



Journal of Health Disparities Research and Practice
Volume 5, Issue 4, Winter 2016, pp. 218-233
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Sociocultural Risk Factors for Elevated Perceived Stress among African American Smokers

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ABSTRACT

Introduction: African Americans experience unique stressors that may inhibit smoking cessation and enhance relapse rates. Few studies, however, have focused on risk factors for perceived stress among treatment seekers. Because African Americans are less likely to quit compared to the larger community, understanding factors associated with perceived stress among smokers has the potential to improve intervention outcomes. This study examined psychosocial and cultural correlates of stress in a sample of African American participants in a randomized controlled trial.

Methods: At baseline, participants reported demographic factors and completed assessments of smoking history, alcohol use, friend and household smoking, weight concerns, acculturation, depressive symptoms, and perceived stress ($N = 325$). Bivariate associations were examined, followed by multiple regression analyses to test independent relationships. The sample was comprised of mostly middle-aged males, with at least a high school education, who were single, and reported low household income. Participants were moderately nicotine dependent and smoked 18 cigarettes per day for 26 years.

Results: Perceived stress was inversely associated with age ($r = -.16, p = .004$), education ($r = -.11, p = .04$), household income ($r = -.11, p = .047$), and positively associated with being male ($r = .13, p = .02$). Stress perceptions were positively related to cigarettes per day ($r = .11, p = .049$), nicotine dependence ($r = .20, p = .001$), drinking frequency ($r = .15, p = .008$), drinking intensity ($r = .14, p = .02$), and inversely related to smoking duration ($r = -.12, p = .03$). We found positive associations between perceived stress and household smokers ($r = .18, p = .004$), and friends who smoke ($r = .15, p = .01$). Perceived stress was also positively associated with post-cessation weight concern ($r = .14, p = .01$), a traditional African American cultural orientation; $r = .12, p = .04$), and depressive symptoms ($r = .65, p < .001$). The full regression model accounted for 50% of the variance in perceived stress. After controlling for covariates, perceived stress was independently associated with younger age ($b = -.12, p = .03$), having other smokers in the household ($b = .21, p = .02$), and greater depressive symptoms ($b = .36, p < .001$).

Conclusion: These findings have important intervention implications. Many of the risk factors for distress among African American smokers are modifiable. Interventions

219 Sociocultural Risk Factors for Elevated Perceived Stress among African American Smokers

Webb Hooper et al.

should prioritize addressing depression, household smoking environment, and stress among younger smokers, in addition to managing other stress-enhancing concerns like alcohol use.

Keywords: perceived stress; depressive symptoms; acculturation; household smoking; smokers; African Americans; risk factors

INTRODUCTION

The prevalence of current cigarette smoking in the U.S. approximates 18%, with comparable rates between Whites and African Americans (CDC, 2014). However, notable health disparities exist, such that African Americans experience disproportionately greater rates of smoking-related morbidity and mortality from conditions such as lung cancer (Haiman et al., 2006; Siegel, Naishadham, & Jemal, 2012). There are multiple factors that contribute to racial/ethnic disparities in tobacco-related outcomes. African Americans are less likely to quit smoking compared to Whites (Royce, Hymowitz, Corbett, Hartwell, & Orlandi, 1993; Trinidad, Pérez-Stable, White, Emery, & Messer, 2011), which may extend the duration of exposure to cigarette toxicants and carcinogens and lead to poorer health. Achieving equity in cessation rates requires improving our understanding of factors that affect the ability to quit. Such factors include the negative effects of racial segregation on health (Williams & Collins, 2001), aggressive targeted advertising (Primack, Bost, Land, & Fine, 2007), greater point-of-sale marketing of tobacco products in African American neighborhoods compared to predominantly White areas (Lee, Henriksen, Rose, Moreland-Russell, & Ribisl, 2015), and a lower likelihood of healthcare providers advising African Americans to quit smoking compared to Whites (Cokkinides, Halpern, Barbeau, Ward, & Thun, 2008). Finally, addressing individual-level factors that are known to inhibit smoking cessation that may be greater among African Americans, such as stress (Hatch & Dohrenwend, 2007), is important to reduce disparities.

The experience of stress is robustly associated with smoking. Psychosocial stressors include any social or environmental exposures (e.g., financial strain, discrimination, relationship stress, etc.) that burden an individual from adapting, and in this instance, may inhibit smoking cessation (Slopen et al., 2012). A sizable literature supports the notion that perceptions of stress are positively related to smoking (Cohen & Lichtenstein, 1990; Gallo et al., 2014) and inversely related to cessation (Slopen et al., 2013) in the general population of smokers. Socioeconomic stressors (e.g., bankruptcy, high debt) are also positively associated with smoking (Kendzor et al., 2010; Siahpush, Yong, Borland, Reid, & Hammond, 2009). The effects of interventions in vulnerable populations may be increased with an understanding of factors related to stress, particularly among African Americans. Further, there are several sociodemographic and cultural risk factors for stress among smokers. For instance, previous research has identified socioeconomic disadvantage (Tsourtos & O'Dwyer, 2008), age (Hara et al., 2014), and sex (Dupont, Reynaud, & Aubin, 2012) as risk factors for elevated stress levels. Among smokers, nicotine dependence (Dupont et al., 2012), daily smoking intensity (Businelle et al., 2009), alcohol use (Adams et al., 2015; Kendzor et al., 2009; Moitra, Anderson, & Stein, 2013), and weight concerns (Webb & Carey, 2009) are all positively related to perceived stress. Depressive symptomatology has a well-established association with smoking and a lower likelihood of cessation (Catley et al., 2005; Weinberger, Mazure, Morlett, & McKee, 2013). Recent evidence suggests that symptoms of depression also are greater among primarily low-income African American smokers compared to White smokers (Hooper, Baker, & McNutt, 2014; Webb Hooper

Webb Hooper et al.

& Kolar, 2015). Berg et al. (2012) found high distress levels among African American smokers and a positive association between depressive symptoms and perceived stress. Ludman et al. (2002) found a significant relationship between perceived stress and smoking dependence among African Americans, but not White women. Thus, the experience of depressive symptoms is likely to affect perceived stress in this population.

Despite a limited evidence base, indicators suggest that the stress-smoking relationship is generalizable to African American smokers (Manning, Catley, Harris, Mayo, & Ahluwalia, 2005; Slopen et al., 2012; Webb & Carey, 2008). Webb Hooper and Kolar (2015) found elevated baseline distress (global perceived stress and depressive symptoms) in African American compared to White treatment-seeking smokers. African Americans also may experience elevated distress due to unique stressors that are positively associated with smoking, such as racism and discrimination (Bennett, Wolin, Robinson, Fowler, & Edwards, 2005; Guthrie, Young, Williams, Boyd, & Kintner, 2002) and neighborhood violence (Ewart & Suchday, 2002). However, lacking in the literature is an understanding of factors that correlate with perceptions of stress among African American smokers. Such information would be useful in developing culturally specific interventions designed for this population and/or in adapting traditional behavioral interventions to consider the needs of this group.

This study also explored two sociocultural factors that may be linked to perceptions of stress among African American smokers. Acculturation, or the dynamic process of adopting the cultural beliefs and practices of the majority group, is inversely associated with cigarette smoking among African Americans (Klonoff & Landrine, 1999). That is, African Americans who maintain a culturally traditional orientation are more likely to report current smoking. The present study will be the first to explore acculturation as a stress-invoking cultural process in African American smokers, particularly for individuals with a culturally traditional orientation. We also considered the possible role of social networks in perceived stress. While supportive social networks may buffer the distress (e.g., nicotine withdrawal, mood disturbance) often associated with cessation attempts (Cohen & Wills, 1985; Creswell, Cheng, & Levine, 2015; Mermelstein, Cohen, Lichtenstein, Baer, & Kamarck, 1986), a network that includes other smokers may have the opposite effect. Indeed, both self-stress and social network stress are related to greater distress in African American women (Woods-Giscombe, Lobel, Zimmer, Cene, & Corbie-Smith, 2015), and greater numbers of peer and household smokers reduce the odds of cessation (Castro, Heck, Forster, Widome, & Cubbin, 2015; Hitchman, Fong, Zanna, Thrasher, & Laux, 2014). Thus, we explored social networks as a possible risk factor for perceived stress.

The Current Study

Few studies have examined perceived stress and its risk factors in treatment-seeking African American smokers. Given the robust inverse associations between stress and smoking cessation, and the lower likelihood of quitting in this group, the identification of factors associated with high stress levels has implications for interventions. This study examined psychosocial and cultural correlates of perceived stress among African Americans enrolled in a smoking cessation randomized controlled trial. We sought to test bivariate and independent relationships between sex, income, cigarettes per day, nicotine dependence, weight concerns, household and peer smokers, alcohol use, and depressive symptoms and perceived stress. Given the lack of research examining cultural factors and stress among African American smokers, we also explored the possible relationship between acculturation and stress.

METHODS

Sample and Data Collection

This study was approved by the Institutional Review Board of the University of Miami. Data for this study were from the baseline assessment of a 2-arm randomized controlled trial examining the efficacy of culturally specific cognitive behavioral therapy (CS-CBT) for smoking cessation versus standard CBT (control) (N=325). The methodology of the full trial is described elsewhere (Webb Hooper et al., 2013). Briefly, the study tested the incremental effect of cultural specificity, by including components relevant to the African American community (e.g., history of race and smoking, targeted tobacco industry marketing, menthol cigarette use, cultural values, religion/spirituality, race-matched clinicians) within an evidence-based group cessation intervention. Participants were recruited from the community through neighborhood canvassing, partnerships with community clinics and organizations, word of mouth, flyers, and advertisements on public transportation. Eligible participants were between the ages of 18 – 65 years, smoked five or more cigarettes per day, spoke and read at least 6th grade English, and self-identified as African American. Respondents who reported contraindications for nicotine patch therapy, alcohol abuse or illicit drug use, or were receiving treatment for smoking cessation or substance abuse were excluded.

Measures

Demographics. Participants reported age, sex (1=male; 0=female), household income (continuous), education (0=less than high school; 1=high school or more), and race/ethnicity.

Smoking history and nicotine dependence. Participants reported the number of years smoked, daily smoking intensity (cigarettes per day), current household (continuous) and friends' smoking (1=some, most, or all versus 0=none). The Fagerström Test of Nicotine Dependence [FTND; (Heatherton, Kozlowski, Frecker, & Fagerström, 1991)] assessed dependence levels, which ranged from not dependent to highly dependent (range=1-10; alpha=.65).

Alcohol use. The frequency of alcohol use was assessed with the item, "During the past week, how many days per week did you drink any alcoholic beverages, on the average" (range=0-7)? Alcohol use intensity was assessed with the item, "On the days when you drank, about how many drinks did you drink on average?"

Weight concerns. Participant concerns about post-cessation weight gain were assessed with the item, "If you stopped smoking cigarettes today, how concerned would you be that you might start smoking again because of any weight gain?" Response categories included "not at all concerned," "somewhat concerned," or "very concerned."

Depressive symptoms. The Center for Epidemiologic Studies Depression scale (CES-D) is an established, 20-item measure of depressive symptomatology over the past week (Radloff, 1977). Scale items include "I was bothered by things that usually don't bother me," or "I felt sad." Responses were rated on a Likert scale, including 0=rarely or none of the time (less than 1 day), 1=some or a little of the time (1-2 days), 3=occasionally or a moderate amount of time (3-4 days), or 3=all of the time (5-7 days). Scores ranged from zero to 60, with higher scores indicating greater depressive symptoms. The internal consistency in the current sample was alpha=.87.

Acculturation. The African American Acculturation Scale-Revised (AAAS-R) is an established, 47-item instrument designed to assess identification with African American culture (Klonoff & Landrine, 1999). The AAAS-R includes eight subscales measuring topical areas such as religious beliefs and practices, preference for things African American, interracial attitudes, and family practices. Higher scores represent greater identification with facets of traditional African

Webb Hooper et al.

American culture, while lower scores indicate less identification (range=47-329). The internal consistency of the AAAS-R in the current sample was .92).

Perceived stress. The Perceived Stress Scale (PSS) is an established 10-item measure assessing perceptions of stressful circumstances and events over the past month (Cohen, Kamarck, & Mermelstein, 1983). Items include “In the last month, how often have you been upset because of something that happened unexpectedly?” or “In the last month, how often have you felt confident about your ability to handle your personal problems?” Responses ranged from 0=never, 1=almost never, 2=sometimes, 3=fairly often, and 4=very often. Items were summed (range =0-40), with higher scores indicating greater perceived stress. The PSS demonstrated strong internal consistency in the current sample ($\alpha=.72$).

Statistical Analyses. Descriptive statistics were conducted to estimate sample characteristics. Pearson’s correlations were used to determine bivariate relationships between demographic, psychosocial, cultural factors and perceived stress. We assessed multicollinearity using the tolerance statistic for each predictor variable. We conducted a hierarchical multiple regression to model the independent associations between perceived stress and variables demonstrating significant bivariate correlations. Intervention condition (culturally specific CBT or standard CBT) was entered in the first block, and the set of demographic, smoking history, alcohol use, cultural, and psychosocial factors were entered in block two. We evaluated the change in R^2 after controlling for condition, and the variance accounted for by the full model. We also focused on the significance of the individual predictors over and above all others. Alpha was set at $p<.05$. All data analyses were performed using SPSS version 22.

RESULTS

Table 1 details the sample characteristics. The majority of the sample completed at least high school and reported an annual household income of less than \$10,000. Participants were mostly single (not married), male, and middle aged. Over half of the sample was concerned about post-cessation weight gain (57.8%). With regard to tobacco smoking, participants averaged almost one pack of cigarettes per day for 26 years, and reported moderate nicotine dependence. The mean number of smokers living in the house (other than him/herself) was one, and most participants had at least some friends who were also current smokers. Regarding alcohol consumption, participants reported low to moderate frequency and intensity, averaging less than two drinks per week and two drinks per occasion, respectively. The AAAS-R indicated that participants, on average, reported moderately strong orientation to traditional African American culture. Finally, the overall sample reported high levels of depressive symptomatology and moderate levels of perceived stress.

Bivariate correlations examined the covariation between perceived stress and each of the demographic, smoking, alcohol, cultural, and psychosocial variables (Table 2). Of the demographic characteristics, perceived stress was inversely associated with age, education, household income, and positively associated with being male. Marital status was not related to perceived stress. Of the smoking history variables, perceived stress was positively related to cigarettes per day, nicotine dependence, and inversely related to smoking duration. Both alcohol use variables were positively related to perceived stress, including drinking frequency and intensity. We found positive associations between perceived stress and number of household smokers, and friends who smoke. Post-cessation weight concern also was positively associated with perceived stress, as were AAAS-R scores (i.e., a traditional African American cultural

223 Sociocultural Risk Factors for Elevated Perceived Stress among African American Smokers

Webb Hooper et al.

orientation, and depressive symptoms. Tolerance statistics found no evidence of multicollinearity.

Table 1
Sample Characteristics (N=325)

Variable	M (SD)	N (%)	Observed Range
Education			
Less than High School		58 (18%)	
High school or More		267 (82%)	
Marital Status			
Single, not married		209 (64.3%)	
Married/Partnered		116 (35.7%)	
Household Income			
Less than \$10,000		198 (61%)	
Greater than \$10,000		127 (39%)	
Sex			
Male		182 (56%)	
Female		143 (44%)	
Age	49 (9.3)		20-65
Smoking Behavior			
Cigarettes/day	18 (11.0)		5-60
Years Smoked	26 (12.2)		1-51
Nicotine Dependence	5 (2.4)		1-10
Weight			
Concerned		188 (57.8%)	
Not Concerned		137 (42.2%)	
Susceptibility to Smoke			
Number Smokers in Household	1 (2.7)		0-35
Friends Smoke			
Some/Most/All		218 (67%)	
None		107 (33%)	
Alcohol Use			
Frequency	1.5 (1.9)		0-7
Intensity	2 (2.9)		
Acculturation	213 (49)		48-329
Depressive Symptoms	21 (10.9)		0-50
Perceived Stress	19 (5.9)		4-36

Note: Nicotine dependence was assessed using the Fagerström Test of Nicotine Dependence. Categorical variables collapsed in Table for ease of presentation only, but not in statistical tests.

Table 2
Bivariate Correlations with Perceived Stress

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Perceived Stress	1														
2. Nicotine Dependence	.20**	1													
3. Age	-.16**	.00	1												
4. Education	-.11*	-.05	.07	1											
5. Household Income	-.11*	-.08	.07	.23**	1										
6. Household Smokers	.18**	.12*	-.09	-.16**	-.07	1									
7. Friends' Smoking	.15**	.10	-.11	-.19**	-.09	.10	1								
8. Alcohol Use Frequency	.15**	.05	-.01	-.06	-.04	-.01	.15**	1							
9. Alcohol Use Intensity	.14*	-.02	.01	-.06	-.02	.01	.13*	.72**	1						
10. Weight Concern	.14*	.10	.00	.03	-.07	-.02	.08	-.03	-.03	1					
11. Sex	.13*	.16**	-.16**	-.06	-.12*	.04	-.10	-.08	-.05	.20**	1				
12. Smoking Duration	-.12*	.14*	.61**	-.04	.07	-.03	.000	-.04	.01	.03	-.14**	1			
13. Cigarettes/Day	.11*	.64**	.09	.02	-.07	.04	.05	.08	-.02	.15**	.13*	.20**	1		
14. Depressive Symptoms	.65**	.30**	-.05	-.12*	-.15**	.11*	.16**	.12*	.09	.26**	.23**	-.08	.14*	1	
15. Acculturation	.12*	.13*	.05	-.04	-.03	.08	.08	.01	.01	.22**	.17**	.07	.07	.22**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

Webb Hooper et al.

Hierarchical multiple regression modeled independent correlates of perceptions of stress, after controlling for intervention condition (Table 3). Intervention condition was unrelated to perceived stress ($p = .88$). The model was significant [R^2 change = .50, F change ($df = 14, 241$) = 17.10, $p < .001$], and explained 50% of the variance in perceived stress. As can be seen in the table, the most robust correlate of perceived stress was depressive symptoms. After controlling for the other related factors, we found a significant, positive association between perceived stress and depressive symptoms. The number of household smokers also demonstrated an independent relationship with perceived stress, such that having more smokers in the home was related to greater perceptions of stress. Finally, age was independently associated with perceived stress, with stress levels decreasing with older age. The remaining variables were not statistically significant in the full model.

Table 3
Independent Correlates of Baseline Perceived Stress

Variable	b (SE)	p-value
Intervention Condition	-.77 (.57)	.18
Education	-.12 (.22)	.58
Household Income	.08 (.17)	.66
Sex	-1.04 (.62)	.10
Age	-.12 (.04)	.002
Smoking Behavior		
Cigarettes/day	.04 (.03)	.27
Years Smoked	.01 (.03)	.70
Nicotine Dependence	-.17 (.16)	.27
Weight Concerns	-.14 (.38)	.72
Susceptibility to Smoke		
Number Smokers in Household	.21 (.10)	.03
Friends Smoking	-.18 (.26)	.49
Alcohol Use		
Frequency	.31 (.22)	.16
Intensity	.03 (.16)	.84
Acculturation	.005 (.006)	.42
Depressive Symptoms	.36 (.03)	<.001

Note: Model $R^2 = .498$, $p < .001$

DISCUSSION

This study breaks new ground in our understanding of cessation-related challenges that may be experienced by African American smokers. Previous research has demonstrated the elevated distress (i.e., perceived stress and depressive symptoms) levels among African American smokers compared to Whites (Webb Hooper & Kolar, 2015), yet no studies have investigated factors that influence stress per se in this population. The most robust risk factor for perceived stress in this sample of mostly low-income African American smokers was depressive symptoms. A greater number of smokers living in the household and younger age also were associated with more perceived stress. These relationships remained significant even after controlling for covariates. Elevated distress among low-income African Americans may help explain why this

Webb Hooper et al.

population is less likely to quit smoking successfully. It is known that smokers report psychological stress as a reason for smoking (Hughes, 2009) or relapse after cessation, and the present study found that multiple demographic, smoking and alcohol-related, psychosocial, and cultural factors affected stress levels to some extent in this sample. It is imperative to understand factors associated with stress, as they may play a role in treatment outcomes.

Depressive symptoms maintained a significant relationship with perceived stress, above and beyond sociodemographic, smoking history, and alcohol use variables. The positive association between depressive symptoms and perceptions of stress affirms the importance of focusing on these two psychosocial concerns. The combination of high levels of stress and depression reduces the likelihood of smoking cessation (Webb Hooper & Kolar, 2015). This finding may identify smokers who are vulnerable to negative affect and may be smoking to self-medicate symptoms. This notion also is supported by the positive relationships found between perceived stress, daily smoking intensity, nicotine dependence, and alcohol use. However, because smoking is associated with an increase, rather than reduction, in stress (Hajek, Taylor, & McRobbie, 2010), the potential for a vicious cycle of nicotine dependence is apparent.

Social networks are known to influence smoking-related behavior (Hitchman et al., 2014). While supportive social networks can buffer the effects of stress (Cohen & Wills, 1985), networks that include other smokers may facilitate smoking or inhibit attempts to quit. Previous research found that living in a home with smokers (Ivory, Blakely, Richardson, Thomson, & Carter, 2015) and having friends who smoke (Hitchman et al., 2014) reduces the odds of cessation. It is possible that social support mediates the relationship between distress and smoking cessation, which should be investigated in future research. The current findings suggest that both household members and friends who smoke are related to perceived stress levels, although the quantity of friends who smoke was not significant in the multivariable model. Here, we found that living with other smokers in the home was independently related to greater perceived stress in African American smokers. Our results suggest that smokers who reside among smokers are at risk for greater feelings of having uncontrollable circumstances and overwhelming burden. Implementing home smoking restrictions might be a useful intervention in this context. Prior evidence suggests that African American smoking families are less likely to implement complete smoking bans compared to other racial/ethnic groups (Mills, White, Pierce, & Messer, 2011; Muilenburg et al., 2009). Research highlights the impact of home smoking bans (Muilenburg et al., 2009), and shows that even partial bans in African American households can lead to positive outcomes. Kegler et al. (2016) found that partial home smoking bans were positively related to future smoke-free homes. Implementing smoking restrictions at home, particularly among low-income smokers, is possible with minimal intervention (Kegler et al., 2015). Research is needed to determine whether home smoking bans might also reduce stress levels.

Relationships between demographic factors and perceived stress in this study were also found. Consistent with previous research (Businelle et al., 2010), socioeconomic indices (lower income and education) were associated with greater perceived stress. However, age was the sole factor to remain significantly related to stress in the full model. Specifically, younger smokers reported greater perceptions of stress. Little is known about psychosocial factors affecting young adult African American smokers. However, the rise in smoking rates as African Americans enter adulthood (Bares & Andrade, 2012) might be due to increased life stressors. The relationship between age and perceived stress in this population warrants additional research. To our knowledge, empirical investigations in this area are too few to offer firm conclusions.

Webb Hooper et al.

A culturally congruent approach to care would necessarily consider a range of factors that may be related to perceived stress among African American smokers. There may be unique stressors affecting African Americans that work to maintain smoking. The positive association between weight concerns and perceived stress was not maintained in the full model, yet may warrant further study. Despite the greater propensity to be obese among African American women in particular (Ogden, Carroll, Kit, & Flegal, 2012), few studies have paid attention to the role of weight concerns in perceived stress in this group. One previous study also found a positive relationship between expectations for smoking-related weight control and perceived stress among African American males and females (Webb & Carey, 2009). Issues related to weight, such as nutrition and physical activity, have known cultural components and may manifest themselves uniquely among African American smokers. Because weight concerns also can act as a barrier to smoking cessation, future research might test the mediating role of perceived stress. Evidence-based cessation interventions with a specific focus on distress and weight concerns are lacking, however, a randomized trial in this area is ongoing (Levine, Marcus, Kalarchian, & Cheng, 2013).

Finally, the present study was the first to explore the possibility that acculturation might contribute to overall perceptions of stress in this population. The significant correlation between acculturation and perceived stress suggests that a traditional African American cultural orientation (i.e., less acculturated) may increase the vulnerability to perceived stress. Few previous studies have considered acculturation in African American smokers, yet the accumulating evidence indicates that acculturation level distinguishes smokers from non-smokers (Klonoff & Landrine, 1996), is related to race-specific and general perceived stress (Fernander, Schumacher, & Nasim, 2008), and predicts smoking cessation (Hooper, Baker, de Ybarra, McNutt, & Ahluwalia, 2012). It is possible that culturally traditional African Americans may be seen as “more Black,” and may thus experience greater perceived stressors (e.g., stereotyping, discrimination, and racism) and a greater likelihood of smoking (Landrine & Klonoff, 1996). Because acculturation was not independently related to perceived stress in the multivariable model, it may represent a partial mediator of associations between variables that affect smoking risks.

The results of this analysis must be considered in light of its limitations. Study limitations included the cross-sectional design, which does not elucidate temporal associations or allow conclusions regarding causality. Although we did not seek a low-income sample specifically, the SES level of the sample and the study location may not be representative of African American smokers more generally. The generalizability of the findings also may be limited by the self-selection of participants who may differ from non-treatment seekers. Finally, self-reported data are always subject to recall and other biases; however, the consistency of the findings with previous research adds credibility to the present study.

CONCLUSION

In conclusion, efforts should be made to understand and address risk factors for perceived stress among African Americans, which likely affect smoking cessation and relapse. Modifiable factors, such as perceptions of distress should be assessed pre-intervention and incorporated into the treatment plan. Teaching and rehearsing skills to reduce perceived stress prior to quit attempts and over the course of treatment may be important for facilitating abstinence. Non-modifiable risk factors for stress (e.g., age, acculturation level) also can be discussed with smokers, and an asset-based, culturally appropriate approach may be helpful. Future research is warranted to test these possibilities. Future studies should also identify unique factors affecting younger African American smokers who want to quit smoking but have elevated perceived stress.

ACKNOWLEDGEMENTS

Many thanks to the National Cancer Institute of the National Institutes of Health under Award Number R01CA151614 for funding this research. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. We also thank the members of the Tobacco, Obesity, and Oncology Laboratory (TOOL) for their efforts in conducting the study. Finally, we sincerely thank the city of Miami and the participants in the study, as it would not be possible without their valuable contributions.

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