



# Ethnic Variation in the Association Between Objective and Subjective Health in Older Adults

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## Abstract

**Introduction:** The African Americans' health paradox can be defined as better subjective health held of African American individuals compared to White individuals, despite their higher objective and medical adversities such as chronic medical conditions (CMCs). This phenomenon depicts African Americans' relative resilience (advantage). However, most of the existing literature on this topic is limited to studies comparing African Americans and Whites. There is little research, if any, on this phenomenon among other ethnic groups. To fill this gap in the literature, this study tests the African Americans' health paradox with consideration of Latinos as the control group.

**Methods:** This cross-sectional study collected demographic data, socioeconomic status, CMCs, and subjective health of 734 African American and Latino older adults residing in south Los Angeles. Logistic regression was used for data analysis.

**Results:** 118 Latino and 616 African Americans entered our study. Overall, a higher number of CMCs was associated with lower subjective health, however, a statistically significant interaction between ethnicity and the number of CMCs suggested that this association is weaker for African Americans than Latinos, which is the African American health paradox.

**Conclusion:** African Americans with a higher number of CMCs report better subjective health compared to Latinos with the same number of CMCs. This finding is indicative of a relative advantage of African Americans compared to other ethnic groups.

**Keywords:** Ethnic Groups, Population Groups, Multimorbidity, Chronic Disease, Subjective Health, Self-Rated Health

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## Introduction

The link between objective (e.g., number of chronic medical conditions [CMCs]) and subjective (e.g., self-rated health [SRH]) health is well-established in health psychology literature.<sup>1,2</sup> Several national and local studies in community settings have documented an inverse association between number, types of CMCs and individuals' subjective wellbeing.<sup>3</sup> Individuals with heart disease, cancer, asthma, arthritis are at risk of depression, anxiety, poor SRH, and low quality of life.<sup>3</sup>

Although the link between subjective and objective health is known,<sup>4-6</sup> this linkage may differ across ethnic groups.<sup>7-14</sup> Different ethnic groups utilize different coping mechanisms to deal with adversities such as CMCs.<sup>15</sup> Although CMCs – SRH is also expected in African American populations, this association is expected to be weaker for African American individuals compared to White individuals.<sup>7-14</sup> However, comparative studies are exclusively limited to those comparing African American and White individuals. We are unaware of any comparative study of African American

people that has included a non-White control group.

African Americans' health paradox<sup>16,17</sup> can be defined as better subjective health of African American population, despite their worse objective health and other adversities. This phenomenon reflects the resilience of African American populations, particularly older adults who have high number of CMCs. Various scholars have attributed this observation to the growth and flourishing in the presence of adversity. Although this phenomenon is documented repeatedly,<sup>16,17</sup> it is unknown whether the paradox also exists when African Americans are compared with ethnic groups other than Whites. The current study tested the African Americans' health paradox with inclusion of Latinos as the control group.

## Methods

### Design and Setting

This cross-sectional study was conducted between 2015 and 2020 in low socioeconomic status areas of South Los Angeles. Latino and African American older adults with CMCs were

recruited from low-income housing, churches, and other community venues within this communal environment.

### **Participants and Sampling**

Participants were sampled in a non-randomized setting and all participants were individually interviewed with a healthcare provider in their location which was convenient and could maintain confidentiality. All participants reside in Service Planning Area 6 (SPA 6) of South Los Angeles, which is one of the most impoverished areas of Los Angeles, with most residents identifying as African American or Latino.<sup>18</sup> All participants had at least one CMC and aged sixty-five or older. For more information on methodology of this study, please see our previous publications.<sup>19-23</sup> The sample size was 734 individuals (118 Latino and 616 African American).

### **Variables**

This study collected data on demographic factors including ethnicity, age, sex/gender, socioeconomic status (educational attainment), living condition (alone), insurance (Medicare), number of CMCs, and self-rated health (SRH).

### **Independent Variable**

Number of CMCs. In this study, CMCs included (1) stomach or intestinal problems; (2) asthma or bronchitis; (3) arthritis; (4) hypertension/high blood pressure; (5) heart diseases; (6) diabetes; (7) chronic back pain; (8) cancer; (9) endocrine conditions and thyroid problems; (10) stroke; and (11) migraine/headache. The number of CMCs was measured by asking whether participants have been diagnosed with the conditions listed above.<sup>19-23</sup>

### **Outcome**

SRH was measured using conventional single-item measure. Poor SRH was coded as 1, and fair, good, very good, and excellent health was coded as 0. For this measure, we asked participants about their overall health. The responses ranged from excellent to poor. Poor SRH predicts all-cause mortality in the community and clinical sample population as well as in patients with chronic disease. Review and original articles have repeatedly shown that poor SRH is a robust determinant of mortality risk, above and beyond a wide range of social and clinical factors.<sup>24-31</sup>

### **Data Analysis**

Data analysis were performed using the Statistical Package for Social Sciences (SPSS) version 22 (SPSS Inc., Chicago, IL, USA). First Univariate, then bivariate, and at end multivariable statistical methods were used for data analysis. For univariate, we reported frequencies for categorical variables and means and standard deviations for continuous measures. For bivariate analysis, chi-square test and independent samples *t* test were employed to explore associations between ethnicity and study variables. We used logistic regression to test the overall association between our independent variable namely number of CMCs and our outcome namely poor SRH. All confounders were controlled in our logistic regression models.

Latino was coded as 0 and African Americans as 1. To test ethnic variation in this association, in our second model, we included an interaction term which was multiplicative effect of ethnicity and number of CMCs. We then ran a stratified model by ethnicity.

## **Results**

### **Univariate and Bivariate Analysis**

This study included 734 individuals, with 118 Latinos and 616 African Americans. **Table 1** shows the results of univariate analysis overall and by ethnicity. This table also shows differences between ethnic groups in terms of demographic data, SES, number of CMCs, and SRH. African Americans had higher education than Latinos. Our ethnic groups did not differ in age, gender/sex, CMCs, and SRH.

### **Multivariable Models in the Pooled Sample**

**Table 2** shows the results of logistic regression results with poor SRH as the outcome, demographic data and SES as covariates, and the number of CMCs as the independent variable. These models are performed overall in the absence and presence of ethnicity by the number of CMCs interaction term. In the overall sample, a higher number of CMCs was associated with higher odds of poor SRH. A statistically significant interaction was observed between ethnicity and number of CMCs on SRH suggestive of a stronger association for Latinos than African Americans.

### **Multivariable Models by Ethnicity**

**Table 3** shows the results of logistic regressions by ethnicity. The results suggested a stronger association between CMCs and SRH for Latinos than African Americans.

## **Discussion**

Current study revealed an association between number of CMCs and poor SRH: individuals with higher number of CMCs report worse SRH. This association, however, was weaker for African American than Latino individuals. This was indicative of African Americans' health paradox, defined as better subjective health of African Americans despite their higher number of CMCs, compared to Latinos.<sup>7-14</sup>

The observation that a higher number of CMCs is associated with worse SRH is well-documented as subjective and objective health tend to covary.<sup>4-6</sup> This effect is described for many CMCs including cardiovascular,<sup>32</sup> renal,<sup>13</sup> gastrointestinal,<sup>33</sup> and respiratory conditions.<sup>34</sup> Individuals with CMCs report limitations in their activities of daily living,<sup>35</sup> and are likely to have depression,<sup>36</sup> and disability.<sup>37</sup> Additionally, CMCs cause fatigue,<sup>38</sup> pain,<sup>39</sup> and other disabling symptoms.<sup>40</sup> In addition, some CMCs cause fear of death and death anxiety, which reduces wellbeing and SRH.<sup>41</sup> Other aspects of wellbeing such as sleep, sexuality, mobility, and socialization may be affected by CMCs, all reducing SRH and wellbeing.<sup>42</sup> As a result, research uses CMC count rather than CMC type. However, some CMCs such as chronic renal disease may cause more depression and some other CMCs such as cardiovascular conditions may cause more anxiety.<sup>2</sup>

**Table 1.** Descriptive Data Overall and by Ethnicity

	Latinos (n=118)		African Americans (n=616)		All (N=734)		P Value
	Mean	SD	Mean	SD	Mean	SD	
Age	73.36	6.396	74.00	7.004	73.90	6.910	NS
Years of education	7.73	4.300	12.71	2.313	11.91	3.285	*
Chronic disease	3.92	2.163	4.07	2.026	4.05	2.048	NS
	N	%	N	%	n	%	
Gender							
Male	42	35.6	215	34.9	257	35.0	NS
Female	76	64.4	401	65.1	477	65.0	
Living alone							
No	77	65.3	246	39.9	323	44.0	*
Yes	41	34.7	370	60.1	411	56.0	
Medicare insurance							
No	31	26.3	169	27.4	200	27.2	NS
Yes	87	73.7	447	72.6	534	72.8	
SRH							
Good	113	95.8	583	94.6	696	94.8	NS
Poor	5	4.2	33	5.4	38	5.2	

Abbreviations: SRH, self-rated health; NS: Non-significant.

\*  $P < 0.05$  for comparison of Latino and African American  
No missing data.

African Americans' health paradox holds if when we compare African Americans and Latinos. This finding is unique as it extends what we know from such limited literature to variation across diverse ethnic groups other than African American-White differences. This is an interesting finding, as the African Americans' health paradox has been validated for decades, when compared with Whites.<sup>43-45</sup> These studies, however, have mainly recruited African American and White individuals,<sup>7-14</sup> thus less is known about potential differences between African American and Latino individuals in this regard. Despite CMCs being risk factors for depression, anxiety and poor mental well-being, African American individuals with chronic conditions continue to have better subjective health. This is indicative that higher number of CMCs does not similarly translate to poor SRH and poor wellbeing for African Americans, compared to Whites and Latinos.<sup>7-14</sup> While the impact of number of CMCs on SRH is stronger for Latinos and Whites, African Americans with multiple CMCs maintain their subjective health.

As mentioned before, a similar phenomenon is already shown for African American-White comparisons.<sup>7-14</sup> In cross-sectional and longitudinal studies, associations between number of CMCs and poor mental health are stronger for Whites than African Americans.<sup>7-14</sup> In one study that followed individuals for 25 years, the bidirectional effects of depression and chronic disease and disability were mainly present for White but absent for African American individuals.<sup>46</sup> In another study that followed individuals for 25 years, emergence of the African American-White mental-physical health paradox was observed over time.<sup>16</sup> As these

comparative studies are mainly done with African American and White individuals, we were not aware of any comparative study of African American and other non-White control group. This is the major contribution of this study to the literature.

Three explanations can be proposed for our observed ethnic variation. First is a systemic resilience of African American populations, particularly African American older adults. Keyes,<sup>17</sup> and Mezuk et al,<sup>15</sup> have explained this phenomenon as preparedness of African American people in facing adversities. This is also supported in African Americans' being prepared to negate some effects of depression with lower stress.<sup>47</sup> It may be inferred that African Americans, who faced long histories of institutionalized and structural racism and discrimination, have learned to cope with adversities and fewer resources.<sup>48,49</sup> The second explanation of this phenomenon is that the subjective/mental health of African Americans may not be directly affected from chronic diseases, in comparison to sociodemographic factors.<sup>50</sup> This aligns with the theory of diminished returns, which purports that resources do not equate in positive outcomes for marginalized groups who are facing discrimination and racism.<sup>51-53</sup> In other words, racism may be detrimental for African American people, regardless of their chronic disease, so their expected effect of chronic disease is weakened.<sup>51-53</sup> In one study, self-efficacy improved health of Whites, but not African Americans. Another study showed that sense of control over life had a weaker health effect for African Americans than Whites, while additional literature showed a stronger effect on happiness for White than African American people.<sup>54,55</sup> All these differential effects of similar factors may be attributed to structural and historical injustice and limited context and opportunities that greater affects African Americans.<sup>56,57</sup> The third explanation is that religion, spirituality, and social support is evidenced as beneficial for African Americans compared to other groups.<sup>58,59</sup> While some research has shown stronger protection of religion and social support for African American people,<sup>60-66</sup> some other studies by Mouzon and colleagues to discover the mechanisms of this resilience have failed to show a full explanation.<sup>67,68</sup> Religion/spirituality is shown to be very beneficial for African American people, including the mechanisms, such as prayer groups and phone line calls. Finally, Mezuk et al,<sup>15</sup> have proposed that African American people may use some health risk behaviors to maintain their subjective/mental health, however, some contrasting results are also shown.

This paper extends the literature on the links between ethnicity, SES,<sup>69</sup> subjective health,<sup>70</sup> and objective health.<sup>71</sup> Past research has shown that SRH differently reflect health of ethnic groups. Other studies have shown the complexity of the link between ethnicity, social status, SRH, and health.<sup>69-71</sup> This study suggests that SRH better reflects objective health needs of Latino than African American individuals.

### Implications

Researchers may not reduce ethnicity to a control variable. Ethnic differences are not all due to SES differences, and may

**Table 2.** Logistic Regression in the Overall Sample

	Model 1					Model 2						
	B	SE	OR	95% CI	P Value	B	SE	OR	95% CI	P Value		
African American	0.487	0.629	1.627	0.474	5.587	0.439	4.409	2.309	82.192	0.889	7596.050	0.056
Age (y)	-0.052	0.028	0.949	0.898	1.003	0.063	-0.048	0.028	0.953	0.902	1.007	0.088
Gender (male)	-0.084	0.374	0.920	0.442	1.914	0.823	-0.112	0.381	0.894	0.424	1.884	0.768
Years of education	-0.071	0.064	0.932	0.822	1.056	0.268	-0.072	0.064	0.931	0.822	1.055	0.262
Living arrangement (alone)	0.776	0.390	2.173	1.012	4.665	0.046	0.746	0.392	2.109	0.979	4.544	0.057
Medicare coverage (yes)	-0.165	0.380	0.848	0.403	1.785	0.665	-0.116	0.384	.891	0.420	1.889	0.763
Chronic disease	0.302	0.079	1.353	1.159	1.579	0.000	0.856	0.303	2.355	1.300	4.266	0.005
Chronic disease x ethnicity	-	-	-	-	-	-	-0.625	0.315	0.535	0.289	0.993	0.047

Model 1: Main effects.

Model 2: Main effects + Interaction.

**Table 3.** Logistic Regression in the Overall Sample

	Model 3					Model 4						
	B	SE	OR	95% CI	P Value	B	SE	OR	95% CI	P Value		
Age (y)	0.040	0.100	1.041	0.856	1.266	0.688	-0.062	0.030	0.940	0.886	0.997	0.040
Gender (male)	-0.604	1.630	0.546	0.022	13.329	0.711	-0.116	0.400	0.891	0.407	1.952	0.773
Years of education	0.051	0.125	1.053	0.824	1.345	0.682	-0.110	0.070	0.896	0.781	1.027	0.116
Living arrangement (alone)	0.330	1.404	1.391	0.089	21.817	0.814	0.988	0.444	2.686	1.124	6.417	0.026
Medicare coverage (yes)	-1.809	1.147	0.164	0.017	1.550	0.115	0.092	0.428	1.097	0.474	2.535	0.829
Chronic disease	0.968	0.346	2.631	1.336	5.182	0.005	0.224	0.085	1.251	1.059	1.479	0.008

Model 3: Latinos.

Model 4: African Americans.

also reflect culture, adjustment style, resilience, and coping mechanisms. Diverse ethnic groups with similar CMCs may have differential health needs, and same SRH may mean differently for various ethnic groups. Poor SRH may be indicator of very high number of CMCs in African Americans. Thus, health needs of African Americans who report poor SRH should be closely monitored. As SRH reflects different level of health needs, SRH is not a good measure/outcome for health disparities research.

### Limitations

Study limitations include non-randomized sample size, low sample size of Latino group, self-reported data on CMCs, no analysis of each type of chronic disease, and omitted variables that may confound our association of interest. This is a local study with non-random participants, so the results are not generalizable to the US sample. The samples of African American and Latino people were also not of same sample size, so the results may be biased because of higher power in African American than Latino individuals. Factors such as year of diagnosis, medications used, and adherence to medications may confound our association of interest. Finally, although self-reported data are commonly used to collect data on chronic diseases, validity of the results would be increased if we could confirm those conditions through medical record.

### Conclusion

Despite the existing association between number of CMCs

and poor SRH, this link is weaker for African American than Latino individuals. This finding supports the African Americans' health paradox, in which African Americans report better subjective health despite worse objective health. This pattern is not merely limited to the comparison of African Americans and Whites and holds with comparison of African Americans and similar under-resourced minority groups such as Latinos.

### Authors' Contributions

Study design: MB, data collection: MB, conceptual design: SA, data analysis: SA, prepare draft: BN, revision: SA, MB, BN. securing funding: MB. All authors approve the final draft.

### Conflict of Interest Disclosures

The authors have no conflicts of interest.

### Ethical Approval

Current study was approved by Charles R. Drew University of Medicine and Science (CDU IRB#: 14-12-2450-05). All participants provided written consent.

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## Research Highlights

**What Is Already Known?**

Objective and subjective health tend to covary.  
Ethnic groups may differ in the link between objective and subjective health.

**What Does This Study Add?**

SRH may mean differently for various ethnic groups.  
Poor SRH may be indicator of very high number of CMCs in African Americans.  
Health needs of African Americans who report poor SRH should be closely monitored.  
As SRH reflects different level of health needs, SRH is not a good measure/outcome for health disparities research..

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