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The Effects of Discrimination are Associated with Cigarette Smoking among Black Males

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Abstract

Introduction: Previous research has demonstrated that experiencing interpersonal discrimination is associated with cigarette smoking. Few studies have examined the relationship between the effects of physical and emotional discrimination and cigarette usage, and none have examined this relationship among Black men. The aim of this study was to examine the association between the effects of physical and emotional discrimination and cigarette smoking.

Methods: Data from the Indiana Black Men's Health Study, a community-based sample of adult Black men, was used to conduct multivariate logistic regression to examine the relationship between the physical *and* emotional effects of discrimination and smoking, net of healthcare *and* workplace discrimination, age, education, household income, and being married.

Results: After adjusting for having an emotional response to discrimination, health care *and* workplace discrimination, age, education, household income, and being married, males who had a physical response to discrimination (e.g. upset stomach or headache) had higher odds of cigarette

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Declaration of Interests

None declared.

use (OR: 1.95, 95% CI: 1.15–3.30) than men who did not have a physical response to discrimination.

Conclusion: Findings from the study suggest that Black males may use cigarette smoking as a means to mitigate the stress associated with experiences of discrimination. Future research is needed further to explore if and how Black males use cigarette smoking to cope with unfair treatment.

INTRODUCTION

Smoking is the leading cause of preventable death, associated with 1 in 5 deaths in the United States (U.S.) (Danaei et al., 2009). In addition to death, smoking is the leading cause of adverse cardiovascular conditions, respiratory disease, and several forms of cancer (United States Department of Health Human Services, 2014). National statistics suggests that there are negligible racial/ethnic differences in smoking use among men (Jamal et al., 2014). Data from the 2013 National Health Interview Study reveal that 21.8% of Black men and 21.2% of White men are current cigarette smokers (Jamal et al., 2014). While the smoking rates between Black and White men are comparable, Black men are disproportionately affected by smoking related health outcomes (e.g., heart disease and lung cancer) (Haiman et al., 2006; Mozaffarian et al., 2015; Schiller, Lucas, Ward, & Peregoy, 2012; Siegel, Naishadham, & Jemal, 2012). Black men have a higher incidence and mortality rate from lung cancer than White men (Haiman et al., 2006; Siegel et al., 2012), and across the life course Black men have a higher incidence rate of fatal coronary heart disease compared to White men (Mozaffarian et al., 2015). Further, using data from the National Health and Nutrition Examination Survey (NHANES III), Thorpe and colleagues determined that Black males who smoke compared to those who do not smoke have an increased risk of mortality regardless of age (Thorpe et al., 2013).

Previous research has examined the role of interpersonal discrimination on cigarette usage (Bennett, Wolin, Robinson, Fowler, & Edwards, 2005; Borrell et al., 2007; Chae et al., 2008; Guthrie, Young, Williams, Boyd, & Kintner, 2002; Purnell et al., 2012; Shariff-Marco, Klassen, & Bowie, 2010; Parker, Kinlock, Chisolm, Furr-Holden, & Thorpe Jr, 2016). It is proposed that cigarette smoking is an externalized coping mechanism used to alleviate psychosocial stressors like discrimination (Paradies, 2006; Williams, 2003; Williams & Mohammed, 2009). Such research findings have demonstrated that in addition to racial discrimination, unfair treatment in the workplace and while seeking health care due to race are associated with cigarette smoking (Borrell et al., 2010; Chavez, Ornelas, Lyles, & Williams, 2015; Landrine, Klonoff, Corral, Fernandez, & Roesch, 2006; Okechukwu et al., 2010; Purnell et al., 2012; Shariff-Marco et al., 2010). However, what is less understood within the discrimination and smoking literature is the association between physical (e.g. upset stomach or headache) and emotional (e.g. anger or sadness) responses to discrimination and cigarette smoking. Using data from the Behavioral Risk Factor Surveillance System (BRFSS) survey, findings from Purnell and colleagues (2012) demonstrated that emotional and physical responses to discrimination are positively associated with smoking in a national probability sample of White, Hispanic and Black men and women. While this sole study offers insight on the relationship between the effects of

discrimination and smoking in a general population sample of adults, a more explicit investigation is warranted that specifically focuses on Black men given their disproportionate experiences of discrimination (Forman, Williams, Jackson, & Gardner, 1997; Krieger et al., 2006; Rich & Roe, 2002; Williams, 2003). think are necessarily true. o well and they make some connections that I don't stress, but that smoking actually revs up the bo Due to unique racialized and gendered factors that Black men endure (Bruce, Griffith, & Thorpe, 2015; Griffith & Thorpe Jr, 2016), they may be susceptible to cigarette use to abate stress (Parker et al. 2016).

Compared to Black women, Black men report higher levels of chronic and acute discrimination (Forman et al., 1997). Further, Black men also live with greater structural inequality that might increase their access to tobacco and increase the likelihood of them becoming smokers (Williams, 2003). For example, Black men are more likely than White men to live in communities characterized by crime and poverty (Rich & Roe, 2002; Thorpe Jr et al., 2015; Thorpe et al., 2013) societal characteristics that have been demonstrated to be associated with disproportional tobacco marketing and tobacco outlet density (Fakunle, Morton, & Peterson, 2010; Laws, Whitman, Bowser, & Krech, 2002; Loomis, Kim, Goetz, & Juster, 2013; United States Department of Health Human Services, 2014; Widome, Brock, Noble, & Forster, 2013) As a means to means to cope with physical and emotional responses resulting from social and economic adversities, Black men may turn to cigarette smoking.

It is important to identify if physical and emotional responses to discrimination are associated with Black men's cigarette use, as their cigarette smoking in response to psychosocial stressors may, in part, explain their high morbidity and mortality from smoking-related diseases (Haiman et al., 2006; Jamal et al., 2014; Mozaffarian et al., 2015; Schiller et al., 2012; Siegel et al., 2012; United States Department of Health Human Services, 2014). Based on Pearlin's Stress Process Model, which proposes that social stressors influence health and illness, it is hypothesized that Black men smoke as a means to cope with unfair treatment (Pearlin, Menaghan, Lieberman, & Mullan, 1981). According to Pearlin, the influence of social stressors on health, be it a major life event or chronic stressor, can be mediated by coping mechanisms (Pearlin & Schooler, 1978; Pearlin et al., 1981). It is difficult to identify a coping response, as often there is nothing intrinsic to the behavior used for this function (Pearlin et al., 1981). Smoking, however, is a common method that many identify as a means to relieve stress (Pearlin & Schooler, 1978). Accordingly, the purpose of the study is to determine the association between the effects of discrimination (physical and emotional), and current cigarette smoking among Black men.

METHODS

Sample

Data from the Indiana Black Men's Health Study (BMHS) was used for this study. The BMHS is designed to identify social-determinants that affect Black men's health, opportunities and initiatives to prevent chronic health conditions, and gaps in awareness, access, and utilization of health services. As part of a health-needs assessment conducted by the Indiana Minority Health Coalition, Inc., adult (ages 18 years old) Black men from 11 counties known to have relatively high proportions of Black male residents participated in

the study. Trained members of the community used convenience and a non-probability form of snowball sampling to recruit self-identified African American/Black men from various community setting (basketball courts, community centers, etc.) (Sadler, Lee, Lim, & Fullerton, 2010). Data collection was completed between July and August of 2011 using self-administered paper-pencil surveys. Participants had the opportunity to complete 2 surveys that consisted mainly of questions from the Behavioral Risk Factor and Surveillance System (BRFSS) (United States Department of Health Human Services, 2012). Verbal consistent was obtained from all participants, and each participant was given a \$15 gift card for each completed survey. The data collection process was approved by the Institutional Review Boards at Purdue University and Indiana University.

The first survey (Survey A) consists of questions related to general health and use of health services, and the second survey (Survey B) consists of questions related to perceived discrimination and help-seeking behaviors. Although potential respondents had the opportunity to complete both surveys, some elected to complete only one (survey A n =1,444; survey B n = 1,151). However because not all of the respondents completed both surveys and each survey was anonymous, we employed an automated matching process using the following demographic variables that was assessed on both surveys: respondent's age, education, income, employment, race, and marital status. Only those surveys that matched 1:1 was retained for this study (n = 779).

Study Measures

Outcome variable.—Current cigarette use was the outcome of interest. The answer to the following 2 items was used to assess smoking status, “Have you smoked at least 100 cigarettes in your life?” (“yes,” “no,” “do not know”) and “Do you currently smoke?” (“yes,” “no,” “do not know”). Men who responded yes to the 2 items were coded as “current smoker.” Men who responded “yes” to the first item but “no” to the second, and those who responded “no” to both items were coded as “non-smoker.”

Independent variables.—The effect of discrimination was the main independent variables of interest. The following two items were used to assess the emotional and physical effects of discrimination: “Within the past 30 days, have you experienced any physical symptoms, for example, a headache, an upset stomach, tensing of muscles, or a pounding heart as a result of how you were treated based on your race?” and “Within the past 30 days, have you felt emotionally upset, for example angry, sad, or frustrated as a result of how you were treated based on your race?” The possible responses to both of the items were “yes,” “no,” “do not know,” or “I do not want to say.” For both items, the response “yes” was coded as having a physical symptom or emotional symptom in response to discrimination, and “no” was coded as not having a physical or emotional symptom. The response options “don’t know” (n= 62, n= 65, respectively) and “I do not want to say” (n= 31, n = 31, respectively) were coded as missing, since they did not have a strong favorable or unfavorable effect due to treatment.

Covariates.—The covariates included perceived discrimination and several demographic variables. Perceived discrimination was assessed in 2 domains, workplace and health care

setting. The following two items were used, “within the past 12 months at work, do you feel you were treated worse than, the same as, or better than people of other races?” and “within the past 12 months, when seeking health care, do you feel you were treated worse than, the same as, or better than people of other races?” The responses were: 1) worse than other races, 2) the same as other races, 3) better than other races, 4) worse than some races better than other races, and 5) only encountered people of the same race. Following the work of previous studies (Crawford, Jones, & Richardson, 2010; Hausmann, Jeong, Bost, & Ibrahim, 2008; Parker, Hunte, & Ohmit, 2015), for both items, the response “worse than other races” was coded as experiencing healthcare discrimination, and “the same as, or better than people of other races” and “better than other races” were coded as not experiencing healthcare discrimination in the health care setting. The responses “worse than some races better than other races” and “only encountered people of the same race” were treated as missing because they did not indicate a strong sense of favorable or unfavorable treatment (Crawford et al., 2010; Hausmann et al., 2008; Parker et al., 2015).

The demographic variables included the following: age, (continuous), education, (high school education, some college or trade school, and college graduate or more), household income ($\leq 35k$, $>35k$, and missing), and marital status (married vs. non-married).

Data Analysis

Imputation.—A concern in social science research, especially with the use self-administered survey, is missing data. Using only the completed cases in the analyses when the data is not missing at random leads to biased results, including larger standard errors and wider confidence interval (Rubin, 1996). Multiple imputation is one method to deal with the bias that may result when estimating relationships when only the non-missing data. Multiple imputation is not a guess, but in fact is believed to create values constrained to the observed variability in the non-missing data and incorporates some variability based on variables correlated with the missing data and causes of missingness with the use of multiple imputed datasets (Buhi, Goodson, & Neilands, 2008; Rubin, 1996; White, Royston, & Wood, 2011).

Of the 779 respondents that completed both surveys, 419 were eligible for the analyses after accounting for the respondents that provided responses other than “worse than other races”, “the same”, “better” or those that did not respond to the two questions that assessed perceived “unfair treatment at work” and when “seeking healthcare”. Initial descriptive analyses revealed that 119 of the 419 respondents (28.4%) were missing on one or more of the variables used in the analyses. We evaluated the item non-response for each of the variables with respect to the other variables by comparing those missing on one or more variables ($n=119$) to those with complete non-missing data ($n= 300$) using independent t-test and chi-square analyses. The respondents with one or more missing variables were more likely to have reported poor treatment at work than the respondents with no missing data ($p < 0.05$). There was no statistically difference ($p < 0.05$) in the other variables of interest between those missing on one or more variables compared to those missing on none of the variables. Although we suspected that the data may have been missing at random (Buhi et al., 2008) we chose to impute data for the missing cases using an iterative imputation method that imputed multiple variables by using chained equations, a sequence of univariate

imputation methods with fully conditional specification of prediction equations (StataCorp, 2013; White et al., 2011). The imputed variables followed the distribution of the unimputed variables. In particular, age was continuous and was bounded by the original range of the non-missing data; smoking physical and emotional symptoms were imputed as binary, while income and education were imputed as ordinal categorical variables and emotional and physical reactions due to discrimination were imputed as categorical variable. For the final post-imputation analyses, we used 5 imputed datasets of 419 respondents in each datasets. All of the analyses in this study used STATA's multiple (mi) estimation commands, which adjusted the coefficients and standard errors for the variability between the 5 imputed datasets according to the combination rules proposed by Rubin (Rubin, 2004).

Data analyses.—Respondent characteristics were summarized and are presented in Table 1 for the total sample and smoking status using bivariate analyses, linear and logistic regression. The bivariate analyses, linear and logistic regressions, examined the relationship between the physical and emotional effects of discrimination (Table 2) and each of the respondent's characteristics separately. In Table 3, multivariable logistic regression analysis was used to examine the association between the effects of discrimination (physical and emotional) and smoking, controlling for the covariates. Four models were used to assess this relationship. Model 1 examined the bivariate association between the physical effects of discrimination on the odds of smoking. Model 2 examined the bivariate association between the emotional effects of discrimination on the odds of smoking. Model 3 examined the multivariate association between the physical *and* emotional effects of discrimination on the odds of smoking. Model 4 examined the multivariate association between the physical and emotional effects of discrimination on the odds of smoking, controlling for the domains of discrimination (workplace and health care), age, education, income, and marital status. P values less than 0.05 were considered significant. All of the analyses for the study were performed in STATA version 13 (StataCorp LP, College Station, TX).

RESULTS

The sample characteristics for the analytic sample are presented in Table 1. About 27% of the men were current smokers. Men in the sample reported a higher proportion of emotional effects of discrimination (31.6%), than physical effects of discrimination (26.9%). Moreover, study respondents reported a higher proportion of experiencing workplace discrimination (42%), than health care discrimination (25%). The mean age of men in the sample was 43. Over half of the men in the sample had some college education or higher (55.7%), and about 43.8% of the men had a household income below \$20,000. Over a third of the men were married (35.1%). Men who were current smokers reported more experiences with emotional and physical effects of discrimination, experiences with health care discrimination, had a household income below \$35,000, and not married. There were no significant differences with respect to workplace discrimination, age, and education.

Table 2 displays the sample characteristics for the analytic sample by the physical and emotional effects of discrimination. Men who reported having a physical response to discrimination had a higher proportion of being a current cigarette smoker, and reported a higher proportion of experiencing workplace and health care discrimination compared to

men who did not have a physical response to discrimination. No statistical differences ($p < 0.05$) existed in the proportion of the demographic variables by the physical effects of discrimination. Men who had an emotional response to discrimination had a higher proportion of being a current smoker, and reported higher proportion of workplace and health care discrimination compared to men who did not have an emotional effect. Married men reported a lower proportion of emotional responses to discrimination compared to non-married men.

Table 3 shows the results from the logistic regression depicting the association between smoking and the effects of discrimination (emotional and physical). In Model 1, men who had a physical response to discrimination had higher odds of being a current smoker (odds ratio (OR): 2.22, 95% confidence interval (CI): 1.58–3.12), compared to men who did not have a physical response to discrimination. Similarly, in Model 2 men who had an emotional response to discrimination had higher odds of being a current smoker (OR: 1.79, 95% CI: 1.19–2.71), compared to men who did not have an emotional response to discrimination. After adjusting for the physical and emotional effects of discrimination in Model 3, only physical responses to discrimination were significantly associated with higher odds of being a current smoker (OR: 1.95, 95% CI: 1.32, 2.88). Likewise, in the fully adjusted model, men with a physical response to discrimination had higher odds of being a current smoker (OR: 1.95, 95% CI: 1.15, 3.30) compared to men who did not have a physical response to discrimination.

DISCUSSION

The study examined the association between the physical *and* emotional effects of discrimination and current cigarette use among Black men using data from the Indiana Black Men's Health Study. Findings revealed that physical effects of discrimination were associated with current cigarette use, net of emotional effects of discrimination and other covariates of interest. The study findings indicate that physical responses to discrimination were most salient to the odds of cigarette smoking.

Interestingly, in the adjusted logistic regression models, males who had a physical response to racial discrimination had a two-fold increased odd to be a current smoker compared to those who did not have an adverse response to discrimination. Findings from the current study are similar to Purnell and colleagues' findings that demonstrated, in bivariate analyses, the positive association between the effects of discrimination and smoking (Purnell et al., 2012). Findings from this study suggest that Black males use smoking to manage the physical effects of unfair treatment. The significant findings were also consistent with the Stress Process Model, which suggests that individuals may engage in unhealthy coping behaviors to mediate social distress (Pearlin & Radabaugh, 1976; Pearlin & Schooler, 1978; Pearlin et al., 1981). The model proposes that in response to problematic social experiences individuals may use various behaviors to manage the emotional consequences of the problem (Pearlin & Radabaugh, 1976). Further, cigarette smoking may be used as a form of self-medication (Khantzian, 1997; Parrott, 1999). The self-medication hypothesis proposes that individuals engage in substance use to regulate physical and emotional pain in efforts to achieve emotional stability (Khantzian, 1997).

Emotion-focused coping strategies, like cigarette smoking, in response to discrimination can be useful in the short-term in deterring the immediate negative mood effects of discrimination (Pascoe & Smart Richman, 2009; Unger, 2015). However, in the long-term such usage can give way to long-term dependency and other adverse physical and psychological effects (Pascoe & Smart Richman, 2009; Unger, 2015). While the most effective coping style to mitigate the adverse effects of discrimination is unclear, active coping strategies like confrontation, positive reappraisal, and social support may be a protective factor against discrimination (Pascoe & Smart Richman, 2009). Further, previous studies have highlighted the utility of attribution of discrimination as a coping strategy for unfair treatment (Berjot & Gillet, 2011; Unger, 2015). Attributing discriminatory acts allows a stigmatized individual to attribute prejudiced attitudes to their perpetrator, thereby allowing the stigmatized individual to maintain their self-identity and not internalize the negative messages of the perpetrator (Berjot & Gillet, 2011). These coping strategies are important to consider when developing interventions that target those who have been inflicted by structural inequalities and discrimination.

Findings from the study highlight the need for empirical studies to examine coping strategies in response to discrimination. While smoking is commonly identified as a means to cope with stress, it invokes the opposite physiological response in the body by increasing blood pressure and heart rate immediately after smoking. Studies are needed to further elucidate the relationship between psychosocial stressors and cigarette smoking among Black men, as subsequent use of cigarette smoking can increase their risk for smoking-related health conditions like lung cancer and emphysema. Such studies should examine the how gendered social norms and masculine beliefs contribute to the use of cigarette smoking, and other unhealthy behaviors, to alleviate psychosocial stressors throughout the lifecourse of Black men (Bruce et al., 2015). To this end, the current study adds to the growing literature that suggests that the physical and emotional effects of discrimination are associated with the use of negative health behaviors, which, arguably, is used to cope with mistreatment (Paradies, 2006; Purnell et al., 2012; Williams, Neighbors, & Jackson, 2003).

Limitations

While the current study offers valuable insight on the association between the effects of discrimination and smoking, it is not without limitations. The first limitation concerns the generalizability of the findings. The current study used convenience and snowball sampling, a widely used method to recruit hard-to-reach populations (Sadler et al., 2010). Therefore, the findings might not be generalizable to all Black men and their experiences, and may not be completely representative of all-Black men in Indiana. Also, this was a self-reported survey, which could result in biased and social desirable responses. For instance, the men recruited in the sample could under-report their current cigarette use. However, the percent of Black males who were current smokers in the 2009 Indiana Behavioral Risk Factor Surveillance System (BRFSS) sample were very similar to the BMHS sample (31.8% vs. 30.1%, respectively). Further, reports of discrimination may be influenced by social desirability or recall bias. This could result in underreporting discrimination due to reappraising a discriminatory act as non-discriminatory in efforts to avoid invalidation by others (Harrell, 2000), or forgetting experiences of discrimination (Gee, Spencer, Chen, &

Takeuchi, 2007). Underreporting of discrimination would bias findings from the study towards the null (Gee et al., 2007; Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005). Interestingly, with respect to the experiences of unfair treatment at work, 20% of the black males in the 2009 Indiana BRFSS sample reported unfair treatment at work (compared to 42.1% in BMHS); while 4.5% reported worse treatment when seeking healthcare (compared to 25.4%) in the BMHS sample. The BMHS might identify important patterns of Black men's experiences that may be masked by national data. The last major limitation of the study is the missingness resulting from data collection methods. During data collection respondents were given the option to complete the second survey, some decided not to complete the second survey, which resulted in missingness. Future studies should consider exploring alternative collection methods to reach hard to reach populations like Black men.

Despite the studies limitations, there are several strengths of the study. The study offers a relatively large sample of Black men, a population that is often overlook and difficult to recruit in national studies. Further, the data was useful in addressing gaps in the discrimination literature by providing a more nuanced understanding on the effects of discrimination and modifiable health behaviors. To the authors' knowledge, no other studies have examined the association between the effects of discrimination and cigarette smoking among Black men. This study adds to the current literature by providing insight to the association between the responses to unfair treatment and cigarette smoking among Black men.

Conclusion

To the authors' knowledge, this is the first study to examine the effects of discrimination (physical and emotional) and cigarette use in an all-Black male sample. In the current study the physical effects of discrimination were most salient to cigarette smoking. Given that Black males are vulnerable to engage in cigarette smoking to cope with stressful events, more research is needed to further understand their smoking use patterns as a means to inform and develop coping interventions. Coping interventions must begin to focus beyond the traditional stressors such as unemployment, marital dissolution, and death/injury of family members. Such interventions should offer alternative coping strategies to employ when faced with discriminatory practices. Whether aimed at improving job-readiness skills or social-emotional coping in response to psychosocial stressors, interventions are needed to help Black men across the life course continuum understand the connection between psychosocial stressors like discrimination and cigarette smoking.

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References

- Bennett GG, Wolin KY, Robinson EL, Fowler S, & Edwards CL (2005). Perceived racial/ethnic harassment and tobacco use among african american young adults. *Am J Public Health*, 95(2), 238–240. doi: 10.2105/ajph.2004.037812 [PubMed: 15671457]
- Berjot S, & Gillet N (2011). Stress and coping with discrimination and stigmatization. *Frontiers in Psychology*, 2(33), 2. [PubMed: 21738514]
- Borrell LN, R. JD, Jr, Williams DR, Pletcher MJ, Houston TK, & Kiefe CI (2007). Self-reported racial discrimination and substance use in the coronary artery risk development in adults study. *Am J Epidemiol*, 166(9), 1068–79. doi: 10.1093/aje/kwm180 [PubMed: 17698506]
- Borrell LN, Diez Roux AV, Jacobs DR, Jr, Shea S, Jackson SA, Shrager S, & Blumenthal RS (2010). Perceived racial/ethnic discrimination, smoking and alcohol consumption in the multi-ethnic study of atherosclerosis (MESA). *Prev Med*, 51(3), 307–312. doi: 10.1016/j.ypmed.2010.05.017 [PubMed: 20609433]
- Bruce MA, Griffith DM, & Thorpe RJ, Jr. (2015). Social determinants of men's health disparities. *Family & Community Health*, 38(4), 281–283. doi:10.1097/FCH.0000000000000083 [PubMed: 26291188]
- Buhi ER, Goodson P, & Neilands TB (2008). Out of sight, not out of mind: Strategies for handling missing data. *Am J Health Behav*, 32(1), 83–92. doi: 10.5993/ajhb.32.1.8 [PubMed: 18021036]
- Chae DH, Takeuchi DT, Barbeau EM, Bennett GG, Lindsey JC, Stoddard AM, & Krieger N (2008). Alcohol disorders among asian americans: Associations with unfair treatment, racial/ethnic discrimination, and ethnic identification (the national latino and asian americans study, 2002–2003). *J Epidemiol Community Health*, 62(11), 973–9. doi: 10.1136/jech.2007.066811 [PubMed: 18854501]
- Chavez LJ, Ornelas IJ, Lyles CR, & Williams EC (2015). Racial/ethnic workplace discrimination: Association with tobacco and alcohol use. *Am J Prev Med*, 48(1), 42–49. doi: 10.1016/j.amepre.2014.08.013 [PubMed: 25441232]
- Crawford ND, Jones CP, & Richardson LC (2010). Understanding racial and ethnic disparities in colorectal cancer screening: Behavioral risk factor surveillance system, 2002 and 2004. *Ethnicity & Disease*, 20(4), 359. [PubMed: 21305822]
- Danaei G, Ding EL, Mozaffarian D, Taylor B, Rehm J, Murray CJ, & Ezzati M (2009). The preventable causes of death in the united states: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Med*, 6(4), e1000058. doi 10.1371/journal.pmed.1000058 [PubMed: 19399161]
- Fakunle D, Morton CM, & Peterson NA (2010). The importance of income in the link between tobacco outlet density and demographics at the tract level of analysis in new jersey. *J Ethn Subst Abuse*, 9(4), 249–259. doi: 10.1080/15332640.2010.522890 [PubMed: 21161808]
- Forman TA, Williams DR, Jackson JS, & Gardner C (1997). *Race, place, and discrimination*. () JAI Press.
- Gee GC, Spencer MS, Chen J, & Takeuchi D (2007). A nationwide study of discrimination and chronic health conditions among asian americans. *American Journal of Public Health*, 97(7), 1275–1282. [PubMed: 17538055]
- Griffith DM, & Thorpe RJ, Jr (2016). Men's physical health and health behaviors In Wong Y, & Wester S (Eds.), *APA handbook of men and masculinities*. APA handbooks in psychology series (pp. 709–730). Washington, DC: American Psychological Association. doi:10.1037/14594-032
- Guthrie BJ, Young AM, Williams DR, Boyd CJ, & Kintner EK (2002). African american girls' smoking habits and day-to-day experiences with racial discrimination. *Nurs Res*, 51(3), 183–190. doi: 10.1097/00006199-200205000-00007 [PubMed: 12063417]
- Haiman CA, Stram DO, Wilkens LR, Pike MC, Kolonel LN, Henderson BE, & Le Marchand L (2006). Ethnic and racial differences in the smoking-related risk of lung cancer. *N Engl J Med*, 354(4), 333–342. doi: 10.1056/NEJMoa033250 [PubMed: 16436765]
- Harrell SP (2000). A multidimensional conceptualization of racism-related stress: Implications for the well-being of people of color. *American Journal of Orthopsychiatry*, 70(1), 42–57. [PubMed: 10702849]

- Hausmann LR, Jeong K, Bost JA, & Ibrahim S (2008). Perceived discrimination in health care and health status in a racially diverse sample. *Med Care*, 46(9), 905–14. doi: 10.1097/MLR.0b013e3181792562 [PubMed: 18725844]
- Jamal A, Agaku IT, O'Connor E, King BA, Kenemer JB, & Neff L (2014). Current cigarette smoking among adults—United States, 2005–2013. *MMWR Morb Mortal Wkly Rep*, 63(47), 1108–1112. [PubMed: 25426653]
- Khantzian EJ (1997). The self-medication hypothesis of substance use disorders: A reconsideration and recent applications. *Harv Rev Psychiatry*, 4(5), 231–244. doi: 10.3109/10673229709030550 [PubMed: 9385000]
- Krieger N, Smith K, Naishadham D, Hartman C, & Barbeau EM (2005). Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. *Social Science & Medicine*, 61(7), 1576–1596. [PubMed: 16005789]
- Krieger N, Waterman PD, Hartman C, Bates LM, Stoddard AM, Quinn MM, ... Barbeau EM (2006). Social hazards on the job: Workplace abuse, sexual harassment, and racial discrimination—a study of black, latino, and white low-income women and men workers in the United States. *Int J Health Serv*, 36(1), 51–85. doi: 10.2190/3emb-ykrh-edj2-0h19 [PubMed: 16524165]
- Landrine H, Klonoff EA, Corral I, Fernandez S, & Roesch S (2006). Conceptualizing and measuring ethnic discrimination in health research. *J Behav Med*, 29(1), 79–94. doi: 10.1007/s10865-005-9029-0 [PubMed: 16470345]
- Laws MB, Whitman J, Bowser DM, & Krech L (2002). Tobacco availability and point of sale marketing in demographically contrasting districts of Massachusetts. *Tob Control*, 11(suppl 2), ii71–ii73. doi: 10.1136/tc.11.suppl_2.ii71 [PubMed: 12034986]
- Loomis BR, Kim AE, Goetz JL, & Juster HR (2013). Density of tobacco retailers and its association with sociodemographic characteristics of communities across New York. *Public Health*, 127(4), 333–338. doi: 10.1016/j.puhe.2013.01.013 [PubMed: 23515009]
- Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, ... Howard VJ (2015). Heart disease and stroke statistics—2015 update: A report from the American Heart Association. *Circulation*, 131, e29–e322. doi: 10.1161/CIR.0000000000000152 [PubMed: 25520374]
- Okechukwu CA, Krieger N, Chen J, Sorensen G, Li Y, & Barbeau EM (2010). The association of workplace hazards and smoking in a US multiethnic working-class population. *Public Health Rep*, 125(2), 225. [PubMed: 20297749]
- Paradies Y (2006). A systematic review of empirical research on self-reported racism and health. *Int J Epidemiol*, 35(4), 888–901. doi: 10.1093/Ije/Dyl056 [PubMed: 16585055]
- Parker L, Kinlock B, Chisolm D, Furr-Holden D, & Thorpe R (2016). Association between any major discrimination and current smoking among adult African American men. *Substance Use & Misuse*, 51(12), 1557–1564.
- Parker LJ, Hunte H, & Ohmit A (2015). Discrimination in health care correlates of health care discrimination among black males. *American Journal of Men's Health*, 9(1), 1557988315585164.
- Parrott AC (1999). Does cigarette smoking cause stress? *Am Psychol*, 54(10), 817. doi: 10.1037//0003-066x.54.10.817 [PubMed: 10540594]
- Pascoe EA, & Smart Richman L (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin*, 135(4), 531. [PubMed: 19586161]
- Pearlin LI, Menaghan EG, Lieberman MA, & Mullan JT (1981). The stress process. *J Health Soc Behav*, doi: 10.2307/2136676
- Pearlin LI, & Radabaugh CW (1976). Economic strains and the coping function of alcohol. *Am J Sociol*, 82(3), 652–663. doi: 10.1086/226357 [PubMed: 1036871]
- Pearlin LI, & Schooler C (1978). The structure of coping. *J Health Soc Behav*, doi: 10.2307/2136319
- Purnell JQ, Peppone LJ, Alcaraz K, McQueen A, Guido JJ, Carroll JK, ... Morrow GR (2012). Perceived discrimination, psychological distress, and current smoking status: Results from the behavioral risk factor surveillance system reactions to race module, 2004–2008. *Am J Public Health*, 102(5) doi: 10.2105/AJPH.2012.300694
- Rich J, & Roe M (2002). A poor man's plight: Uncovering the disparity in men's health.
- Rubin DB (1996). Multiple imputation after 18 years. *Journal of the American Statistical Association*, 91(434), 473–489.
- Rubin DB (2004). Multiple imputation for nonresponse in surveys John Wiley & Sons.

- Sadler GR, Lee H, Lim RS, & Fullerton J (2010). Recruitment of hard to reach population subgroups via adaptations of the snowball sampling strategy. *Nurs Health Sci*, 12(3), 369–374. doi: 10.1111/j.1442-2018.2010.00541.x [PubMed: 20727089]
- Schiller JS, Lucas JW, Ward BW, & Peregoy JA (2012). Summary health statistics for U.S. adults: National health interview survey, 2010. *Vital Health Stat* 10, (252), 1–207.
- Shariff-Marco S, Klassen AC, & Bowie JV (2010). Racial/ethnic differences in self-reported racism and its association with cancer-related health behaviors. *Am J Public Health*, 100(2), 364–374. doi: 10.2105/AJPH.2009.163899 [PubMed: 20019302]
- Siegel R, Naishadham D, & Jemal A (2012). Cancer statistics, 2012. *CA Cancer J Clin*, 62(1), 10–29. doi: 10.3322/caac.20138. [PubMed: 22237781]
- StataCorp LP (2013). Multiple-imputation reference manual College Station, TX: Stata Press <http://www.stata.com/bookstore/multiple-imputation-reference-manual>.
- Thorpe RJ, Jr, Bell CN, Kennedy-Hendricks A, Harvey J, Smolen JR, Bowie JV, & LaVeist TA (2015). Disentangling race and social context in understanding disparities in chronic conditions among men. *J Urban Health*, 92(1), 83–92. doi: 10.1007/s11524-014-9900-9 [PubMed: 25168686]
- Thorpe RJ, Wilson-Frederick SM, Bowie JV, Coa K, Clay OJ, LaVeist TA, & Whitfield KE (2013). Health behaviors and all-cause mortality in african american men. *Am J Mens Health*, 7(4 Suppl), 8S–18S. doi: 10.1177/1557988313487552 [PubMed: 23649171]
- Unger JB (2015). Preventing substance use and misuse among racial and ethnic minority adolescents: Why are we not addressing discrimination in prevention programs? *Substance use & Misuse*, 50(8–9), 952–955. [PubMed: 26361900]
- United States Department of Health Human Services. (2012). Centers for disease control and prevention (CDC) behavioral risk factor surveillance system survey questionnaire.
- United States Department of Health Human Services. (2014). The health consequences of smoking—50 years of progress. A Report of the Surgeon General,
- White IR, Royston P, & Wood AM (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Statistics in Medicine*, 30(4), 377–399. [PubMed: 21225900]
- Widome R, Brock B, Noble P, & Forster JL (2013). The relationship of neighborhood demographic characteristics to point-of-sale tobacco advertising and marketing. *Ethn Health*, 18(2), 136–151. doi: 10.1080/13557858.2012.701273 [PubMed: 22789035]
- Williams DR (2003). The health of men: Structured inequalities and opportunities. *Am J Public Health*, 93(5), 724–31. doi: 10.2105/ajph.93.5.724 [PubMed: 12721133]
- Williams DR, & Mohammed SA (2009). Discrimination and racial disparities in health: Evidence and needed research. *J Behav Med*, 32(1), 20–47. doi: 10.1007/s10865-008-9185-0 [PubMed: 19030981]
- Williams DR, Neighbors HW, & Jackson JS (2003). Racial/ethnic discrimination and health: Findings from community studies. *Am J Public Health*, 93(2), 200–8. doi: 10.2105/ajph.93.2.200 [PubMed: 12554570]

Table 1.

Indiana Black Men's Health Study Sample Characteristics (n= 419)

		Current Smoker	
		Yes	No
Smoking Status, %		73.5	26.5
Emotional Effects ^a , %			
Yes	31.6	41.8	27.9***
None	68.4	58.1	72.0
Physical Effects ^b , %			
Yes	26.9	40.3	22.0***
None	73.1	59.6	77.9
Domains of Discrimination ^c , %			
Workplace			
Yes	42.1	46.1	40.7
None	57.8	53.8	59.2
Health care			
Yes	25.4	33.6	22.4**
None	74.6	66.3	77.5
Age, mean (SE)	42.9 (1.01)	40.3	43.8
Education, %			
High School	44.2	58.9	38.9
Some college	33.2	30.2	34.3
College graduate	22.5	10.8	26.6
Household Income, %			
< \$35,000	43.8	69.5	48.3*
> \$35,000	19.1	15.1	41.9
Missing	37.1	15.3	9.7
Married, %			
Yes	35.1	25.2	38.6*
No	64.9	74.7	61.3

Notes: SE: standard error.

^aEffects include anger, sadness, and frustration^bEffects include headache, upset stomach, and pounding heart^cReports of experiencing discrimination in each respective domain.***
p<0.001,**
p<0.01,*
p<0.05

Table 2.

Sample Characteristics by Physical and Emotional Effects of Discrimination, Indiana Black Men's Health Study (n= 419)

Characteristics	Panel A			Panel B		
	Physical Effects of Discrimination ^a			Emotional Effects of Discrimination ^b		
	Yes (%)	No (%)	OR 95% CI	Yes (%)	No (%)	OR 95% CI
Current Smoker, %	39.7	21.6	2.39 (1.73, 3.00)	35.0	22.6	1.85 (1.33, 2.57)
Domains of Discrimination, %						
Workplace	56.2	37.0	2.19 (1.30, 3.69)	70.0	29.3	5.63 (3.72, 8.54)
Health care	37.6	20.9	2.28 (1.59, 3.27)	43.0	17.2	3.62 (2.37, 5.52)
Age, mean (SE)	43.2 (1.5)	42.8 (1.42)	1.00 (0.98, 1.02)	41.7 (1.2)	43.5 (1.6)	0.99 (0.97, 1.01)
Education, %						
High School	48.9	42.4	1.00	41.8	45.2	1.00
Some college	28.4	34.9	0.70 (0.43, 1.15)	33.8	32.9	1.11 (0.78, 1.59)
College graduate	22.7	22.3	0.88 (0.50, 1.55)	24.4	21.5	1.23 (0.80, 1.90)
Household Income, %						
< \$20,000	59.4	51.9	1.00	55.5	53.2	1.00
\$20,000–\$30,000	30.1	36.6	0.76 (0.45, 1.29)	30.9	36.7	0.72 (0.36, 1.44)
> \$35,000	10.5	11.5	0.69 (0.41, 1.17)	13.6	10.1	0.67 (0.44, 1.03)
Married, %	28.9	37.4	0.68 (0.38, 1.22)	26.7	39.0	0.57 (0.34, 0.94)

Note: OR: Odds ratio, CI: confidence interval.

^aP Physical Effects include headache, upset stomach, and pounding heart

^b Emotional Effects include anger, sadness, and frustration

Table 3.

Association Between Effects of Discrimination and Being A Current Smoker Among 419 Men in the Indiana Black Men's Health Study

	Model 1	Model 2	Model 3	Model 4
	Odds ratio (95% Confidence Interval)			
Physical Effects				
None (referent)	1.00		1.00	1.00
Yes	2.22 (1.58, 3.12)		1.95 (1.32, 2.88)	1.95 (1.15, 3.30)
Emotional Effects				
None (referent)		1.00	1.00	1.00
Yes		1.79 (1.19, 2.71)	1.29 (0.79, 2.12)	1.22 (0.60, 2.47)

Notes: Model 1 unadjusted, Model 2 unadjusted, Model 3 adjusted for physical and emotional effects, Model 4 adjusted for physical effects, emotional effects, health care discrimination, workplace discrimination, income, education, being married, and age.