Perceived Reactions to Race and Health Status in the Massachusetts Behavioral Risk Factor Surveillance System Survey

Rachael B. Zuckerman, MPH; Liane J. Tinsley, MPH; Helen Hawk, PhD; Bruce Cohen, PhD

Objectives: Evaluate the relationship between race, perceptions of personally mediated racism and health outcomes in the Massachusetts Behavioral Risk Factor Surveillance System (BRFSS).

Methods: Regression analysis of 8,266 respondents to the Reactions to Race module in 2006 and 2008. Questions assessing personally mediated racism were combined to measure perceptions of reactions to race.

Outcome Measures: Adjusted odds ratios and 95% CI of perceived personally mediated racism, self-reported overall health, life satisfaction, health risks (smoking status, obesity, binge and heavy drinking), and preventive services (colonoscopy, flu vaccine).

Results: Black non-Hispanic respondents are 10.4 times (95% CI: 6.3–17.3; $P<.001$) and Hispanics 5.8 times (95% CI: 3.6–9.4; $P<.001$) more likely to report being treated worse than other races compared to White non-Hispanic respondents. Respondents of all races reporting being treated worse than other races are 3.2 times (95% CI: 1.9–5.4; $P<.001$) more likely to have fair/poor health and 4.1 times (95% CI: 2.1–7.9; $P<.001$) more likely to report life dissatisfaction than those treated the same or better than other races. There is no statistically significant association between perceived personally mediated racism and health risks or preventive services tested.

Conclusions: Perceptions of personally mediated racism are significantly associated with fair/poor overall health and life dissatisfaction, but none of the health risks or preventive services tested. (*Ethn Dis*. 2012;22[4]:492–496)

Key Words: Behavioral Risk Factor Surveillance System, Massachusetts, Prejudice, Health Status Disparities, Race/Ethnicity

From Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health (RBZ), and the Health Survey Program (LJT, HH), and Health Information, Statistics, Research and Evaluation (BC) of the Massachusetts Department of Public Health.

Address correspondence to Liane J. Tinsley, MPH; New England Research Institutes, 9 Galen Street, Watertown, MA 02472; 617-923-7747; 617-924-0968 (fax); ltinsley@neriscience.com

Introduction

The existence of disparities in health outcomes by race in the United States has been established, yet the underlying health-related cause of these disparities is not well understood. One possible explanation is a link between minority groups' experiences of racism and overall health, mental health, and health behaviors.[1–3] In order to better understand the relationship between perceived racism and health in Massachusetts, the Commonwealth included a Reactions to Race module in the 2006 and 2008 versions of the Behavioral Risk Factor Surveillance System (BRFSS), a national health survey administered by each state and representative of the state's population.

The questions in the BRFSS measure two different levels of racism: personally mediated racism (prejudice and discrimination) at the interpersonal level and internalized racism (groups' acceptance of their own worth) at the individual level. Personally mediated racism is expressed as how individuals are treated, and can be a lack of respect, suspicion, scapegoating, or other actions that result in different races being treated differently. Internalized racism, on the other hand, is conducted by members of the same race and involves believing that they and other members of their race are limited in ways that more privileged races are not.[4] In this study, we focused specifically on personally mediated racism.

Experiences of personally mediated racism and health have been explored in previous publications, and even within multi-state analyses of BRFSS data.[5–12] These previous BRFSS analyses have analyzed two questions; one focusing on experiences in health care settings and the other with a focus on experiences at work. Using data from the Massachusetts BRFSS collected in 2006 and 2008, we combined the two questions to create a single overall measure of individual experiences of personally mediated racism by combining workplace and health care settings. Given that an individual's health can be affected by all of his or her daily experiences, not just experiences in specific situations, our analysis adds to the current literature by showing the effects of cumulative, rather than direct, perceptions of reactions to race. This analysis evaluated the relationship between an individual's race, perceptions of personally mediated racism and two different health outcomes: self-reported overall health and life satisfaction. Additionally, we sought to determine whether poorer risk behaviors were related to overall poorer health status in persons who perceived being treated worse than other races. We hypothesized that certain races would be more likely to have experienced racism and also that experiences of racism would be negatively associated with the overall health outcome measures. Furthermore, we wanted to examine whether reporting poorer overall health could be explained by known disease risk factors such as obesity, cigarette smoking, and alcohol consumption.

Methods

Data Collection

The BRFSS is an annual telephone survey that collects data on emerging

…our analysis adds to the current literature by showing the effects of cumulative, rather than direct, perceptions of reactions to race.

public health issues, health conditions, risk factors and behaviors.[13] In 2001, the Centers for Disease Control and Prevention (CDC) Measures of Racism Working Group developed a Reactions to Race module for the BRFSS. This module asks about respondents' own perceived race, their perceptions of experiences of reactions to race at work or in a health care setting, and how these reactions affected their overall health and life satisfaction. Additionally, questions regarding health in general are asked in other sections of the survey. The module was tested extensively before being made available to all states in 2004.[11]

The 2006 and 2008 versions of the Massachusetts BRFSS were landline telephone surveys of non-institutionalized adult residents of the Commonwealth. The Massachusetts average annual sample size is about 16,000 respondents.

In both the 2006 and the 2008 Massachusetts BRFSS, the Reactions to Race module was administered to a subset of the total BRFSS sample, with about 8,000 respondents asked these questions over the two years. In 2006, the module oversampled minority respondents in order to obtain better information about the non-White population group, while in 2008 the module was administered to a randomly selected subsample. In 2006, the Reactions to Race module was administered to 1 in 4 White, non-Hispanic BRFSS survey respondents and all other respondents. In 2008, the module was administered to one third of all BRFSS survey respondents, randomly selected. The 2006 and 2008 respondents for the Reactions to Race module have minimal differences in sex, age, overall health, smoking status, prevalence of overweight, and use of preventive services. Since we did not find any systematic differences in samples, we conducted all analyses on the combined data set.

Statistical Analysis

Our analysis pursued two goals: to assess the relationship between race and perceptions of personally mediated racism; and to assess the relationship between experiences of personally mediated racism and overall health, health risks, and use of preventive services.

We first examined relations between an individual's race and the perception of being treated worse than other races. Additionally, we evaluated the relationship between perceptions of reactions to race and overall health status, overall life satisfaction, health risks (smoking status, obesity, binge drinking and heavy drinking), and use of two preventive services (colonoscopy and flu vaccine). We used logistic regression models (SAS ver. 9.1.3) for sampling analyses, controlling for age, sex, education, and marital status.

In order to obtain a more comprehensive measure of personally mediated racism, we combined two questions about race-based treatment: ''Within the past 12 months at work, do you feel you were treated worse than other races, the same as other races, better than other races, or worse than some races but better than others?'' and ''Within the past 12 months, when seeking health care, do you feel your experiences were worse than other races, the same as other races, better than other races, or worse than some races but better than others?'' for all of our analyses except those evaluating the use of preventive services, leaving us with a single question asking how respondents were treated at work and in health care settings. (For more information on how questions were combined, contact the corresponding author.)

We divided responses into two categories, one for respondents who reported being treated worse than other races and the other for respondents who reported being treated better, the same, or better than some races and worse than others (subsequently referred to as the same or better than other races). For the use of preventive services we confined our analysis to treatment in the health care setting.

We used two questions measuring overall health and satisfaction. Specifically, ''Would you say that in general your health is excellent, very good, good, fair, or poor'' and ''In general, how satisfied are you with your life? Very satisfied, satisfied, dissatisfied, or very dissatisfied.''

For the analyses of health risks and use of preventive services, being obese was defined as a BMI>30. Binge drinking was defined as having ≥5 drinks at one time at least once in the past month and heavy drinking as ≥60 drinks in the last month for men and ≥30 for women. The preventative services examined were colonoscopy in the past 5 years (aged ≥50) and seasonal flu vaccine in the past year (aged ≥50). Although more preventive services are covered in the BRFSS, we were only able to evaluate those with the largest sample sizes, and unable to evaluate any sex-specific screening procedures due to the smaller size of the sample asked the Reactions to Race questions.

Education was used throughout the analyses as a proxy for socioeconomic status. We used the stepwise regression method, adding potential covariates to assess their influence on the model, and combined as many significant covariates as sample sizes would allow for the final models.

RESULTS

In 2006, 5,548 BRFSS respondents completed the Reactions to Race mod-

Table 1. Experiences of personally mediated racism by race

Treatment as Compared to Other Races[a]	White NH			Black NH			Hispanic		
	n	Weighted %	(95% CI)	*n*	Weighted %	(95% CI)	*n*	Weighted %	(95% CI)
Worse	95	1.36%	(1.0–1.8%)	100	12.58%	(8.1–17.1%)	122	7.45%	(4.9–10%)
The same	3509	77.63%	(75.7–79.5%)	499	64.27%	(58–70.6%)	1124	75.08%	(71–79.2%)
Better	798	17.45%	(15.8–19.1%)	59	7.65%	(4.8–10.5%)	173	9.01%	(6.8–11.2%)
Worse than some, better than others	158	3.56%	(2.6–4.5%)	112	15.49%	(10.5–20.4%)	104	8.46%	(5.6–11.3%)
Total	4560			770			1523		

[a] Treatment in the workplace or health care settings.

ule, and 2,718 completed it in 2008 for a total of 8,266 respondents. The Reactions to Race module questions are available online from the CDC.[14] Most respondents answered all questions in the section (data not shown).

Among all respondents, only 347 (3.4% when weighted for the general population) reported being treated worse than other races either in the workplace and/or in a health care setting. Most respondents (5,586; 76.2%) reported being treated the same as other races, while 1,088 (14.5%) reported being treated better than other races and only 431 (5.9%) reported being treated better than some races but worse than others. The proportion of respondents who said that they were treated worse than other races was significantly higher for Blacks and Hispanics than Whites (Table 1).

We examined the relationship between perceptions of reactions to race and an individual's self-reported race. In the logistic regression model, Blacks were more than 10 times, and Hispanics almost 6 times more likely to report being treated worse than other races in workplace or health care settings. None of the covariates tested (age, sex, or educational status) were significant in the model (Table 2).

To assess the relationship between perceptions of reactions to race and overall health status, we used two different outcome variables: overall health and overall life satisfaction. There was a statistically significant relationship between the perception of being treated worse than other races and fair or poor health; respondents who reported being treated worse than other races were greater than 3 times more likely to have fair or poor health than those treated the same or better than other races. There was also a significant association between perceptions of reactions to race and overall life satisfaction. Individuals who perceived being treated worse than other races in the workplace or health care settings were more than 4 times more likely to be dissatisfied than those treated the same or better than other races (Table 3).

To evaluate the role of specific health risk behaviors as a possible cause of reporting poorer overall health by those who perceived being treated worse than other races, we examined the relations between perceived racism and obesity, smoking, binge drinking, and heavy drinking. In all cases, individuals who reported being treated worse than other races were not more likely to have a statistically significant increase in health risks (Table 3).

We also examined the relationship between perceptions of reactions to race in the health care setting and receiving two preventive health services: colonoscopy with the past 5 years and flu vaccination in the past year. Since these services are typically provided in a health care setting, we used the question asking whether a respondent had been treated worse than other races in health care settings rather than the combined question. Neither was statistically significant (Table 3).

Table 2. Adjusted odds ratios for persons of each race reporting being treated worse than other races

	Treated Worse than Other Races		
	OR	95% CI	*P*
White non-Hispanic	1.00		
Black non-Hispanic	10.43	6.3–17.3	<.001
Hispanic	5.84	3.6–9.4	<.001

DISCUSSION

The results of this analysis suggest that there is a significant association between an individual's race and his or her perception of being treated worse than other races. This perception of poorer treatment is negatively associated with self-identified health status. However, this negative association was not explained by individual health risks or, for those aged >50, the use of two preventive services in our sample.

Overall, Blacks and Hispanics in Massachusetts were more likely to perceive being treated worse than other

Table 3. Adjusted odds ratios for persons reporting being treated worse than other races

	When Treated Worse than Other Races			
	OR	95% CI	*P*	Covariates[a]
Overall health				
Fair/poor overall health	3.18	1.9–5.4	<.001	age, education
Overall life dissatisfaction	4.05	2.1–7.9	<.001	education, marital status
Health risk				
Obese	1.16	.8–1.7	.5	education
Current smoker	1.27	.8–2.1	.4	education
Bingeing[b]	.83	.5–1.5	.5	age
Heavy drinking[c]	1.14	.5–2.7	.8	age
Use of preventive services (age≥50)				
Colonoscopy in the last 5 years	.86	.5–1.4	.6	education
Flu vaccine in the last year	.61	.4–1.0	.1	sex, education

[a] Not all covariates could be added to all models due to small cell sizes.
[b] Having ≥5 drinks at one time at least once in the past month.
[c] Having ≥60 drinks in the last month for men and ≥30 for women.

races as compared to Whites. Two previous studies also looked at the relationship between self-perceived race and reactions to race across states in 2004, and both found statistically significant associations, but with lower odds ratios, than our analysis.[8,9]

We found a statistically significant association between perception of being treated worse than other races and two measures of health status: fair or poor overall health and overall life dissatisfaction. According to a multi-state analysis of the 2004 BRFSS, respondents who perceived being treated worse than other races in health care settings were more likely to have fair or poor health than those who were treated the same or better than other races, but again this association was not as strong as ours.[9]

Overall, Blacks and Hispanics in Massachusetts were more likely to perceive being treated worse than other races as compared to Whites.

The higher odds ratios in our study may be a result of using a combined variable that incorporates perception of race-based treatment in both health care and workplace settings as our independent variable. Combining these two settings provides respondents with more opportunities to express being treated worse than other races.

We were also able to assess the relationship between perceptions of reactions to race to determine if personal health risks such as obesity, smoking, drinking and not using preventive health services could explain why those who perceive racism were more likely to report overall poorer health. Our findings suggest that these factors do not account for overall poorer health, implying that perceived racism is a risk factor that operates independently from these known health risks to yield overall poorer health. Although we did have a small sample to evaluate this, our findings are consistent with previous studies that found no statistically significant association between the perception of being treated worse than other races and forgoing preventive care.[5,7,10]

The Reactions to Race module was extensively tested; however, all of the questions used in our analysis are subject to the limitations of self-report of sensitive data. Limitations of the BRFSS sampling and survey methodology are discussed elsewhere.[15]

In our analysis, the small sample size of 347 respondents who felt that they were treated worse than other races limited the number of confounding variables that could be added to each model. Additional covariates may have confounded the relationship we observed, including characteristics of respondents' employers (age, race, and sex), respondents' comorbid conditions, or respondents' time in the United States. Some of these covariates are included in the BRFSS, and a larger sample of Massachusetts residents over a longer period of time would better allow us to control for potential confounders in our regression models. Additionally, the vast majority of respondents were White, Black, or Hispanic, and we did not have large enough sample sizes to include other races in any analyses.

As compared to previous analyses, our findings using a combined measure of personally mediated racism mirror the findings of other separate measures of racism, with our analysis showing a stronger link between experiences of racism and health measures. Although the two questions capture different circumstances of workplaces and seeking

health care, we believe that combining the questions provides a more complete picture of individual respondents' perceptions of personally mediated racism. The differences between our findings and those measuring experiences of racism either in the workplace or health care settings were greatest for measures of overall health. The combined question shows a stronger relationship between the perception of being treated worse than other races and overall health status, perhaps reflecting the complexity of the interactions with personally mediated racism.

In line with previous analyses, we did not find an association between experiences of personally mediated racism and health risks. Although the health risks and preventive services tested are known to contribute to overall health, according to our analysis they do not affect the relationship between personally mediated racism and health status.

This is the first time that Massachusetts residents' responses to the Reactions to Race module have been evaluated, as all previously published studies focus on the results of the 2004 BRFSS, before Massachusetts started administering the module. With more data gathered over a longer period of time, we will be able to monitor changes over time in both perceived racism and its association to health. We may also be able to better understand the health effects with a larger sample size of individuals who have perceived racism.

One of the primary goals of the Massachusetts Department of Public Health is to eliminate health disparities across racial groups, and the increased understanding of these disparities that our analysis provides can help with this goal. Specifically, it reinforces the importance of programs to address discrimination, as it is associated with disparities in overall health and life satisfaction. Collecting data on perceived personally mediated racism allows the state to monitor trends and evaluate the effectiveness of policies aimed at reducing racism and racial health disparities.

ACKNOWLEDGMENTS

We gratefully acknowledge Dr. Virginia Chomitz at Tufts University, the faculty advisor for this project, who provided guidance and feedback throughout the project planning, data analysis and interpretation phases.

REFERENCES

1. Brandolo E, Gallo LC, Myers HF. Race, racism and health: disparities, mechanisms, and interventions. *J Behav Med*. 2009;32:1–8.
2. Paradies Y. A systematic review of empirical research on self-reported racism and health. *Int J Epidemiol*. 2006;35:888–901.
3. Williams DR, Neighbors HW, Jackson JS. Racial/ethnic discrimination and health: findings from community studies. *Am J Public Health*. 2003;93(2):200–208.
4. Jones CP. Levels of racism: a theoretic framework and a gardener's tale. *Am J Public Health*. 2000;90(8):1212–1215.
5. Asrabadi A. *Reactions to Race and Cancer Screening Utilization.* [master's thesis]. Fort Worth, Tex: University of North Texas; 2006.
6. Crawford ND, Jones CP, Richardson LC. Understanding racial and ethnic disparities in colorectal cancer screening: Behavioral Risk Factor Surveillance System, 2002 and 2004. *Ethn Dis*. 2010;20:359–365.
7. Crawford ND, Jones CP, Richardson LC. Understanding the role of reactions to race-based treatment in breast and cervical cancer screening. *J Natl Med Assoc*. 2008;100(2):188–196.
8. Fujishiro K. Is perceived racial privilege associated with health? Findings from the Behavioral Risk Factor Surveillance System. *Soc Sci Med*. 2009;86:840–844.
9. Hausmann LRM, Jeong KW, Bost JE, Ibrahim SA. Perceived discrimination in health care and health status in a racially diverse sample. *Med Care*. 2008;46(9):905–914.
10. Hausmann LRM, Jeong KW, Bost JE, Ibrahim SA. Perceived discrimination in health care and use of preventive health services. *J Gen Intern Med*. 2008;23(10):1679–1684.
11. Jones CP, Truman BI, Elam-Evans LD, et al. Using ''socially assigned race'' to probe White advantages in health status. *Ethn Dis*. 2008; 18:496–504.
12. Ridings CC, Rafferty AP, Weir S. *Reactions to Race: Analysis from Michigan and Wisconsin. Michigan BRFSS/Health Disparities Surveillance Brief.* Lansing, Mich: Michigan Department of Community Health, Chronic Disease Epidemiology Section; January 2010.
13. Commonwealth of Massachusetts. Health Survey Program. www.mass.gov/dph/hsp. Accessed June 29, 2011.
14. Centers for Disease Control and Prevention. BRFSS Historical Questions – Results. apps.nccd.cdc.gov/BRFSSQuest/ResultsV.asp? StartPg = 1&EndPg=10&TopicID=57&fromyr = Any&toyr=Any&Text=&Join=AND&SUBMIT1= +Go. Accessed July 20, 2011.
15. Massachusetts Department of Public Health. BRFSS Methodology. www.mass.gov/Eeohhs2/docs/dph/behavioral_risk/methodology.pdf. Accessed July 20, 2011.

AUTHOR CONTRIBUTIONS

Design and concept of study: Zuckerman, Tinsley, Hawk, Cohen
Data analysis and interpretation: Zuckerman, Tinsley, Hawk, Cohen
Manuscript draft: Zuckerman, Tinsley, Cohen
Statistical expertise: Zuckerman, Tinsley, Hawk, Cohen
Supervision: Hawk, Cohen