, and taught me the foundations of public health that allowed me to continue my education at the Yale School of Public Health (YSPH). I want to extend my gratitude and say thank you to Dr. Shi-Yi Wang for his support, academic guidance, and advice, as well.


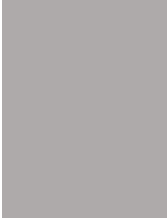
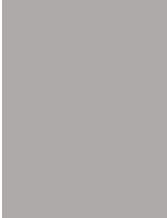
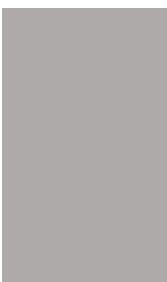
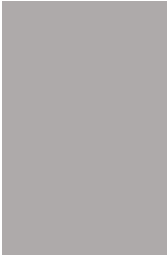
Lastly, I am grateful for the support of the friends I have made throughout the years, especially my physics major friends at Villanova University and the friends I have made at YSPH. Thank you to my omma, who has supported me unwaveringly and empowered me to pursue my dreams without inhibition, as I truly would not have been able to achieve my dreams without her support. Finally, thank you to my family, Salvatore, Colton, and Bella, for the immense love and joy in my life, being my number-one supporters, and caring for me in all the little ways each of you does.

## Table of Contents

<b>List of Tables.....</b>	<b>5</b>
<b>Introduction .....</b>	<b>15</b>
<b>Methods .....</b>	<b>16</b>
<i>Data source .....</i>	<i>16</i>
<i>Suicide Ideation.....</i>	<i>16</i>
<i>Sample Characteristics.....</i>	<i>17</i>
<i>Potential Correlates .....</i>	<i>17</i>
<i>Data analyses .....</i>	<i>20</i>
<b>Results .....</b>	<b>21</b>
<b>Discussion.....</b>	<b>24</b>
<i>Limitations.....</i>	<i>27</i>
<i>Strengths.....</i>	<i>29</i>
<b>Conclusion.....</b>	<b>30</b>
<b>References .....</b>	<b>32</b>

## List of Tables

Table 1. Description of sample; by race\*.

Characteristics	Asian (N = 610)	White (N = 6587)	p†
Sex, n (%)			0.37
Male	308 (50.7)	3201 (48.8)	
Female	300 (49.3)	3362 (51.2)	
Grade, n (%)			0.03
9 <sup>th</sup> grade	143 (23.6)	1778 (27.1)	
10 <sup>th</sup> grade	152 (25.1)	1801 (27.4)	
11 <sup>th</sup> grade	175 (28.9)	1583 (24.1)	
12 <sup>th</sup> grade	135 (22.3)	1408 (21.4)	
Description of grades in school, n (%)			<0.0001
Mostly A's	373 (64.3)	2972 (48.0)	
Mostly B's	165 (28.5)	2165 (35.0)	
Mostly C's	33 (5.7)	828 (13.4)	
Mostly D's or F's	9 (1.6)	229 (3.7)	
Self-perception of weight, n (%)			0.0004
Very underweight	25 (4.4)	129 (2.3)	
Slightly underweight	113 (19.7)	809 (14.7)	
About the right weight	281 (48.9)	2908 (52.8)	
Slightly overweight	136 (23.7)	1408 (25.6)	
Very overweight	20 (3.5)	250 (4.5)	
Weight management, n (%)			0.42
Lose weight	220 (46.7)	2280 (45.8)	
Stay the same weight or not trying to do anything about your weight	159 (33.8)	1816 (36.5)	
Gain weight	92 (19.5)	882 (17.7)	

Weight status, n (%)			<0.0001
Underweight, BMI percentile < 5%	87 (14.3)	698 (10.6)	
Healthy weight, 5% ≤ BMI percentile < 85%	429 (70.3)	4280 (65.0)	
Overweight, 85% ≤ BMI percentile < 95%	10.2 (6.7)	868 (13.2)	
Obesity, 95% ≤ BMI percentile	32 (5.3)	741 (11.3)	
Has been bullied (in-person and/or online), n (%)			<0.0001
No	508 (83.4)	4638 (70.5)	
Yes	101 (16.6)	1941 (29.5)	
Feelings of sadness or hopelessness almost every day for two weeks or more in a row, n (%)			0.06
No	413 (67.9)	4210 (64.1)	
Yes	195 (32.1)	2355 (35.9)	
Cigarettes use, n (%)			<0.0001
No use	573 (97.8)	5660 (93.2)	
Any use	13 (2.2)	412 (6.8)	
Electronic vapor products use, n (%)			<0.0001
No use	81 (13.9)	2396 (38.0)	
Any use	501 (86.1)	3914 (62.0)	
Marijuana use, n (%)			<0.0001
No use	548 (90.7)	5078 (78.2)	
Any use	56 (9.3)	1416 (21.8)	
Alcohol use, n (%)			<0.0001
No use	502 (86.1)	4169 (66.5)	
Any use	81 (13.9)	2096 (33.5)	
Illicit drug use, n (%)			0.01
No use	478 (87.2)	4572 (83.1)	
Any use	70 (12.8)	927 (16.9)	

\*Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding

† P-value for  $\chi^2$  test

Table 2. Association of suicide ideation and Asian race among Asian American and White high school students\*

Characteristics	N	n (%) suicidal ideation	Suicide Ideation			
			Unadjusted OR <sup>a</sup> (95% CI)	Model 1 <sup>b</sup>	Full Model 2 <sup>c</sup>	Reduced Model 3 <sup>d</sup>
<b>Race</b>						
White	6587	1273 (19.3)	1.00	1.00	1.00	1.00
Asian	610	120 (19.7)	1.02 (0.83 – 1.26)	1.03 (0.84 – 1.28)	1.31 (0.95 – 1.81)	1.54 (1.16 - 2.05)
<b>Sex</b>						
Male	3509	487 (13.9)	1.00	1.00	1.00	1.00
Female	3662	889 (24.3)	1.99 (1.76 – 2.25)	1.98 (1.75 – 2.24)	1.14 (0.92 – 1.42)	1.25 (1.05 – 1.50)
<b>Grade</b>						
9 <sup>th</sup> grade	1921	357 (18.6)	1.00	1.00	1.00	
10 <sup>th</sup> grade	1953	400 (20.5)	1.13 (0.96 – 1.32)	1.14 (0.97 – 1.34)	1.13 (0.87 – 1.46)	
11 <sup>th</sup> grade	1758	331 (18.8)	1.02 (0.86 – 1.20)	1.04 (0.88 – 1.23)	1.00 (0.76 – 1.33)	
12 <sup>th</sup> grade	1543	303 (19.6)	1.07 (0.90 – 1.27)	1.10 (0.92 – 1.30)	1.14 (0.86 – 1.51)	
<b>Description of grades in school</b>						
Mostly A's	3345	479 (14.3)	1.00		1.00	1.00
Mostly B's	2330	515 (22.1)	1.70 (1.48 – 1.95)		1.18 (0.95 – 1.46)	1.29 (1.07 – 1.56)
Mostly C's	861	325 (24.9)	1.98 (1.65 – 2.38)		1.06 (0.79 – 1.43)	1.16 (0.90 – 1.50)
Mostly D's or F's	238	106 (44.5)	4.81 (3.66 – 6.32)		1.87 (1.17 – 2.99)	2.35 (1.56 – 3.53)



Self-perception of weight						
Very underweight	154	47 (30.5)	2.69 (1.88 – 3.84)		1.91 (1.03 – 3.55)	1.64 (1.00 – 2.69)
Slightly underweight	922	181 (19.6)	1.49 (1.24 – 1.81)		1.31 (0.96 – 1.79)	1.22 (0.95 – 1.57)
About the right weight	3189	448 (14.1)	1.00		1.00	1.00
Slightly overweight	1544	401 (26.0)	2.15 (1.85 – 2.50)		1.94 (1.48 – 2.54)	1.72 (1.41 – 2.09)
Very overweight	270	122 (45.2)	5.04 (3.89 – 6.54)		3.52 (2.17 – 5.73)	3.11 (2.18 – 4.44)
Weight management						
Lose weight	1975	273 (13.8)	2.14 (1.83 – 2.50)		1.03 (0.80 – 1.32)	
Stay the same weight or not trying to do anything about your weight	2500	638 (25.5)	1.00		1.00	
Gain weight	974	159 (16.3)	1.22 (0.98 – 1.50)		0.97 (0.70 – 1.35)	
Weight status						
Underweight, BMI percentile < 5%	785	187 (23.8)	1.57 (1.31 – 1.88)		1.21 (0.88 – 1.67)	
Healthy weight, 5% ≤ BMI percentile < 85%	4709	782 (16.6)	1.00		1.00	
Overweight, 85% ≤ BMI percentile < 95%	930	220 (23.7)	1.56 (1.31 – 1.84)		1.07 (0.79 – 1.43)	

ASIAN AMERICAN YOUTH SUICIDE IDEATION CORRELATES

Obesity, 95% ≤ BMI percentile	773	204 (26.4)	1.80 (1.51 – 2.15)		0.92 (0.65 – 1.32)	
Has been bullied (in-person and/or online)						
No	5146	683 (13.3)	1.00		1.00	1.00
Yes	2042	705 (34.5)	3.45 (3.05 – 3.89)		1.65 (1.35 -2.02)	1.63 (1.37 – 1.95)
Feelings of sadness or hopelessness almost every day for two weeks or more in a row						
No	4623	226 (4.9)	1.00		1.00	1.00
Yes	2550	1159 (45.5)	16.21 (13.87 – 18.92)		12.43 (9.91 – 15.58)	12.62 (10.36 – 15.38)
Cigarettes use						
No use	6223	1107 (17.8)	1.00		1.00	1.00
Any use	425	173 (40.7)	3.18 (2.59 – 3.90)		1.49 (1.03 – 2.16)	1.44 (1.06 – 1.95)
Electronic vapor products use						
No use	2477	657 (26.5)	1.00		1.00	
Any use	4415	673 (15.2)	0.50 (0.44 – 0.56)		1.04 (0.81 – 1.32)	
Marijuana use						
No use	5626	908 (16.1)	1.00		1.00	1.00
Any use	1469	466 (31.7)	2.41 (2.12 – 2.75)		1.64 (1.26 – 2.13)	1.68 (1.37 – 2.06)

Alcohol use						
No use	4671	744 (15.9)	1.00		1.00	
Any use	2177	567 (26.1)	1.86 (1.64 – 2.10)		0.99 (0.78 – 1.26)	
Illicit drug use						
No use	5050	806 (16.0)	1.00		1.00	1.00
Any use	997	411 (41.2)	3.69 (3.19 – 4.28)		1.76 (1.38 – 2.25)	1.87 (1.51 – 2.30)

\* Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding.

<sup>a</sup> Univariate logistic regression models were used to estimate unadjusted odds ratios (ORs) and 95% CI for suicide ideation with Asian race

<sup>b</sup> Model 1: Adjusted for sex, and grade.

<sup>c</sup> Full Model 2: Full multivariate logistic regression model.

<sup>d</sup> Reduced Model 3: Backwards stepwise multivariate logistic regression adjusted for sex, academic performance, self-perception of weight, bullying, feelings of sadness or hopelessness, any cigarette use, any marijuana use, and any illicit drug use.

Table 3. Self-report suicide ideation, stratified by race\*

Characteristics	Self-reported suicide ideation			
	Asian (N = 610)	p†	White (N = 6587)	p†
Overall	120 (19.7)		1273 (19.3)	
Sex, n/N(%)		0.07		<0.0001
Male	51/308 (16.6)		436/3201 (13.6)	
Female	67/300 (22.3)		822/3362 (24.5)	
Grade, n/N(%)		0.80		0.44
9 <sup>th</sup> grade	30/142 (21.0)		327/1778 (18.4)	
10 <sup>th</sup> grade	31/152 (20.4)		369/1801 (20.5)	
11 <sup>th</sup> grade	30/175 (17.1)		301/1583 (19.0)	
12 <sup>th</sup> grade	28/135 (20.7)		275/1408 (19.5)	
Description of grades in school, n/N(%)		0.03		<0.0001
Mostly A's	61/373 (16.4)		418/2972 (14.1)	
Mostly B's	41/165 (24.9)		474/2165 (21.9)	
Mostly C's	8/33 (24.2)		206/828 (24.9)	
Mostly D's or F's	4/9 (44.4)		102/229 (44.5)	
Self-perception of weight, n/N(%)		0.14		<0.0001
Very underweight	6/25 (24.0)		41/129 (31.8)	
Slightly underweight	21/113 (18.6)		160/809 (19.8)	
About the right weight	49/281 (17.4)		399/2908 (13.7)	
Slightly overweight	30/136 (22.1)		371/1408 (26.4)	
Very overweight	8/20 (40.0)		114/250 (45.6)	
Weight management, n/N(%)		0.08		<0.0001
Lose weight	53/220 (24.1)		585/2280 (25.7)	

Stay the same weight or not trying to do anything about your weight	24/159 (15.1)		249/1816 (13.7)	
Gain weight	16/92 (17.4)		143/882 (16.2)	
Weight status, n/N (%)		0.99		<0.0001
Underweight, BMI percentile < 5%	18/87 (20.7)		169/698 (24.2)	
Healthy weight, 5% ≤ BMI percentile < 85%	84/429 (19.6)		698/4280 (16.3)	
Overweight, 85% ≤ BMI percentile < 95%	12/62 (19.4)		208/868 (24.0)	
Obesity, 95% ≤ BMI percentile	6/32 (18.8)		198/741 (26.7)	
Has been bullied (in-person and/or online), n/N (%)		0.0001		<0.0001
No	86/508 (16.9)		597/4638 (12.9)	
Yes	34/101 (33.7)		671/1941 (34.6)	
Feelings of sadness or hopelessness almost every day for two weeks or more in a row, n/N(%)		<0.0001		<0.0001
No	40/413 (9.7)		186/4210 (4.4)	
Yes	79/195 (40.5)		1080/2355 (45.9)	
Cigarettes use, n/N(%)		0.0001		<0.0001
No use	107/573 (18.7)		1000/5660 (17.7)	
Any use	8/13 (61.5)		165/412 (40.1)	
Electronic vapor products use, n/N(%)		<0.0001		<0.0001
No use	30/81 (37.0)		627/2396 (26.2)	
Any use	82/501 (16.4)		591/3914 (15.1)	

Marijuana use, n/N(%)		0.005		<0.0001
No use	100/548 (18.3)		808/5078 (15.9)	
Any use	19/56 (33.9)		447/1413 (31.6)	
Alcohol use, n/N(%)		0.03		<0.0001
No use	91/502 (18.1)		653/4169 (15.7)	
Any use	23/81 (28.4)		544/2096 (26.0)	
Illicit drug use, n/N(%)		0.001		<0.0001
No use	84/478 (17.6)		722/4572 (15.8)	
Any use	24/70 (34.3)		387/927 (41.8)	

\*Numbers may not sum to totals due to missing data, and column percentages may not sum to 100% due to rounding

† P-value for  $\chi^2$  test, Fisher's exact

Table 4. Correlates of self-reported suicide ideation, stratified by race <sup>a</sup>

Correlates	Reduced model for each	
	Asian (n = 610)	White (n = 6587)
Female		1.31 (1.09 – 1.57)
Description of grades in school		
Mostly A's		1.00
Mostly B's		1.34 (1.11 – 1.63)
Mostly C's		1.31 (1.02 – 1.69)
Mostly D's or F's		2.48 (1.67 – 3.68)
Self-perception of weight		
Very underweight		1.71 (0.99 – 2.95)
Slightly underweight		1.25 (0.95 – 1.64)
About the right weight		1.00
Slightly overweight		1.76 (1.43 – 2.16)
Very overweight		3.58 (2.45 – 5.24)
Experienced bullying (in-person and/or online)		1.68 (1.41 – 2.01)
Felt sad or hopeless almost every day for two weeks or more in a row	6.61 (4.17 – 10.48)	12.64 (10.33 – 15.48)
Any electronic vapor products use	0.47 (0.27 – 0.82)	
Any marijuana use		1.57 (1.29 – 1.90)
Any illicit drug use		2.09 (1.70 – 2.57)

<sup>a</sup> Backwards stepwise multivariate logistic regression models were utilized to estimate odds ratios (ORs) and 95% CI for correlates of self-reported suicide ideation

## **Introduction**

More than one in three high school students experienced persistent sadness or hopelessness in 2019, a forty percent increase since 2009, and one in five seriously considered suicide (Centers for Disease Control (CDC), n.d.). The majority of adolescent suicide research is centered around white adolescents. In recent years, there has been a focus on racial minority mental health and suicide, though much of the research is focused on Black and Latino youth. However, Asian American youth mental health is largely absent from the literature despite suicide being the leading cause of death among Asian American adolescents aged 14 -19 (high school-aged youth) from 2015 – 2020; compared to all the other racial and ethnic groups of youth, suicide was either the second or third leading cause of death (CDC's WISQRS). While one suicide death is one too many within any racial and ethnic youth group, there are efforts to investigate and research what drives those deaths. Though research efforts for minority youth such as Black and Latino youth are more recent, it is currently recognized, and literature is emerging; however, Asian American adolescents are largely absent despite the clear need for more research to understand the suicide of these youth.

Known factors that contribute to suicide risk are a history of depression or other mental illness, substance use, bullying, discrimination, and stigma associated with help-seeking and mental illness, with suicide ideation being a warning sign of suicide (CDC, 2022). However, little is known about suicidal ideation among Asian American adolescents. High school is a time when adolescents may be vulnerable to poor mental health from a multitude of factors, which may lead to suicide ideation, which then could lead to suicide. High school students have issues that can affect them negatively, such as grades, body image and weight, bullying, feelings of sadness or hopelessness, and substance use. Additional research is needed to understand what



drives suicide among Asian American adolescents, to be able to identify intervention points, such as when Asian Americans have suicidal ideation, and to have tailored-relevant interventions.

This study aims to assess (1) if Asian American students have a higher rate of suicide ideation compared to White students, (2) what factors may account for a difference in suicide ideation rate if a difference is present, and (3) if there are correlates of suicide ideation that are more salient among Asian American students compared to White students.

## **Methods**

### *Data source*

The CDC's Youth Risk Behavior Surveillance System (YRBSS) is a school-based survey of representative samples of 9<sup>th</sup> – 12<sup>th</sup>-grade students in the United States conducted every two years and was created to monitor health risk behaviors contributing to the leading causes of death, disability, and social problems of youth. The survey is typically administered in the spring semester. A three-stage cluster sample design was utilized to achieve a representative sample of high school students; For more information on the methods, the CDC publishes their methods of the YRBSS. For this study, the 2019 YRBS data were utilized.

### *Suicide Ideation*

Suicide ideation is the primary outcome variable of interest and was measured by the question, "During the past 12 months, did you ever **seriously** consider attempting suicide?" Answer options were "Yes" or "No."

### *Sample Characteristics*

Race was measured by the question, "What is your race?" and answer options were "American Indian or Alaska Native," "Asian," "Black or African American," "Native Hawaiian or other Pacific Islander," and "White," and more than one option can be selected. For analyses of this study, any students that answered "Asian" solely and "White" solely were included in the analysis.

Grade level was measured by the question, "What grade are you?" Answer options were "9<sup>th</sup> grade," "10<sup>th</sup> grade," "11<sup>th</sup> grade," "12<sup>th</sup> grade," or "ungraded or other grade." For analyses, grade was restricted to 9<sup>th</sup>-12<sup>th</sup> grade to obtain meaningful results for high school students. Sex was measured by the question, "What is your sex?" Answer options were "Male" or "Female."

### *Potential Correlates*

#### Academic performance

Participants' academic performance was measured by the question, "During the past 12 months, how would you describe your grades in school?" with the answer options of "Mostly A's," "Mostly B's," "Mostly C's," "Mostly D's," "Mostly F's," "None of these grades," and "Not sure." Analyses were restricted to the distinctive letter grade options, as "none of these grades" and "not sure" does not provide meaningful results about academic performance's correlation to suicide ideation. In both Asian and White students, there were a small number of both groups that described their grades as "Mostly D's" or "Mostly F's" and thus were combined into one category, "Mostly D's or F's," to showcase those that had the worse grades were and if suicide ideation was associated with poorer grades.

## Weight/BMI

Participants' self-perception of weight was measured by the question, "How do **you** describe your weight?" with the answer options "Very underweight," "Slightly underweight," "About the right weight," "Slightly overweight," and "Very overweight." Participants' weight maintenance was measured by the question, "Which of the following are you trying to do about your weight?" with the answer options, "**Lose** weight," "**Gain** weight," "**Stay** the same weight," and "I am **not trying to do anything** about my weight." For the analysis, "**Stay** the same weight" and "I am **not trying to do anything** about my weight" were combined into one category, as those are similar within the context of looking at weight maintenance that they are not actively trying to lose or gain weight. Participants were asked to report their height in feet and inches and weight in pounds. The CDC then calculated BMI and the BMI percentile. Then participants were categorized into the following BMI categories: underweight (BMI percentile < 5%), healthy weight ( $5\% \leq$  BMI percentile < 85%), overweight ( $85\% \leq$  BMI percentile < 95%), obesity ( $95\% \leq$  BMI percentile).

## Bullying and Mental Health

A definition of bullying was provided in an excerpt before the bullying questions. The definition was as follows, "Bullying is when 1 or more students tease, threaten, spread rumors about, hit, shove, or hurt another student over and over again. It is not bullying when 2 students of about the same strength or power argue or fight or tease each other in a friendly way." Two questions ascertained bullying, "During the past 12 months, have you ever been bullied **on school property**?" and "During the past 12 months, have you been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)" Both questions have

the answer options "Yes" or "No." Bullying was combined into one variable; if both bullying questions were answered "Yes" or either was answered "Yes," then students would be categorized as having been bullied (in-person and/or online). Participants had to answer "No" to both questions to be categorized as having not been bullied.

Feelings of sadness or hopelessness were ascertained by 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?" with the answer options of, "Yes" or "No."

### Drug Use

Any or no cigarette use was ascertained by the question, "During the past 30 days, on how many days did you smoke cigarettes?" with anyone answering more than "0 days" categorized as having any cigarette use, and those who did not have any use in the past 30 days as no cigarette use. Any electronic vapor product use was measured by the question, "During the past 30 days, how many days did you use an electronic vapor product?" with any participant answering more than "0 days" categorized as any electronic vapor product use. Any or no marijuana use was measured by the question, "During the past 30 days, how many days did you use marijuana?" with any participant answering more than "0 days" categorized as marijuana use, and those that had "0 days" as no marijuana use. Any or no alcohol use was measured by the question, "During the past 30 days, on how many did you have at least one drink of alcohol" anyone that answered "0 days" was categorized as having no alcohol use. Any answer greater than "0 days" was categorized as any alcohol use. Due to the large majority of participants having no use of the various drugs under study, thus the individual groups of categorizations had

too few participants within each answer option, so drug use of cigarettes, electronic vapor products, marijuana, and alcohol were created into binary, any/no use.

The no illicit drug use was created if "0 times" was answered for all of the following questions: "During your life, how many times have you taken **prescription pain medicine** without a doctor's prescription or differently than how a doctor told you to use it?", "During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?", "During your life, how many times have you used **heroin** (also called smack, junk, or China White)?", "During your life, how many times have you used **methamphetamines** (also called speed, crystal meth, crank, ice, or meth)? and "During your life, how many times have you used **ecstasy** (also called MDMA)?" Participants were categorized as any illicit drug use if they answered that they had used any of the mentioned drugs above one or more times in the listed questions. The number of participants that had any use of illicit drug use was low across every drug, and for analyses, the association of a particular drug and suicide ideation is not the main focus, but instead, its illicit drug use as a whole is associated with suicide ideation.

### *Data analyses*

This study analyzed (1) if Asian American students have a higher rate of suicide ideation compared to White students, (2) what factors may account for a difference in suicide ideation rate if a difference is present, and (3) if there are correlates of suicide ideation that are more salient among Asian American students compared to White students. The comparison race group is White high school students due to being the largest group, in addition, to most traditional youth suicide-related research being conducted in predominately White youth samples.

Descriptive statistics were reported for the characteristics and potential correlates under the study of the sample by race, where  $\chi^2$  tests for binary and categorical variables were also performed.

Univariate logistic regression was utilized to estimate the unadjusted odds ratios (ORs) of suicide ideation and study correlates of suicide ideation among Asian American high school students compared to White high school students. Model 1 adjusted for demographic variables of the students, sex, and grade. Full Model 2 is the full multivariable logistic regression model with all the potential correlates of suicide ideation in the model. The Reduced Model 3 was a backward stepwise multiple logistic regression adjusted for sex, academic performance, self-perception of weight, bullying, feelings of sadness or hopelessness, any cigarette use, any marijuana use, and any illicit drug use.

Descriptive statistics of the correlates under study by suicide ideation stratified by the racial group were reported separately, where  $\chi^2$  tests for binary and categorical variables and Fisher's exact test for binary or categorical variables containing cells containing less than five observations were performed. Backwards stepwise logistic regression was utilized to obtain the final reduced models stratified by racial group. All statistical analyses were performed in SAS (version 9.4).

## Results

The sample of students from the 2019 YRBS included 610 Asian high school students and 6587 White high school students. *Table 1* is the description of the sample by race. Significant associations existed between the following potential correlates of suicide ideation and race: grade, academic achievement, self-perception of weight, BMI percentile, having been bullied, and any drug use (cigarette, electronic vapor products, marijuana, alcohol, and illicit drugs).

*Table 2* shows the multivariable logistic regression model of correlates associated with suicide ideation for Asian American high school students. The unadjusted OR for Asian American high school students was 1.02 (0.83 – 1.26) times the odds of suicide ideation compared to White high school students. For Model 1, which adjusted for demographic characteristics, there was no significant increase in the odds of suicide ideation for Asian American high school students. For the Full Model 2, all potential correlates of suicide ideation were put into the model. Asian American high school students became 1.31 (0.95 – 1.81) times the odds of having suicidal ideation compared to White high school students. However, the OR was not significant. In the final reduced model, adjusted for sex, academic performance, self-perception of weight, bullying, feelings of sadness or hopelessness, any cigarette use, any marijuana use, and any illicit drug use, Asian American high school students had 1.54 (1.16 (2.05) times the odds of suicide ideation compared to White high school students.

*Table 3* shows the associations between the correlates under study by suicide ideation stratified by race. The sample of Asian students had 120 (19.7%) participants that had self-reported suicide ideation; White students had 1273 (19.3%) participants that reported suicidal ideation. There was no significant association between sex, grade, self-perception of weight, weight management, and weight status and suicidal ideation among Asian American high school students. 41 (24.9%) Asian American students had mostly B's, 8 (24.2) had mostly C's, and 4 (44.4%) had mostly D's or F's and was significantly associated ( $p = 0.03$ ) with suicide ideation. 34 (33.7%) Asian American students that have been bullied had suicidal ideation and were associated ( $p = 0.0001$ ) with suicide ideation significantly. Of the Asian American students with extended sadness or hopelessness, 40.5% had suicide ideation ( $p < 0.0001$ ). Drug usage

(cigarette, electronic vapor products, marijuana, alcohol, and illicit drug) was significantly associated with suicidal ideation.

There was no significant association between grade and suicidal ideation among White high school students. Of White female students, 24.5% of female students had suicidal ideation. White students had mostly B's, 21.9%, among those with mostly C's, 24.9%, and 44.5% with mostly D's or F's had suicidal ideation. Those with a very underweight or very overweight perception of their weight had the highest number of suicidal ideation. Among those trying to lose weight, 25.7% had suicidal ideation. Among those White students that had been bullied, 34.6% of them had suicidal ideation, and among those who had feelings of sadness or hopelessness, 45.9% had suicidal ideations.

*Table 4* includes the correlates of suicide ideation stratified by race. Among Asian students, feelings of sadness or hopelessness and electronic vapor product usage were salient covariates of suicide ideation. White students also had feelings of sadness or hopelessness, in addition to poorer grades, extreme self-perception of weight, being very underweight, very overweight, having been bullied, any marijuana use, and illicit drug use, but did not have electronic vapor products use as a correlate of suicidal ideation. Feelings of sadness or hopelessness increased the risk in both Asian American and White youth. However, it is more strongly associated with suicide ideation among White students (OR = 12.64) than among Asian American students (OR = 6.61). In addition, electronic vapor products were a protective factor in Asian Americans (OR = 0.47), compared to White students, where any electronic vapor product use was not correlated with suicide ideation.



## Discussion

Looking at the description of the Asian and White high school sample, there are some key differences in academic performance, self-report of having been bullied, and electronic vapor product use. Overall, more than half of the Asian American students had mostly A's (64.3%) compared to White students (48%) (*Table 1*). The greater number of Asian American students that were high achieving could be due to the Asian cultural expectation and parental pressure to excel in school. Thus, more emphasis and support may be placed on students' academics compared to their White peers. Nevertheless, it can also be a source of stress regardless if the student is a high-achieving academic performer, where they may feel a high burden to excel in school, as this is seen as their role within the family (Kramer et al., 2002). However, in the Reduced Model 3 (*Table 2*), the risk of suicide ideation increased after adjusting for academic performance and other significant correlates of suicide ideation, showing that academic performance, where the majority of Asian American students in the sample, are performing at a high level has a protective effect for Asian American students in regards to suicide ideation.

29.5% of White high school students were bullied compared to 16.6% of Asian American high school students. A study found that there were ethnic and gender differences in the way that children report being a victim of "bullying" on self-reported measures (Sawyer et al., 2008). Despite defining bullying before the question in the 2019 YRBS, Asian American students may have had more instances of racialized bullying, and they may not have identified as "tease[ing], threaten[ing to] spread rumors about, hit[ting], shov[ing], or hurt[ing] another student over and over again." However, they may not have considered it "bullying" but acts of racism or

discrimination. Thus, they may have different events affecting their mental health that were not accounted for within the 2019 YRBS questions.

And finally, while electronic vapor product usage is high in both racial groups, 86.1% of Asian American high school students, compared to 62.0% of White high school students, reported any electronic vapor product usage. Previous studies have found a similar difference regarding electronic vapor product usage among racial groups. However, there is limited research as to the cause of the differences. In addition, in the stratified analysis by race of the correlates of suicide ideation, any electronic vapor product use had a protective effect among Asian American students, where those who had any electronic vapor use had 0.47 (0.27-0.82) times the odds of suicidal ideation compared to those who had no electronic vapor use. In a study that examined the psychographics of interests of adolescent vape users where those in the study reported a high prioritization of fitting in socially (Stalgaitis et al., 2020), where those youth that was engaging in electronic vapor product usage may be engaging in social situations, where they feel more connected with their peers. Because of this shared activity, those who use electronic vapor products may have less social isolation and thus accounting for the protective effect of electronic vapor product use. In contrast, youth who do not vape may be the students with social isolation, which in turn may have an increased risk of suicide (CDC, 2022); further research must be done on electronic vapor product use and suicide and if there is an association.

There are also interesting trends with self-perception of weight, weight management, and weight status among both racial groups of youth. The majority of both Asian and White students perceived themselves to be about the right weight, 48.9% and 52.8%; however, the majority of students, when asked what there was there weight management, the majority were trying to lose weight, 46.7% of Asian students and 45.8% white students, where only about a third of both

racial group students were trying to stay the same weight. The majority of Asian American youth (70.3%) and White youth (65.0%) were a healthy weight, 14.3% of Asian American youth were underweight, and 10.6% of White youth were underweight. It is important to note that there was a substantial amount of missing data for the self-perception of weight question and even more missing for the weight management question. The missing may be due to weight being a sensitive subject to many youths, and participants may not have felt comfortable answering the question. Despite the missing data, the apparent trend is alarming, and a similar trend was found (Bhurtun & Jeewon, 2013). Though this trend was across both racial groups, the underlying causes of this issue may stem differently, where the intersection of Asian and American cultures may affect Asian American youth's mental health overall, where the identification where these weight perceptions and weight management practices stem from will be vital for effective prevention and intervention creation and dissemination.

The sample of Asian and White youth from the YRBS are similar, yet have some distinct differences with respect to the correlates of suicide ideation understudy. However, the sample had a similar prevalence of suicide ideation. 19.7% of Asian American high school students had self-reported suicide ideation; similarly, 19.3% of White American high school students participants reported suicidal ideation. Despite having a similar prevalence of self-report suicide ideation, Asian American high school students had 1.54 (1.16 – 1.05) times the odds of suicide ideation compared to their White American high school peers after adjusting for the female sex, academic performance, self-perceptions of weight, being bullied, feelings of sadness or hopelessness, any cigarette use, any marijuana use, and any illicit drug use. Due to the increase in the risk after adjustment, the adjusted covariates of suicide ideation in the Reduced Model 3 (*Table 3*) have a protective effect on suicide ideation among Asian American students.

Among Asian students, feelings of sadness or hopelessness and electronic vapor product usage were salient covariates of suicide ideation (*Table 4*). White students also had feelings of sadness or hopelessness, in addition to poorer grades, extreme self-perception of weight, being very underweight, very overweight, having been bullied, any marijuana use, and illicit drug use, but did not have electronic vapor products use as a correlate of suicidal ideation.

### *Limitations*

Limitations of the study are the coarse categorization of race, the small number of events for suicide ideation and levels of correlates within the sample, and unable to assess the relationship between risk factors and cultural influences for the Asian American youth. Asian races are often combined and considered a monolith with similar cultures and values. However, the race category of "Asian" and the term Asian American encompasses a diverse group of people with varying cultures, histories, and views of mental health (Leong et al., 2007); while there are similarities, having such a coarse categorization of the Asian race as singular race, will lose the nuances and effects of the different Asian cultures of the youth and the intersection it has with American culture thus not being able to get a complete understanding of the factors that impact their mental health.

Due to the small number of events of suicide ideation with the correlates under study and missing data from participant nonparticipation of not answering specific questions, cell sizes became small. As a result, many confidence intervals are large when looking at correlates of suicide ideation among Asian high school students, which show unstable estimates of ORs and cannot accurately estimate the risk of Asian high school students with regard to the correlates. Characteristics of participants such as sex, age, and grade had little missing data with respect to

the outcome variable of suicide ideation. However, for academic performance, among Asian American participants, there was minimal missing data; however, cell sizes for mostly C's and mostly D's or F's are small, and thus 95% confidence intervals are large, and OR estimates are unstable. However, OR estimates were more stable for White high school students as missing data was minimal. Despite the unstable OR for academic performance among mostly Asian American students, the general trend is that low academic performance in both Asian and White students has the highest increased odds of suicide ideation compared to those who had mostly A's.

A similar situation arises for self-perception of weight, bullied, sad, any use of cigarettes, any use of electronic vapor products, any use of marijuana, any use of alcohol, and any use of illicit drugs where there was missing data. Those that experienced the outcome with respect to the risk factor under interest were small, which resulted in unstable OR estimates and large confidence intervals among both racial groups. However, weight maintenance in both Asian American and White participants had a large amount of missing data, in addition to a small amount of those that experienced suicide at the various categories of weight maintenance, which produces insignificant, unstable ORs for Asian Americans and White students of suicide ideation compared to the gain weight management group.

The analysis overall depicts Asian American youth as having protective factors. However, Asian American youth have a unique experience from their White peers and other minority youth due to the model minority stereotype (MMS), where Asian Americans are often considered prosperous and not needing attention or help (Kim et al., 2021). In order to dismantle the MMS, researchers must analyze and consider if their data and results meaningfully support that Asian Americans are the model minority in health (Kim et al., 2021). With this analytical

lens to help contextualize the findings of this study, the YRBS is secondary data where the primary goal of the survey is to assess health-risk behaviors that impact youth health more broadly. The questions on the survey do not consider the complex factors present in Asian American adolescents' lives. The unique intersectionality of American and Asian cultures of youths' families is not studied. There is an intersectionality of cultures for many Asian American youth, where often Asian American youth are trying to find the balance of existing in a world where their family's Asian culture may dominate their home life. However, the outside world around them is a different culture. Traditional Asian values place a great value on the family unit, with clear roles and functions, and serve more significant greater needs of the family as a unit (Kramer et al., 2002). Many Asian values place significant importance on education and view the role of children to achieve high education attainment and excel in academic performance; that is seen as their role within the family. In addition, many Asian cultures have various beliefs regarding mental illness, but in most Asian cultures, it is stigmatized (Kramer et al., 2002). With these interplaying factors, there may be complex feelings of burden and the inability to identify or express them. Due to the severe lack of research on the cultural influences on the mental health of Asian American youth, there needs to be additional research that focuses on Asian American youth and creates validated questions that can ascertain these cultural impacts on mental health among Asian American adolescents.

### *Strengths*

The strengths of this study are generalizability, a wide range of potential correlates that were assessed for Asian American high school-aged youth, and a preliminary study to provide some insight possible impact of the intersectionality of Asian and American culture of Asian

American youth identity. Due to the study design, the results from the 2019 YRBS data are generalizable to the US high school population, specific to this study Asian and White high school students. The results of this study can be used as the starting point to test specific hypotheses about certain correlates of suicide ideation among Asian American high school students. In addition, there are many unstable and insignificant ORs of Asian American high school students with increased odds of suicide ideation compared to White American high school students. However, these results may be replicated in a study of more Asian American youth participants to increase the statistical power.

## **Conclusion**

This study assesses (1) if Asian American students have a higher rate of suicide ideation compared to White students, (2) what factors may account for a difference in suicide ideation rate if a difference is present, and (3) if there are correlates of suicide ideation that are more salient among Asian American students compared to White students from the 2019 YRBS. The sample of Asian and White youth from the YRBS are similar, yet have some distinct differences with respect to the correlates of suicide ideation understudy. The sample had a similar prevalence of suicide ideation: 19.7% of Asian American high school students and 19.3% of White high school students had self-reported suicide, and despite having a similar prevalence of self-report suicide ideation, Asian American high school students had 1.54 (1.16 – 2.05) times the odds of suicide ideation compared to their White high school peers after adjusting for the female sex, academic performance, self-perceptions of weight, being bullied, feelings of sadness or hopelessness, any cigarette use, any marijuana use, and any illicit drug use. In addition, significant correlates of suicide ideation for Asian American high school students were identified

as feelings of sadness or hopelessness and any electronic vapor product; White high school students also had feelings of sadness or hopelessness, in addition to the female sex, poorer grades, experienced online or in-person bullying, any marijuana use, and any illicit drug use as significant correlates of suicide ideation.; however, due to the limited number of participants that had suicide ideation among Asian Americans, there was a small number of events. Thus, confidence intervals are large, which show unstable estimates of odds ratios for many correlates among Asian American high school students. Due to the severe lack of research on the cultural influences on the mental health of Asian American youth, there needs to be additional research that focuses on Asian American youth and creates validated questions that can ascertain these cultural impacts on mental health among Asian American adolescents, with the goal of dismantling the model minority stereotype of Asian Americans. Understanding the correlates of suicide among Asian American youth is essential to tailor future prevention and intervention programs to stop the increasing trend of suicide among Asian American youth.



## References

- Bhurtun, D. D., & Jeewon, R. (2013). Body Weight Perception and Weight Control Practices among Teenagers. *ISRN Nutr*, 2013, 395125. <https://doi.org/10.5402/2013/395125>
- Brady, J. L., Kaya, A., Iwamoto, D., Park, A., Fox, L., & Moorhead, M. (2017). Asian American Women's Body Image Experiences: A Qualitative Intersectionality Study. *Psychology of Women Quarterly*, 41(4), 479-496. <https://doi.org/10.1177/0361684317725311>
- Centers for Disease Control and Prevention. (n.d.) Youth risk behavior survey: data summary & trends report 2009-2019. <https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBSDataSummaryTrendsReport2019-508.pdf>
- Centers for Disease Control and Prevention. 2022. Suicide Prevention: Risk and Protective Factors. [Online]. <https://www.cdc.gov/suicide/factors/index.html> Accessed on March 23, 2022.
- Centers for Disease Control and Prevention. 2019 Youth Risk Behavior Survey Data. Available at: [www.cdc.gov/yrbs](http://www.cdc.gov/yrbs). Accessed on December 10, 2022.
- Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. Accessed on March 30, 2023.
- Huynh, J., Chien, J., Nguyen, A. T., Honda, D., Cho, E. E., Xiong, M., Doan, T. T., & Ngo, T. D. (2022). The mental health of Asian American adolescents and young adults amid the rise of anti-Asian racism. *Front Public Health*, 10, 958517. <https://doi.org/10.3389/fpubh.2022.958517>

- Kim, J. J. , Lu, Q. & Stanton, A. L. (2021). Overcoming Constraints of the Model Minority Stereotype to Advance Asian American Health. *American Psychologist*, 76 (4), 611-626. doi: 10.1037/amp0000799.
- Kramer, E. J., Kwong, K., Lee, E., & Chung, H. (2002). Cultural factors influencing the mental health of Asian Americans. *West J Med*, 176(4), 227-231.
- Leong, F. T. L., Leach, M. M., Yeh, C., & Chou, E. (2007). Suicide among Asian Americans: What Do We Know? What Do We Need to Know? *Death studies*, 31(5), 417-434. <https://doi.org/10.1080/07481180701244561>
- Miller, M. J., Yang, M., Farrell, J. A., & Lin, L.-L. (2011). Racial and Cultural Factors Affecting the Mental Health of Asian Americans. *American journal of orthopsychiatry*, 81(4), 489-497. <https://doi.org/10.1111/j.1939-0025.2011.01118.x>
- Njoroge, W. F. M., Forkpa, M., & Bath, E. (2021). Impact of Racial Discrimination on the Mental Health of Minoritized Youth. *Current Psychiatry Reports*, 23(12), 81. <https://doi.org/10.1007/s11920-021-01297-x>
- Sawyer, A. L., Bradshaw, C. P., & O'Brennan, L. M. (2008). Examining Ethnic, Gender, and Developmental Differences in the Way Children Report Being a Victim of "Bullying" on Self-Report Measures. *Journal of Adolescent Health*, 43(2), 106-114. <https://doi.org/https://doi.org/10.1016/j.jadohealth.2007.12.011>
- Sims, G. M., Kia-Keating, M., Sanchez, A., & Beylin, N. (2022). Anti-Asian American Discrimination and COVID-19. *International perspectives in psychology : research, practice, consultation*, 11(3), 206-213. <https://doi.org/10.1027/2157-3891/a000048>
- Stalgaitis, C. A., Djakaria, M., & Jordan, J. W. (2020). The Vaping Teenager: Understanding the Psychographics and Interests of Adolescent Vape Users to Inform Health Communication

Campaigns. *Tob Use Insights*, 13, 1179173x20945695.

<https://doi.org/10.1177/1179173x20945695>

Substance Abuse and Mental Health Services Administration US Department of Health and Human Services. (2018). 2018 National survey on drug use and health: Asians/Native Hawaiians and other Pacific Islanders (NHOPI).

[https://www.samhsa.gov/data/sites/default/files/reports/rpt23248/3\\_Asian\\_NHOPI\\_2020\\_01\\_14.pdf](https://www.samhsa.gov/data/sites/default/files/reports/rpt23248/3_Asian_NHOPI_2020_01_14.pdf)

Turecki, G., Brent, D. A., Gunnell, D., O'Connor, R. C., Oquendo, M. A., Pirkis, J., & Stanley, B. H. (2019). Suicide and suicide risk. *Nature Reviews Disease Primers*, 5(1), 74.

<https://doi.org/10.1038/s41572-019-0121-0>

US Census Bureau 2017 National Population Projections Tables: Main Series. United States

Census Bureau. [(accessed on 3 May 2021)];2017 Available online:

<https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html> [Ref list]

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E., Jr. (2010). The interpersonal theory of suicide. *Psychol Rev*, 117(2), 575-600.

<https://doi.org/10.1037/a0018697>

Wyatt, L. C., Ung, T. P., Park, R., Kwon, S. C., & Trinh-Shevrin, C. D. (2015). Risk Factors of Suicide and Depression among Asian American, Native Hawaiian, and Pacific Islander Youth: A Systematic Literature Review. *Journal of Health Care for the Poor and Underserved*, suppl. Supplement, 26(2), 191-237.

<https://doi.org/https://doi.org/10.1353/hpu.2015.0059>

Zou, P., Siu, A., Wang, X., Shao, J., Hallowell, S. G., Yang, L. L., & Zhang, H. (2021).

Influencing Factors of Depression among Adolescent Asians in North America: A Systematic Review. *Healthcare (Basel)*, 9(5), 537.

<https://doi.org/10.3390/healthcare9050537>