Original Report

Risk of Cardiovascular Disease Associated with Serious Mental Illness among People of African Ancestry

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Background: Individuals with severe mental illness (SMI)—schizophrenia, schizoaffective disorder, and bipolar disorder—are at higher risk for cardiovascular disease (CVD) than the general population. Black Americans are known to have a higher prevalence of cardiovascular risk factors. However, the association of SMI with CVD and its risk factors in this population has not been widely examined.

Methods: The analytic sample included 2305 participants from the African Ancestry-Genomic Psychiatric Cohort enrolled in Brooklyn, New York, between 2016 and 2020. SMI was identified by using the Diagnostic Interview for Psychoses and Affective Disorders. Associations between SMI and CVD and its risk factors, including high body mass index, diabetes, hypertension, and hypercholesterolemia, were evaluated by using logistic regression models adjusted for age, sex, alcohol, and tobacco use.

Results: After multivariable adjustment, compared to those without SMI, participants with SMI had significantly higher odds of CVD and CVD risk factors. After adjusting for all CVD risk factors mentioned above, SMI was independently associated with 57% higher odds of CVD (OR=1.57; 95% CI, 1.14-2.15). These associations were more pronounced among middle-aged adults (30-49 years), most notably for CVD (OR=5.13; 95% CI, 2.45-10.75), hypercholesterolemia (OR=2.88; 95% CI, 1.80-4.64), and diabetes (OR=3.08; 95% CI, 1.88-5.02).

Conclusions: In this sample, SMI was associated with higher CVD risk even after controlling for other CVD risk factors. There is an urgent need for earlier recognition and treatment of CVD and its risk factors in African American populations with SMI. Targeted clinical and lifestyle interventions in this population are warranted. *Ethn Dis.* 2025;35(2):58–64; doi:10.18865/EthnDis-2022-2029

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Introduction

Schizophrenia (SCZ), schizoaffective disorder (SCZaff), and bipolar disorders (BDs) are often categorized as severe mental illnesses (SMIs) that are associated with higher mortality and shorter life expectancy.[1] Among those with SMI, cardiovascular disease (CVD) is the leading cause of mortality, causing up to 20% of deaths with an average reduction of life expectancy of 20%.[2,3] A better understanding of factors contributing to the increased incidence of CVD in individuals with SMI could help improve the observed health inequality.[4]

Cardiovascular risk factors are common in individuals with SMI, including poor-health behaviors such as smoking and reduced physical activity[5,6]; underlying health conditions such as diabetes, obesity, and hypertension; and side effects of second-generation antipsychotic medications affecting glucose and lipid metabolism.[3,6-8]

There are significant racial disparities in CVD prevalence and mortality[9,10] and SMIs.[11,12] African Americans (AAs) represent 12.7% of the total US population, making them the second largest minority population after the Hispanic/Latinx population.[13] However, among all ethnic groups in the United States, AA individuals have the highest prevalence of CVD, with CVD-related age-adjusted mortality more than 30% higher than in the overall population.[7,11] Similarly, AA adults are 20% more likely than the overall US population to experience mental health issues.[14]

However, despite this higher prevalence, Black Americans are less likely to receive a formal diagnosis and appropriate mental health services. In 2017, only 8.7% of Black adults older than 18 years received mental health care, compared to 18.6% of White adults.[15] This disparity may contribute to more severe and untreated symptoms within the Black community.[16]

Social determinants of health significantly contribute to disparities in CVD and SMI outcomes among AAs.[17]

Limited access to affordable health care, underinsurance, and a shortage of nearby facilities and mental health specialists delay diagnosis and treatment, worsening health outcomes.[18] High-poverty neighborhoods with limited recreational spaces and inadequate infrastructure add stress and reduce opportunities for physical activity, key factors in preventing CVD.[19] Additionally, systemic racism and implicit bias in health care delivery exacerbate these inequities,[20] while chronic stress from racism further elevates the risk for CVD and SMIs.[10] Despite these disparities in comorbid conditions of AAs with SMI and CVD, few studies have investigated the prevalence of CVD and associated risk factors in those with and without SMI in AAs.[3,4]

The present study aimed to investigate the risk of CVD and related risk factors in those with and without SMI in a large cohort of AA adults living in Brooklyn, New York, from the African Ancestry-Genomic Psychiatric Cohort (AA-GPC), a study that was initiated to identify genetic risk markers of SCZ and BD in individuals of African ancestry.[21,17] Consistent with the evidence of the influence of age in predisposition to CVD and SMI, we also investigated age-stratified risks of CVD and risk factors among individuals with SMI. By focusing solely on individuals of AA descent with SMI and other coexisting conditions, this investigation holds the potential to advance our understanding and enhance our ability to both comprehend and shape policies aimed at alleviating mental health illness and health care disparities for AA populations with SMI.

Methods

Study Sample

The AA-GPC cohort includes 792 patients with SCZ, SCZAff, or BD and 1513 controls without these diagnoses. All participants were older than 18 years and self-identified as having African ancestry and were recruited via online advertising and hand-to-hand flyers in outpatient, church, and community settings. The AA-GPC cohort has been described previously.[16,17,21] Individuals were enrolled between 2016 and 2020 in Brooklyn, New York. The study's protocol was approved by the State University of New York (SUNY) Downstate Health Sciences University Institutional Research Ethics Committee, and informed consent was obtained from all study participants.

Measure of Exposure

All participants completed a 4-page screening questionnaire (Supplementary Table 1) including demographics, symptoms related to SCZ schizophrenia, SCZaff, tobacco use disorder (TUD), alcohol use disorder (AUD), depression, posttraumatic stress disorder, and medical conditions. Those without a personal or family history of SCZ, SCZaff, or BD served as controls, as confirmed through the screening questionnaire and an interview. The presence of SMI in individuals reporting a diagnosis of SCZ, SCZaff, or BD was verified via clinician letters, psychotropic medication lists, or clinical data. Additionally, individuals who screened positive for SMI, based on Diagnostic and Statistical Manual of Mental Disorder (DSM-IV) criteria, underwent structured face-to-face interviews conducted by a mental health clinician using the Diagnostic Interview for Psychoses and Affective Disorders.

Measurement of Outcomes and Covariates

We collected self-reported CVD and risk factors (diabetes, hypertension, hypercholesterolemia, body mass index [BMI] $\geq$25 kg/m^2) from the same 4-page questionnaire (Supplementary Table 1), with binary "yes" or "no" responses.

The assessment also included screening for AUD and TUD through 6 questions related to AUD (score range: 0-6) and 4 questions concerning TUD (score range: 0-4), where higher scores indicated increased severity.[16,21,23] Adapted versions of the cut-down, annoyed, guilty, and eye-opener instrument (CAGE) were used to evaluate AUD, as provided in Supplementary Table 1.

Statistical Methods

Descriptive statistics were used to characterize the study sample by the presence or absence of SMI. The associations between SMI and each of the outcome variables (cardiovascular disease, hypertension, hypercholesterolemia, high blood glucose level, high BMI) were assessed first with unadjusted logistic regression models (model 1) then adjusted by age and sex (model 2), and also in models that adjusted for, sex, AUD score, and TUD score (model 3). Finally, in a fully adjusted model (model 4), we examined the association between SMI and CVD after adjusting for demographics and all CVD risk factors (AUD, TUD, hypertension, hypercholesterolemia, diabetes, high BMI). We repeated the analysis after stratification by age group (<30 years, 30-49 years, and $\geq$50 years), as age is known to be an important effect modifier of cardiovascular conditions in the general population. Data handling and statistical analyses were performed with the IBM Statistical Package for the Social Science (SPSS) for Windows, version 28.0.[24]

Results

Characteristics of the Study Sample

The study sample had a mean age of 46.4 years (SD=14.2; range, 18-85) and was 51% female. SMI was identified in 792 individuals (34.3%). Demographics and clinical characteristics of the sample

Table 1. Demographic and clinical characteristics of the study population (N=2305)

	Individuals with SMI (n=790)	Individuals without SMI (n=1515)	P value[a]
Age, y			
Mean (SD)	44.2 (12.4)	47.6 (14.9)	<.001
≥50	320 (40.5)	759 (50.1)	
30-49	340 (43.0)	518 (34.2)	<.001
<30	130 (16.5)	238 (15.7)	
Female sex, n (%)	355 (44.9)	823 (54.3)	<.001
BMI, mean (SD), kg/m^2	30.3 (7.4)	29.2 (6.9)	<.001
High BMI, n (%)	587 (74.3)	1070 (70.6)	.0063
Hypertension	325 (41.1)	486 (32.1)	<.001
Hypercholesterolemia	223 (28.2)	272 (18.0)	<.001
Diabetes mellitus	172 (21.8)	236 (15.6)	
CVD	104 (13.2)	106 (7.0)	<.001
Tobacco use disorder score, mean (SD)	2.51 (1.60)	0.87 (1.42)	<.001
Alcohol use disorder score, mean (SD)	1.71 (2.04)	0.33 (0.98)	<.001

BMI, body mass index; CVD, diagnosis of myocardial infarction or coronary heart disease; High BMI, body mass index >25 kg/m^2; SMI, severe mental illness, DM Diabetes Mellitus, HTN Hypertension, LDL.>130mg/dL Hypercholesterolemia

[a] P value for categorical variables computed with χ^2 test; P value for continuous variables compared by using Mann-Whitney *U* test for independent samples

stratified by SMI status are presented in Table 1. SMI was more common in the 31-49 and ≥50 years age groups (40.5% and 43.0%, respectively) than in the <30 years age group (16.5%), and was more common in men (54.3%).

The prevalence of CVD was approximately twice as high in those with SMI (13.2%) than in those without (7.0%). Cardiovascular risk factors were also overrepresented in individuals with SMI: diabetes, 21.8% versus 15.6%; hypercholesterolemia, 28.2% versus 18.0%; hypertension, 41.1% versus 32.1%; and high BMI, 74.3 versus 70.6% (Table 1, Figure 1). Compared to controls, individuals with SMI had significantly higher TUD scores (mean 2.51, SD=1.60, P=.001 vs mean 0.87, SD=1.42, P=.001) and AUD scores (mean 1.71, SD=0.80 vs mean 0.33, SD=0.98, P=.001) (Table 1).

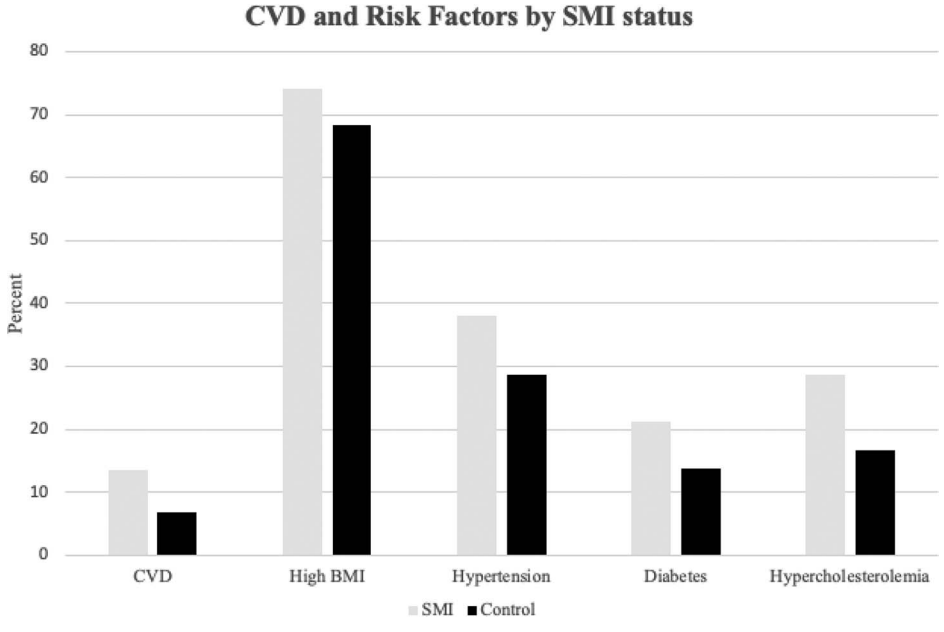

Figure 1. Graphical distribution of CVD and various cardiovascular risk factors in individuals SMI (individuals without SMI: n=1513; individuals with SMI: n=792). BMI, body mass index; CVD, diagnosis of myocardial infarction or coronary heart disease; SMI, severe mental illness

Association of SMI with CVD and Cardiovascular Risk Factors

Results of logistic regression models examining associations between SMI and cardiovascular disease and its risk factors are presented in Table 2. In unadjusted models (model 1), compared to controls, those with SMI had significantly higher odds of self-reported CVD, hypertension, and hypercholesterolemia, but not diabetes and high BMI. In models that adjusted for age and sex (model 2), and age, sex, AUD score, and TUD score (model 3), there were significantly higher odds of CVD and all CVD risk factors among those with SMI: CVD (OR=1.76; 95% CI, 1.24-2.50; P<.001), hypertension (OR=1.59; 95% CI, 1.25-2.00; P<.001), hypercholesterolemia (OR=1.81; 95% CI, 1.40-2.34; P<.001), diabetes (OR=1.98; 95% CI, 1.50-2.60; P<.001), and BMI (OR=1.53; 95% CI, 1.21-1.94; P<.001). After adjusting for all CVD risk factors (model 4), SMI was independently associated with 57% higher odds of CVD (OR=1.57; 95% CI, 1.14-2.15; P<.001).

Age-Stratified Analyses

We repeated the models after stratifying by age group (Table 3) and found that associations between SMI and CVD risk were markedly stronger in the middle-aged adults (ages 30-

Table 2. Odds of CVD and vascular risk factors associated with SMI (SMI: n=792, controls: n=1513)

	CVD, OR (95% CI)	Hypertension, OR (95% CI)	Hypercholesterolemia, OR (95% CI)	Diabetes, OR (95% CI)	High BMI, OR (95% CI)
Model 1	2.0 (1.51-2.67)[a]	1.47 (1.23-1.76)[a]	1.76 (1.34-2.32)[a]	1.37 (1.02-1.83)[c]	1.20 (0.99-1.45)
Model 2	2.27 (1.69-3.04)[a]	1.91 (1.56-2.32)[a]	2.19 (1.76-2.72)[a]	1.77 (1.41-2.23)[a]	1.28 (1.05-1.56)[c]
Model 3	1.76 (1.24-2.50)[b]	1.59 (1.25-2.00)[a]	1.81 (1.40-2.34)[a]	1.98 (1.50-2.60)[a]	1.53 (1.21-1.94)[a]
Model 4	1.57 (1.14, 2.15)[b]				

Model 1: Unadjusted

Model 2: Adjusted for age and sex

Model 3: Adjusted for age, sex, and AUD and TUD scores

Model 4: Adjusted for age, sex, AUD and TUD scores, hypertension, hypercholesterolemia, diabetes, and high BMI

AUD, alcohol use disorder; BMI, body mass index; CVD, diagnosis of myocardial infarction or coronary heart disease; SMI, severe mental illness; TUD, tobacco use disorder

[a] P<.001

[b] P<.01

[c] P<.05

49 years). In this group, after controlling for demographic factors and AUD and TUD, individuals with SMI were at 5.13 higher odds of heart disease than those without SMI.

Similarly, in this age group SMI was associated with higher odds of hypertension, high cholesterol levels, and high blood glucose levels, although there was not a statistically significant relationship with BMI.

Discussion

In this cross-sectional study of 2305 individuals from African Ancestry, we found higher prevalence of CVD and its risk factors (hypertension, hypercholesterolemia, diabetes, and high BMI) among individuals with SMI. Even after adjustment for these risk factors, people with SMI had 57% higher odds of CVD than those without SMI. Our findings are consistent with those of a large US-based sample (n=579,924) of

Table 3. Age-stratified odds of cardiovascular disease and vascular risk factors associated with SMI

	CVD, OR (95% CI)	Hypertension, OR (95% CI)	Hypercholesterolemia, OR (95% CI)	Diabetes, OR (95% CI)	High BMI, OR (95% CI)
			Age less than 30 years (SMI: n=131; no SMI: n=237)		
Model 1	4.40 (1.12-17.33)[a]	3.48 (1.60-7.57)[b]	2.11 (0.79-5.61)	3.02 (0.97-9.42)	1.60 (1.03-2.48)[a]
Model 2	4.34 (1.08-17.39)[a]	3.22 (1.47-7.08)[b]	1.88 (0.70-5.06)	3.08 (0.97-9.80)	1.75 (1.12-2.75)[a]
Model 3	2.82 (0.57-14.04)	2.42 (0.97-6.03)	1.66 (0.52-5.31)	2.22 (0.58-8.55)	1.54 (0.92-2.58)
Model 4	3.50 (0.87-14.01)	-	-	-	-
			Age 30-49 years (SMI: n=341; no SMI: n =517)		
Model 1	5.01 (2.63-9.53)[c]	2.23 (1.63-3.06)[c]	3.30 (2.21-4.90)[c]	2.46 (1.64-3.68)[c]	1.10 (0.81-1.51)
Model 2	5.04 (2.64-9.61)[c]	2.26 (1.64-3.10)[c]	3.33 (2.24-4.97)[c]	2.50 (1.66-3.75)[c]	1.14 (0.83-1.56)
Model 3	5.13 (2.45-10.75)[c]	1.69 (1.16-2.48)[b]	2.88 (1.80-4.64)[c]	3.08 (1.88-5.02)[c]	1.33 (0.90-1.97)
Model 4	2.95 (1.56-5.54)[c]	-	-	-	-
			Age 50 years and older (SMI: n=320; no SMI: n=759)		
Model 1	1.65 (1.15-2.36)[b]	1.50 (1.15-1.95)[b]	1.77 (1.34-2.32)[c]	1.37 (1.02-1.83)[a]	1.16 (0.86-1.58)
Model 2	1.63 (1.13-2.33)[b]	1.57 (1.20-2.05)[b]	1.80 (1.37-2.36)[c]	1.43 (1.06-1.91)[a]	1.22 (0.90-1.66)
Model 3	1.15 (0.75-1.77)	1.40 (1.02-1.91)[a]	1.43 (1.04-1.98)[a]	1.55 (1.09-2.19)[a]	1.60 (1.11-2.31)[a]
Model 4	1.02 (0.70-1.50)	-	-	-	-

Model 1: Unadjusted

Model 2: Adjusted for sex

Model 3: Adjusted for sex and AUD and TUD scores

Model 4: Adjusted for sex, AUD and TUD scores, hypertension, hypercholesterolemia, diabetes, high BMI

AUD, alcohol use disorder; BMI, body mass index; CVD, diagnosis of myocardial infarction or coronary heart disease; SMI, severe mental illness; TUD, tobacco use disorder

[a] P<.05

[b] P<.01

[c] P<.001

community-dwelling outpatients with SMI (defined as having BD, SCZ, or SCZaff) compared with patients without SMI.[8] Rossom et al[8] used estimated 10-year and 30-year cardiovascular risk scores and found that patients with SMI have elevated CVD risk, compared with patients without SMI. Similarly, in a population-based New Zealand cohort study of 495,388 patients aged 30-74 years without prior CVD, Cunningham et al[7] found that individuals who have been diagnosed with SCZ or BD had higher rates of diabetes, obesity, and hypercholesterolemia than those without any history of mental illness.

Previous studies have shown that AAs with SMI are at higher risk of CVD-related morbidity.[3,12] A small US-based study of individuals with SMI found a higher prevalence of cardiovascular risk factors in Black individuals (n=111) than in White individuals (n=163). Black persons with SMI were more likely to be obese and have hypertension compared with White persons.[7,8]

There are several potential pathophysiologic mechanisms underlying the association between SMI and CVD. Second-generation antipsychotics diminish insulin sensitivity through elevated inflammatory marker activity, thereby altering body fat distribution and free fatty acid levels, leading to weight gain[25] and development of dyslipidemia and type 2 diabetes.[26,27]

Existing research suggests that behavioral mechanisms linked to BD and SCZ may increase susceptibility to CVD and its risk factors.[5,6,12,28,29] Individuals with SMI are more likely to engage in high-risk behaviors such as smoking and alcohol use, which are more prevalent in this population than in the general population.[24,29,30] Among Black Americans with SMI, these behaviors may be further exacerbated by stress from racism and discrimination,[31] limited health care access, and lower socioeconomic status.[10,20] Smoking is often used as a coping mechanism for relaxation, socialization,[3] or boredom,[32,35] contributing to its higher prevalence in individuals with SMI.[26] The interaction of nicotine with several neurotransmitters, including dopamine, may explain the higher use of nicotine as a form of self-medication to reduce symptoms associated with SCZ and antipsychotic medication side effects.[26] The findings of the current study are consistent with those of previous studies that suggest that CVD risk is amplified by higher prevalence of smoking and drinking among individuals with SMI.[22,24] This research adds to the body of knowledge regarding the crossroads of SMI, CVD risks, and race. While our results are consistent with previous studies, our discovery of heightened CVD risk that persists—even after adjusting for established risk factors and AUD and TUD—implies an underlying element propelling this increased risk beyond the typical analyses involving AUD and TUD.

We found differences in the association between SMI and CVD and its risk factors by age. After age stratification, we found the strongest associations among those aged 30-49 years; compared to individuals without SMI, they were 5 times more likely to have CVD and 3 times more likely to have diabetes and hypercholesterolemia. Even after adjustment for hypertension, hypercholesterolemia, high BMI, and diabetes, participants with SMI in this age group were at nearly 3 times higher odds of having CVD. The minimal associations seen among those younger than 30 years may be explained by the fact that CVD and its risk factors develop over time, and most individuals in this age group have been sick for fewer than 10 years (if mean age of onset of SMI is around 21 years), with fewer than 10 years of exposure to antipsychotics.[29]

The differences in CVD risk were attenuated slightly in the older age group but were also significant. Older adults (≥50 years) with SMI were more likely to have high BMI than the younger groups, possibly attributable to sedentary behavior and lower physical activity that tends to increase with age.[31,34,35]

This study has several limitations. We examined the clinical data of physicians to confirm diagnoses of mental illness in participants. Nevertheless, we relied on self-reported physician diagnoses for their cardiovascular conditions such as diabetes, blood pressure, and cholesterol. The self-reporting of physician diagnoses may have introduced bias into our findings, as it is possible that individuals with SMI are more likely to suffer from recall bias and may have underreported or overreported their health conditions.[36] Future studies should integrate both self-reported data and clinical measures (eg, laboratory tests, medical records) to validate the accuracy of self-reported diagnoses for conditions like diabetes, hypertension, and cholesterol. This would help minimize recall bias and provide more reliable findings.

Also, we did not have data on behavioral and economic risk factors, including physical activity, diet, and income, which may have confounded our findings.[4] Given the generally lower socioeconomic status of our AA population, as indicated by predominantly Medicare or Medicaid insurance, our study sample may experience inadequate access to healthy foods and opportunities for exercise, which may contribute to CVD and its risk factors.[11] Another key limitation is our inability to directly quantify marijuana or other drug use, despite literature suggesting their potential role in the high prevalence of SMI and CVD.[16] Future studies should include these substances in a comprehensive assessment of modifiable risk factors. Lastly, although the sample was drawn from Brooklyn, New York, which includes an ethnically diverse population of AAs, the sample may not accurately reflect AA populations and their various sociodemographic characteristics throughout the United States.

Despite these limitations, our study benefited from a large homogenous AA cohort from similar geographic areas in

Brooklyn. Our findings of cardiovascular conditions at younger ages in those AAs with SMI is important because in general these age groups would be less likely to seek treatment for CVD.[37] The consistently high odds of CVD and associated CVD risk factors in SMI populations, particularly in the earlier 30- to 49-year age category for AAs, highlights an opportunity to address health inequities in AA populations that impart greater burden across the lifespan. The results underscore that not only is SMI a mental health issue but also it is strongly linked to poorer physical health outcomes. Thus, individuals with SMI should be considered a high-risk group for additional chronic health conditions and will benefit from early interventions to reduce the risk of developing severe health complications.

Our findings highlight the necessity for integrated care models that address both mental and physical health in individuals with SMI,[38] particularly in middle age when risks are more pronounced. In addition, early identification and treatment of cardiovascular risk factors in younger AA individuals with SMI are crucial, as they may benefit the most from lifestyle interventions like diet and exercise to reduce the risk of heart disease–related comorbidities.[39]

The Minority Health Improvement and Health Disparity Elimination Act of 2007 and the Health Equity and Accountability Act of 2020 were enacted to promote health care access and awareness among minorities and to further research to reduce health disparities.[40] This important legislation can be expanded to include younger and middle-aged AAs with SMI for more targeted intervention plans. Our findings suggest that the elevated risk of CVD outcomes in individuals with SMI persists even after adjusting for common risk factors such as AUD and SUD. This suggests that factors beyond standard diagnostic tools may significantly influence CVD risk and warrant further study. While lifestyle factors like diet and exercise play a role, their impact on CVD risk is likely mediated through conditions such as diabetes and hypercholesterolemia, which only partially explain the observed differences in CVD risk associated with SMI in this study.

There also is a critical need to address broader social determinants of health, such as systemic discrimination, unequal access to health care, and socioeconomic inequalities, which disproportionately affect AA communities. Economic empowerment, through initiatives such as job training programs, access to affordable health care, and financial literacy education is a crucial strategy for improving health outcomes in these populations. Furthermore, accessing evidence-based CVD treatments for AA individuals with SMI can be challenging,[41] suggesting that the focus of intervention should shift from merely changing individual behaviors to reforming systemic issues that inform health care access and quality. This includes addressing diagnostic overshadowing, the inadequate treatment of chronic conditions in people with SMI, and the compounded effects of racism and mental health–related discrimination.

This study is significant as it is one of the most comprehensive to examine the relationship between SMI and CVD exclusively in AAs. This study expands limited research on the intersection of SMI and CVD risk in ethnically diverse groups, revealing potential differences in marginalized populations compared to White populations. It underscores the need for tailored interventions to address CVD disparities in AA individuals with SMI, while also uniquely characterizing CVD risk factors across a broad age range to offer insights for effective prevention strategies.

Conflict of Interest

No conflict of interest reported by authors.

Author Contributions

Research Design & Concept: Salisu, Geer, Boutin-Foster, Pato Data Acquisition: Salisu, Geer, Pato Data Analysis & Interpretation: Salisu, Geer, Helzner, Pato Manuscript Draft: Salisu, Geer, Boutin-Foster, Helzner, Pato

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Pato, Boutin-Foster Statistical Expertise: Salisu, Helzner, Geer. Supervision: Geer, Helzner, Boutin-Foster, Pato

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