Racial Discrimination in the Coronary Artery Risk Development in Young Adults (CARDIA) Study

Luisa N. Borrell, DDS, PhD
Columbia University
Department of Epidemiology
June 25th, 2007

Introduction
- Disparities in health status between blacks (or African Americans) and whites are large, pervasive, and persistent over time
- Socioeconomic position
- Existing research reveals that
  - A substantial proportion of African Americans experience discrimination
  - Discrimination is adversely related to multiple indicators of health status including poorer self-rated physical and mental health, blood pressure, and other cardiovascular outcomes as well as other health outcomes and related behaviors

Self-reported health, perceived racial discrimination and skin color in African Americans


Background
- Racial discrimination has emerged as an important risk factor for the health of African Americans
- Evidence suggests that skin tone may be a marker for discrimination, with darker skinned blacks reporting higher levels of discrimination than their lighter skinned peers

Aim of the Study
- To investigate the association of perception of racial discrimination and skin color with self-reported physical and mental health status in African Americans
Source of the Data
- The CARDIA study
  - A prospective study of cardiovascular risk factors
  - 5,115 African American and white adults 18-30 years of age recruited from 4 US urban areas in 1985-86, balanced on age, sex, race and education
  - Re-examined every 2-5 years, retention for Year 15 (2000-01): 74%
  - A sample of 1,722 African Americans

Outcomes
- Physical and Mental Health
  - Data collected during Year 15
  - SF-12: 12 questions representing two summary scores, the Physical Component Score (PCS) and the Mental Component Score (MCS)
  - Scores on scale from 0 (worst) to 100 (best)
  - Mean score for a healthy population is 50

Exposures
- Racial Discrimination
  - Data collected during Year 15
  - Self-reported experience of discrimination in 7 domains: at school, getting a job, getting housing, at work, at home, getting medical care, on the street or in a public setting
  - Answers for 7 domains added for a summary score
  - Range from 0 (no discrimination) to 21 (highest frequency/intensity of discrimination)

Exposures...
- Skin Color
  - Data collected during Year 7 follow up examination
  - By amber, blue, and green filters of a Photovolt 577 reflectance meter
  - Values pertain to percentage reflected light
  - Range from 0 (darkest) to 100 (lightest)

Covariates
- Age
- Marital status
- Education (years and degrees)
- Family income

Characteristics of the Study Population

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Women (n=1016)</th>
<th>Men (n=706)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete high school</td>
<td>66</td>
<td>9.7</td>
</tr>
<tr>
<td>Complete high school or GED</td>
<td>21.3</td>
<td>28.6</td>
</tr>
<tr>
<td>1-3 years of college</td>
<td>42.5</td>
<td>37.8</td>
</tr>
<tr>
<td>4 years of college</td>
<td>19.1</td>
<td>17.0</td>
</tr>
<tr>
<td>Some graduate or professional school</td>
<td>10.1</td>
<td>7.6**</td>
</tr>
<tr>
<td>Income (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$12,000</td>
<td>11.4</td>
<td>10.3</td>
</tr>
<tr>
<td>$12,000-$15,999</td>
<td>5.5</td>
<td>5.1</td>
</tr>
<tr>
<td>$16,000-$24,999</td>
<td>10.8</td>
<td>7.0</td>
</tr>
<tr>
<td>$25,000-$34,999</td>
<td>12.8</td>
<td>13.0</td>
</tr>
<tr>
<td>$35,000-$49,999</td>
<td>16.4</td>
<td>15.4</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>20.9</td>
<td>19.7</td>
</tr>
<tr>
<td>$75,000-$99,999</td>
<td>11.8</td>
<td>12.6</td>
</tr>
<tr>
<td>&gt;$100,000</td>
<td>8.2</td>
<td>12.7**</td>
</tr>
</tbody>
</table>

** p<0.01
Mean scores for physical and mental health at Year 15

<table>
<thead>
<tr>
<th></th>
<th>Physical Health</th>
<th>Mental Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>51.2†</td>
<td>51.1‡</td>
</tr>
<tr>
<td>Men</td>
<td>50.1†</td>
<td>51.5†</td>
</tr>
</tbody>
</table>

Mean skin color reflectance by tertile at Year 7

<table>
<thead>
<tr>
<th></th>
<th>Lowest (Darkest)</th>
<th>Middle</th>
<th>Highest (Lightest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>24.3</td>
<td>32.2</td>
<td>43.5</td>
</tr>
<tr>
<td>Men</td>
<td>34.4</td>
<td>40.3</td>
<td>25.2</td>
</tr>
</tbody>
</table>

Racial discrimination at Year 15 and race/ethnicity: Prevalence (any versus none) and mean score

<table>
<thead>
<tr>
<th></th>
<th>Prevalence</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>78.1</td>
<td>4.58</td>
</tr>
<tr>
<td>Men</td>
<td>73.2</td>
<td>4.25</td>
</tr>
</tbody>
</table>

Average change in physical and mental health score per unit increase in the racial discrimination summary score

<table>
<thead>
<tr>
<th></th>
<th>PCS</th>
<th>MCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>-0.16 (-.26, -.04)</td>
<td>-0.52 (-.67, -.37)</td>
</tr>
<tr>
<td>Men</td>
<td>-0.14 (-.27, -.00)</td>
<td>-0.29 (-.45, -.14)</td>
</tr>
</tbody>
</table>

Additional Results

- Skin color was not associated with physical or mental health.
Additional Results...

- The association between discrimination and MCS varies with income among women.
  - In women with income of less than $16,000, between $16,000 to $34,999 and $35,000 to $74,999, a one unit increase in the discrimination scale was associated with a decrease of 0.77, 0.65 and 0.60 in the mean MCS score, respectively.

Limitations

- Cross-sectional data
- Self-reported nature of the data could lead to same-source bias
- Measurements of skin color were taken eight years before the discrimination and health assessment.

Conclusions

- Racial discrimination was reported in 75% of participants, but was more common in men than in women.
- Racial discrimination was associated with worse physical and mental health in both men and women.
  - These associations were stronger for women than for men.

Self-reported racial discrimination and substance use in the Coronary Artery Risk Development in Adults (CARDIA) study

Borrell LN, Jacobs DR, Williams DR, Pletcher MJ, Houston TJ, Kiefe CI. American Journal of Epidemiology (Article accepted for publication)

Background

- Although the associations between racial discrimination and health outcomes have been reported consistently, the causal mechanism underlying these associations remains a challenge.

Aim of the Study

- To investigate the association of self-reported racial discrimination with cigarette smoking, alcohol consumption, and use of illicit substances among African American and white adults.
Methods

- CARDIA Study
  - African American (n=1507)
  - Whites (n=1822)
- Outcomes
  - Smoking status, alcohol consumption, and lifetime use of illicit substances (marijuana, cocaine, crack, heroin and speed) ascertained at Year 15
- Racial Discrimination at Years 7 and 15

Covariates

- Age
- Sex
- Marital status
- Education (years and degrees)
- Family income
- Coping mechanisms for unfair treatment
- Control/mastery
- Anger
- Social network
- Social support

Prevalence of racial discrimination by race/ethnicity

- African Americans
- Whites

Prevalence of substance use according to racial discrimination and race/ethnicity

- African American
- African American
- White
- White

Limitations

- Self-reported nature of the data could lead to same-source bias
- The associations of racial discrimination with smoking, alcohol consumption and lifetime substance use were determined in cross-sectional and longitudinal analyses
Conclusions

- Racial discrimination was:
  - More common in African Americans (89%) than in whites (38%) when queried 8 years apart
  - Associated with smoking, past year alcohol consumption and lifetime use of marijuana and cocaine in both racial/ethnic groups

Implications for Future Research

- Our findings suggest:
  - We need to move beyond reporting the effect of self-reported perceived racial discrimination on health outcomes
  - We should focus on the etiologic mechanisms, upstream and downstream, by which racial discrimination may exert its effects on health

Acknowledgements

- This work was supported by:
  - National Institutes of Health (NHLBI & NIDCR)
  - Robert Wood Johnson Health and Society Scholars Program
  - We thank the staff and participants in the CARDIA study for their important contributions