

## Ethnicity Modifies the Additive Effects of Anxiety and Drug Use Disorders on Suicidal Ideation among Black Adults in the United States

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### ABSTRACT

**Background:** This study aimed to test if ethnicity moderates the additive effects of lifetime psychiatric disorders on serious suicidal thoughts among a nationally representative sample of Black adults in the United States.

**Methods:** For this study, we used data of 5,181 Black adults (3,570 African Americans and 1,621 Caribbean Blacks) who participated in the National Survey of American Life, 2001-2003. Five lifetime psychiatric disorders (i.e., major depressive disorder, general anxiety disorder, post-traumatic stress disorder, alcohol abuse disorder, and drug abuse) were considered as the independent variables. Lifetime serious suicidal ideation was considered as the dependent variable. Logistic regressions were used to determine if ethnicity modifies the effects of each psychiatric disorder on serious suicide ideation. Ethnicity was conceptualized as the possible moderator and socio-demographics (i.e., age, gender, education level, employment, marital status and country region) were control variables.

**Results:** Among African Americans, major depressive disorder, general anxiety disorder, post-traumatic stress disorder and alcohol abuse disorder were associated with higher odds of suicidal thoughts. Among Caribbean Blacks, major depressive disorder and drug abuse disorder were associated with higher odds of suicidal thoughts. In the pooled sample, there was a significant interaction between ethnicity and anxiety disorder and a marginally significant interaction between ethnicity and drug abuse.

**Conclusions:** Based on our study, suicidality due to psychiatric disorders among Black adults in the United States may depend on ethnicity. General anxiety disorder seems to be a more important risk factor for suicidal ideation among African Americans while drug abuse may contribute more to the risk of suicidal thoughts among Caribbean Blacks.

**Keywords:** Anxiety, drug use, ethnicity, race, suicide

### INTRODUCTION

Although traditionally, suicide was believed to be a more crucial public health problem for Whites, recent literature

suggests a rapid rise in suicide rate among Blacks.<sup>[1-3]</sup> According to a recent report, Blacks may experience similar rates of suicide attempts as Whites.<sup>[4]</sup> As suicide presents at a younger age among Black populations, less time is available for prevention of suicide among Black.<sup>[5]</sup>

Although we know that suicide rates vary among ethnic groups,<sup>[6-8]</sup> very few studies have explored how ethnicity shapes risk and protective factors of suicide among Blacks in the United States.<sup>[9,10]</sup> Different culture, life values and socio-historical experiences may result in differences in the rate and pattern of suicide among various ethnic groups.<sup>[11]</sup> However, understanding of ethnic specific pathways that lead to suicide among Blacks requires further research.

Joe *et al.* showed that African Americans are five times more likely to attempt suicide than Caribbean Blacks.<sup>[10]</sup> Another study by Joe *et al.* also studied the contribution of psychiatric disorders to suicide attempts among Blacks.<sup>[9]</sup> However, these studies did not compare African Americans and Caribbean Blacks for the role of each psychiatric disorder on suicidality.

From the long list of risk factors of suicide,<sup>[12-14]</sup> psychiatric disorders are possibly the strongest one.<sup>[15-19]</sup> A systematic review showed that almost 98% of individuals who commit suicide endorse a clinical diagnosis of psychiatric disorder. Based on the literature, although most psychiatric disorders increase the chance of suicide, mood disorders (accounting for 30% of suicides), followed by substance-use related disorders (18% of suicides) possibly contribute more than other mental disorders.<sup>[20,21]</sup>

The current study aimed to test if ethnicity moderates the effect of lifetime psychiatric disorders on lifetime suicidal ideation among a nationally representative sample of Black Americans.

## METHODS

Data came from the National Survey of American Life (NSAL), which was conducted as part of the Collaborative Psychiatric Epidemiology Surveys. The NSAL is comprised of national household surveys collected from 3,570 African Americans, 1,621 Caribbean Blacks and 891 non-Hispanic White adults. African Americans samples, being the largest portion of NSAL, were

selected from 48 neighboring states and included households that contained at least one Black adult. The Caribbean Blacks sample included 265 samples that were collected from households within the core sample. The remaining samples were collected from households within geographic areas that had a high Caribbean population.<sup>[22]</sup> Caribbean Blacks were sampled from residential areas that reflect the distribution of the African Americans population and from additional metropolitan areas where Caribbean Blacks composed more than 10% of the population.<sup>[23]</sup>

### Interviews

Most of the interviews were conducted face-to-face using computer assisted interviewing. About 14% of all interviews were conducted either entirely or partially by telephone.<sup>[22]</sup>

### Interviewer training

Due to methodological decisions to enroll community based interviewers and also interviewer-respondent race matching, the NSAL needed to conduct extensive interviewer training and recruitment. The existing pool of available trained interviewers at Survey Research Center had very few African-Americans. Thus, the NSAL used extensive and creative strategies to recruit local and indigenous Black interviewers. These strategies included recruiting retired teachers and other community professionals and posting flyers in Black neighborhoods in places frequented by potential interviewers, such as barbershops, hair salons, community centers and churches. NSAL held four interviewer training sessions over the course of 14 months. NSAL trained and hired more than 300 interviewers. Standard interviewer training sessions were adjusted to make the trainees more culturally sensitive.<sup>[22]</sup>

### Psychiatric disorders

Lifetime major depressive disorder, generalized anxiety disorder, post-traumatic stress disorder, alcohol abuse and drug abuse were evaluated based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), using World Mental Health Composite International Diagnostic Interview (WMH-CIDI).<sup>[23]</sup> More details of the methodology used in the NSAL have been previously described.<sup>[22]</sup> Kessler *et al.*, have

shown that WMH-CIDI diagnoses are “consistent” with diagnoses based on a state-of-the-art clinical research diagnostic interview (Structured Clinical Interview for DSM-IV).<sup>[24]</sup>

### Lifetime serious suicide ideation

Participants were asked “Have you ever seriously thought about suicide?” As with all other questions asked, participants could refuse to answer this question. Other questions related to suicidal attempt and plan were also asked, but were not included in this study.<sup>[25]</sup>

### Covariates

Age, gender, education level, marital status, employment and region (Northeast, Midwest, South and West) were considered as covariates.

### Moderator

In this study, ethnicity was considered as the moderator. Ethnic groups in this study composed of African Americans and Caribbean Blacks. Individuals were considered Caribbean Blacks, if they met any of the following inclusion criteria: 1) being of West Indian or Caribbean descent, 2) being from a country in the Caribbean region, or 3) having parents or grandparents that were born in a country within the Caribbean region. Blacks who did not report Caribbean ancestry were considered African Americans.

### Statistical analysis

Due to the complex sample design, Stata-12 was used to estimate standard errors in the design-based analysis of the weighted and clustered data. Taylor series linearization was used to estimate standard errors. Sub-population analyses were used for all inferences. Logistic regressions were used for data analysis. Multi-co-linearity between the covariates was ruled out. *P* value less than 0.05 was considered statistically significant, while *P* value larger than 0.05, but smaller than 0.1 was considered marginally significant.

First, two ethnic specific logistic regressions were fitted to the data, in which psychiatric disorders (i.e., major depressive disorder, general anxiety disorder, post-traumatic stress disorder, drug abuse disorder and alcohol abuse) were independent variables, serious suicide ideation was the main outcome and socio-demographics (i.e., age, gender, education level, employment,

marital status and country region) were control variables. We also fitted two additional logistic regression models to the pooled sample. The first model did not include interaction terms. The second model included five interaction terms (between ethnicity and each psychiatric disorder). For the final model, all main effects were kept in the model, even if they were not statistically significant.

## RESULTS

As depicted in Table 1, most African Americans and Caribbean Blacks did not meet criteria for the five lifetime psychiatric disorder(s) included in this study. Among African Americans, major depressive disorder, general anxiety disorder, post-traumatic stress disorder, alcohol abuse disorder and unemployment were positively associated with lifetime suicidal ideation, while age was negatively associated with lifetime suicidal ideation. Gender, education level, marital status and country region were not associated with lifetime suicidal ideation [Table 2].

Among Caribbean Blacks, major depressive disorder, drug abuse and never being married were positively associated, and age and general

**Table 1:** Descriptive statistics of study variables among African Americans and Caribbean Blacks (*n*=5,181)

Characteristics	African Americans ( <i>n</i> =3,570)	Caribbean Blacks ( <i>n</i> =1,621)
	<b>Mean (SD)</b>	
Age	42.32 (14.49)	40.27 (5.77)
Education	12.43 (2.23)	12.88 (1.01)
Income	36,833 (33,068)	47,044 (15,190)
	<b><i>n</i> (%)</b>	
Gender		
Male	1,271 (44.02)	643 (50.87)
Female	2,299 (55.97)	978 (49.13)
Marital status		
Married/partner	1,222 (41.65)	693 (50.15)
Widowed, separated, divorced	1,164 (26.77)	385 (18.93)
Never married	1,176 (31.57)	543 (30.91)
Psychiatric disorder		
Yes	1,361 (40.06)	498 (37.40)
No	2,060 (59.94)	1,084 (62.60)

SD=Standard deviation

anxiety disorder were negatively associated with lifetime suicidal ideation. Post-traumatic stress disorder, alcohol abuse disorder, gender, education level, employment and country region were not significantly associated with lifetime suicidal ideation [Table 3].

In the absence of interaction terms, the model with the pooled sample showed that major depressive disorder, general anxiety disorder, post-traumatic stress disorder, alcohol abuse disorder and unemployment were all positively associated with lifetime suicidal ideation. Drug abuse was marginally associated with higher lifetime suicidal ideation. Age was negatively associated with lifetime suicidal ideation, and ethnicity was not significantly associated with lifetime suicidal ideation [Table 4].

**Table 2:** Impact of psychiatric disorders (lifetime) on suicidal ideation (lifetime) among African Americans (n=3,570)

Characteristics	Odds ratio	SE	95% CI	
			Lower bound	Upper bound
Major depressive disorder	3.46****	0.48	2.61	4.58
General anxiety disorder	2.18***	0.62	1.23	3.88
Post-traumatic stress disorder	2.87****	0.51	2.00	4.10
Drug abuse	1.46	0.41	0.83	2.57
Alcohol abuse	1.70***	0.31	1.17	2.47
Age	0.98****	0.00	0.97	0.99
Gender <sup>#</sup>	1.09	0.16	0.81	1.48
Education level <sup>##</sup>				
12 years	1.00	0.20	0.67	1.49
13-15 years	0.79	0.17	0.51	1.23
More than 15 years	0.84	0.18	0.54	1.30
Work status <sup>###</sup>				
Unemployed	1.74***	0.31	1.22	2.49
Not in labor market	1.31	0.25	0.89	1.93
Marital status <sup>####</sup>				
Divorced/separated/widowed	1.17	0.23	0.78	1.75
Never married	0.79	0.13	0.56	1.11
Region <sup>#####</sup>				
Midwest	0.81	0.20	0.49	1.33
South	0.71	0.16	0.45	1.13
West	0.98	0.47	0.37	2.60

\*\*\*\*P<0.001, \*\*\*P<0.01, \*\*P<0.05, \*P<0.1, ###Reference Group=Employed, ####Reference Group=Married, #####Reference Group=Northeast. SE=Standard error, CI=Confidence interval, #Reference Group=Male, ##Reference Group=Education less than 12 years,

The pooled model with interaction terms showed that major depressive disorder, general anxiety disorder, post-traumatic stress disorder, alcohol abuse disorder and unemployment were all positively associated with lifetime suicidal ideation. Drug abuse did not have any main effect on lifetime suicidal ideation. Age was negatively associated with lifetime suicidal ideation and African American ethnicity had a marginally significant and positive main effect on lifetime suicidal ideation. Interaction between Caribbean Black ethnicity and drug abuse was positive and marginally significant, showing that the effect of drug abuse on suicidal ideation is larger among Caribbean Blacks than African American. The interaction between Caribbean Black ethnicity and anxiety disorder was statistically significant, suggesting that the effect of anxiety disorder on suicidal ideation is

**Table 3:** Impact of psychiatric disorders (lifetime) on suicidal ideation (lifetime) among Caribbean Blacks (n=1,621)

Characteristics	Odds ratio	SE	95% CI	
			Lower bound	Upper bound
Major depressive disorder	3.88***	1.50	1.74	8.62
General anxiety disorder	0.18*	0.17	0.03	1.22
Posttraumatic stress disorder	3.02	2.02	0.76	12.06
Drug abuse	24.89**	29.92	2.07	299.29
Alcohol abuse	0.76	0.88	0.07	8.48
Age	0.98**	0.01	0.96	1.00
Gender <sup>#</sup>	1.54	0.50	0.78	3.02
Education level <sup>##</sup>				
12 years	1.40	0.53	0.64	3.06
13-15 years	1.28	0.64	0.45	3.60
More than 15 years	1.27	0.50	0.56	2.88
Work status <sup>###</sup>				
Unemployed	0.56	0.32	0.17	1.84
Not in labor market	0.79	0.47	0.23	2.70
Marital status <sup>####</sup>				
Divorced/separated/widowed	0.64	0.34	0.21	1.92
Never married	2.44***	0.74	1.30	4.58
Region <sup>#####</sup>				
Midwest	3.03	2.15	0.70	13.16
South	1.69	0.78	0.65	4.38
West	2.31	1.26	0.75	7.14

\*\*\*P<0.01, \*\*P<0.05, \*P<0.1. #Reference Group=Male, ##Reference Group=Education less than 12 years, ###Reference Group=Employed, ####Reference Group=Married, #####Reference Group=Northeast. SE=Standard error, CI=Confidence interval

**Table 4:** Impact of psychiatric disorders (lifetime) on suicidal ideation (lifetime) among African Americans and Caribbean Blacks ( $n=5,181$ )

Characteristics	Odds ratio	SE	95% CI	
			Lower bound	Upper bound
Major depressive disorder	3.58****	0.48	2.75	4.68
General anxiety disorder	2.05**	0.56	1.18	3.56
Post-traumatic stress disorder	2.84****	0.49	2.01	4.01
Drug abuse	1.64*	0.44	0.96	2.82
Alcohol abuse	1.75***	0.32	1.21	2.54
Age	0.98****	0.00	0.97	0.99
Gender <sup>#</sup>	1.10	0.16	0.83	1.46
Education level <sup>##</sup>				
12 years	0.98	0.18	0.67	1.43
13-15 years	0.80	0.16	0.53	1.20
More than 15 years	0.84	0.17	0.56	1.27
Work status <sup>###</sup>				
Unemployed	1.65***	0.28	1.18	2.31
Not in labor market	1.31	0.23	0.92	1.87
Marital status <sup>####</sup>				
Divorced/separated/widowed	1.15	0.23	0.78	1.71
Never married	0.84	0.14	0.61	1.17
Region <sup>#####</sup>				
Midwest	0.87	0.21	0.53	1.40
South	0.78	0.17	0.49	1.22
West	1.09	0.47	0.46	2.59
Ethnicity (African American)	1.13	0.33	0.63	2.02

\*\*\*\* $P<0.001$ , \*\*\* $P<0.01$ , \*\* $P<0.05$ , \* $P<0.1$ . <sup>#</sup>Reference Group=Male, <sup>##</sup>Reference Group=Education less than 12 years, <sup>###</sup>Reference Group=Employed, <sup>####</sup>Reference Group=Married, <sup>#####</sup>Reference Group=Northeast. SE=Standard error, CI=Confidence interval

larger among African Americans than Caribbean Blacks [Table 5].

## DISCUSSION

Based on our findings, ethnicity may modify the additive effect of lifetime psychiatric disorders on suicidal ideation among Black adults in the United States. Based on our additive model, anxiety disorder was positively associated with serious suicidal thoughts among African Americans, but not Caribbean Blacks, while drug abuse was associated with suicidal thoughts among Caribbean Blacks, but not African Americans.

**Table 5:** Impact of psychiatric disorders (lifetime) on suicidal ideation (lifetime) among African Americans and Caribbean Blacks ( $n=5,181$ )

Characteristics	Odds ratio	SE	95% CI	
			Lower bound	Upper bound
Major depressive disorder	3.45***	0.48	2.62	4.56
General anxiety disorder	2.18**	0.62	1.24	3.84
Posttraumatic stress disorder	2.87***	0.51	2.02	4.09
Drug abuse	1.47	0.41	0.84	2.56
Alcohol abuse	1.72**	0.31	1.19	2.47
Age	0.98****	0.00	0.97	0.99
Gender <sup>#</sup>	1.10	0.16	0.83	1.47
Education level <sup>##</sup>				
12 years	1.00	0.19	0.68	1.47
13-15 years	0.80	0.16	0.53	1.21
More than 15 years	0.85	0.18	0.57	1.29
Work status <sup>###</sup>				
Unemployed	1.68**	0.29	1.20	2.37
Not in labor market	1.30	0.24	0.91	1.88
Marital status <sup>####</sup>				
Divorced/separated/widowed	1.16	0.23	0.78	1.72
Never married	0.83	0.14	0.60	1.16
Region <sup>#####</sup>				
Midwest	0.84	0.20	0.52	1.37
South	0.75	0.16	0.48	1.17
West	1.03	0.47	0.42	2.55
Ethnicity (African American)	1.66*	0.44	0.98	2.81
Caribbean Blacks	1.71	0.87	0.62	4.76
*Depression				
Caribbean Blacks	0.03***	0.04	0.00	0.33
*Anxiety				
Caribbean Blacks *PTS	1.27	0.90	0.30	5.29
Caribbean Blacks	17.61*	27.23	0.79	390.59
*Drug abuse				
Caribbean Blacks	0.37	0.55	0.02	7.36
*Alcohol abuse				

\*\*\* $P<0.01$ , \*\* $P<0.05$ , \* $P<0.1$ . <sup>#</sup>Reference Group=Male, <sup>##</sup>Reference Group=Education less than 12 years, <sup>###</sup>Reference Group=Employed, <sup>####</sup>Reference Group=Married, <sup>#####</sup>Reference Group=Northeast. PTS=Post-traumatic stress disorder. SE=Standard error, CI=Confidence interval

A recent study among Blacks in the United States showed that number of psychiatric disorders is a risk factor of lower age at suicidal ideation and

this effect might be dose dependent. In that study; however, the number of psychiatric disorders-not the type of the disorder-was shown to be predictive of age of onset of suicidal ideation among Black adults.<sup>[25]</sup> Similar effects have been reported among other ethnicities.<sup>[26-28]</sup>

Based on Joe *et al.*, psychiatric disorders predict suicide attempts among Black ideators. Joe *et al.*, found that Blacks with psychiatric disorders are eight times more likely to attempt suicide than those without psychiatric disorders.<sup>[9]</sup> Kessler *et al.* has also showed that among the general population of US adults, number of psychiatric disorders might be the strongest predictor of suicidal attempt.<sup>[29]</sup> Major depressive disorder is one of the most widely known psychiatric disorders, which can affect the rate of suicide.<sup>[19]</sup>

Based on the results of current study, suicide prevention programs geared toward Blacks that consider psychiatric disorders may benefit from an ethnic-specific design.<sup>[30]</sup> Although screening and treatment of psychiatric disorders is a crucial step in suicide prevention among Black adults, screening of anxiety seems to be more important for African Americans while drug use disorder may be of higher importance for Caribbean Blacks. Thus program planners who wish to reduce suicidal behaviors of Black adults through screening and treatment of psychiatric disorders may benefit from tailoring their screening and interventions based on ethnicity.

The current study had several limitations. As the NSAL was a cross-sectional survey, causative associations are not plausible. Moreover, the validity of the single item measure for lifetime suicidal thought is unknown. Suicidal thought measurement is subjected to possible over-or under-reporting in this study. In addition, we do not have evidence regarding similar validity of diagnoses based on Composite International Diagnostic Interview among African Americans and Caribbean Blacks.<sup>[24,31]</sup>

Although our study suggested that ethnicity shapes suicidality of Black adult populations due to psychiatric disorders, we did not study why these associations depend on ethnicity. Future research should explore possible buffers among Caribbean Blacks that cancel out the effect of general anxiety disorder as a risk factor of suicidal ideation. Researchers are also invited

to study possible mechanisms that may reduce African Americans suicidal thoughts due to drug abuse.

## CONCLUSIONS

To conclude, ethnicity may moderate the additive effect of psychiatric disorders on suicidal ideation among Black adults in the United States. Based on our model, the effect of anxiety disorder seems to be larger for African Americans, while the effect of drug abuse may be more pronounced for Caribbean Blacks.

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