Ethnic variations in the relationship between multiple stress domains and use of several types of tobacco/nicotine products among a diverse sample of adults

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ABSTRACT

Introduction: Financial strain and discrimination are consistent predictors of negative health outcomes and maladaptive coping behaviors, including tobacco use. Although there is considerable information exploring stress and smoking, limited research has examined the relationship between patterns of stress domains and specific tobacco/nicotine product use. Even fewer studies have assessed ethnic variations in these relationships.
Methods: This study investigated the relationship between discrimination and financial strain and current tobacco/nicotine product use and explored the ethnic variation in these relationships among diverse sample of US adults ($N = 1068$). Separate logistic regression models assessed associations between stress domains and tobacco/nicotine product use, adjusting for covariates (e.g., age, gender, race/ethnicity, and household income). Due to statistically significant differences, the final set of models was stratified by race/ethnicity.
Results: Higher levels of discrimination were associated with higher odds of all three tobacco/nicotine product categories. Financial strain was positively associated with combustible tobacco and combined tobacco/nicotine product use. Financial strain was especially risky for Non-Hispanic Whites (AOR:1.191, 95%CI:1.083–1.309) and Blacks/African Americans (AOR:1.542, 95%CI:1.106–2.148), as compared to other groups, whereas discrimination was most detrimental for Asians/Pacific Islanders (AOR:3.827, 95%CI:1.832–7.997) and Hispanics/Latinas/Latinos (AOR:2.517, 95%CI:1.603–3.952).
Conclusions: Findings suggest discrimination and financial stressors are risk factors for use of multiple tobacco/nicotine products, highlighting the importance of prevention research that accounts for these stressors. Because ethnic groups may respond differently to stress/strain, prevention research needs to identify cultural values, beliefs, and coping strategies that can buffer the negative consequences of discrimination and financial stressors.

1. Background

Although cigarette smoking has declined in the United States (US), smoking prevalence remains high in specific subpopulations and continues to be the country's leading cause of preventable disease and death (Jamal et al., 2016; U.S. Department of Health and Human Services, 2014). Moreover, smoking prevalence varies by demographic subgroups, including race/ethnicity, economic status, and stress status (Chen & Unger, 1999; DeCicca, Kenkel, & Mathios, 2000; Jamal et al., 2016; Unger et al., 2001). Persons living below the poverty level have twice the prevalence rates of smoking compared to persons living above the poverty level (26.1% to 13.9% respectively), and persons with serious psychological distress report dramatically higher prevalence of smoking (40.6%) compared to persons experiencing lower levels of

stress (14.0%), with notable differences across ethnicity (Jamal et al., 2016). It is therefore important to identify ethnic differences in smoking risk factors and develop culturally tailored cessation approaches to augment current prevention efforts.

Psychosocial stressors, such as financial strain, discrimination, work stress, and adverse life events, are consistent predictors of substance use and negative health outcomes (Levi, 1974; Levine & Scotch, 2013; Thoits, 2010) as they strain an individual's internal resources and ability to effectively cope (Kamarck, 2012; Lazarus, 1966; Slopen et al., 2013). Chronic and acute stress elicit psychological and physiological responses that undermine self-regulation and overload coping strategies, increasing vulnerability for nicotine use (Conway, Vickers Jr, Ward, & Rahe, 1981; Landrine & Klonoff, 1996; Ng & Jeffery, 2003; Slopen et al., 2013). Because nicotine can reduce stressful feelings and

provide short-term positive reinforcement (Conway et al., 1981; Koob & Le Moal, 2002; Ng & Jeffery, 2003; Parrott, 1995; Slopen et al., 2013), smoking is often a form of self-medication.

Discriminatory stress resulting from ethnic, sexual orientation, or gender discrimination predicts tobacco product use particularly among women and ethnic minority groups (Chae et al., 2008; Guthrie, Young, Williams, Boyd, & Kintner, 2002; Unger, 2018). Financial strain is also associated with smoking and is commonly defined as economic hardships such as financial anxiety due to debt, being unable to afford needed items, poor housing conditions, long-term unemployment, and low income (Guillaumier et al., 2017; Kahn & Pearlin, 2006; Siahpush, Borland, & Scollo, 2003; Siahpush & Carlin, 2006; U.S. Department of Health and Human Services, 2014). Although studies have shown that a degree of financial strain can promote a reduction in smoking, severe financial strain increases quitting difficulty and increases relapse after quitting (Guillaumier et al., 2017; Kendzor et al., 2010; Pyle, Haddock, Poston, Bray, & Williams, 2007; Siahpush, Yong, Borland, Reid, & Hammond, 2009). Since severe financial strain is negatively associated with cessation, and smoking rates are highest among economically vulnerable populations and those with low socioeconomic status (SES) (Kendzor et al., 2010; U.S. Department of Health and Human Services, 2014), prevention efforts need to focus on disadvantaged groups.

Discriminatory and financial stressors are not equally distributed across populations and tend to vary by ethnicity, with disparities in tobacco product use especially pronounced in populations dealing with ethnic discrimination, such as African Americans (Guthrie et al., 2002; Landrine & Klonoff, 2000; Slopen et al., 2012), Asians/Pacific Islanders (Booker et al., 2007; Forster, Grigsby, Rogers, & Benjamin, 2018), Hispanics (Lorenzo-Blanco, Unger, Ritt-Olson, Soto, & Baezconde-Garbanati, 2011, 2012), and multiethnic populations (Booker, Gallaher, Unger, Ritt-Olson, & Johnson, 2004; Unger et al., 2001). Although there is a wealth of information exploring individual stressors and cigarette use, limited research has explored the effects of multiple domains of stress and the use of several types of tobacco/nicotine products. Typically, studies have not examined whether there are ethnic variations in the relationship between patterns of stress domains that include discrimination and financial strain and tobacco/nicotine use (Slopen et al., 2012; Slopen et al., 2013). To fill this gap in the literature, the present study examined differences in the relationship between discrimination and financial strain, and tobacco/nicotine product use across four groups.

Since the proliferation of alternative nicotine delivery systems, trends indicate that a large portion of the tobacco market is shifting from traditional, combustible tobacco products to alternative nicotine delivery systems such as smokeless tobacco and electronic nicotine products (Alcalá, von Ehrenstein, & Tomiyama, 2016; Bhattacharyya, 2012; Nguyen et al., 2015). Although e-cigarettes contain fewer toxicants, this move from traditional cigarette smoking to other tobacco products does not necessarily eliminate all negative health outcomes (National Academies of Sciences, E., and Medicine, 2018). With the increase in the prevalence and popularity of novel nicotine/tobacco products, it is important to explore possible ethnic variations in the relationship between discrimination and financial stress and combustible and electronic tobacco/nicotine product use.

The present study assessed the possible dose-response relationship between discrimination and financial strain, and current tobacco/nicotine product use. We hypothesized that financial stressors would be associated with higher odds of current H1) combustible tobacco product use; H2) electronic nicotine product use; and H3) any tobacco/nicotine product use. We also hypothesized that discrimination would be associated with higher odds of current H4) combustible tobacco product use; H5) electronic nicotine product use; and H6) any tobacco/nicotine product use. We also explored racial/ethnic differences in these associations; however, due to limited prior research in this area, we did not develop a priori hypotheses about the strength or direction of racial/ethnic differences.

2. Methods

Participants ($N = 1068$) were recruited through Mechanical Turk (MTurk), a website facilitated by Amazon that crowdsources participants, matching "workers" with available tasks from "requesters" (Buhrmester, Kwang, & Gosling, 2011; Sheehan, 2017). With demographics similar to the general US population and a successful track record with tobacco product use studies, MTurk allows researchers' access to a large population of willing and diverse research participants (Buhrmester et al., 2011; mTURK Tracker, 2017; Sheehan, 2017; Snider, Cummings, & Bickel, 2017; Unger, 2018). Data collected represent participants residing in 44 different states with the largest proportion of respondents living in California (11%), Florida (7.4%), New York (7.0%), and Texas (6.7%).

Inclusion criteria were US residency, being at least 18 years old, and having at least 90% of previous MTurk assignments completed. Consenting participants completed an electronic 30-item survey approved by the University of Southern California Institutional Review Board. The questionnaire took approximately 20 min to complete and included questions about demographics, SES and financial strain, tobacco/nicotine product use, social stress and discrimination, and social support and adverse childhood experiences. Participants received a $5 compensation upon completion, through the MTurk system.

3. Measures

3.1. Financial strain

The index measuring accumulated financial strain was comprised of items from the National Longitudinal Survey of Youth, Children and Adults, and items were prefaced with, "During the past 12 months" (Bureau of Labor Statistics, 2017). *Difficulty paying bills* was one item asking: "How much difficulty have you had paying bills?" Responses were dichotomized to "No difficulty" to "Some difficulty" = 0 or "Quite a bit of difficulty" to "Great difficulty" = 1. *Not making "ends meet"* each month was assessed by asking: "Thinking about the end of each month, did you generally end up with…" Responses were dichotomized to "More than enough" to "Just enough" = 0 or "Not enough" = 1. *Putting off buying needed items* was measured by asking: "How often do you put off buying something you need such as food, clothing, medical care, or housing because you don't have money?" Response options were dichotomized to "Never" and "Rarely" = 0 or "Occasionally" and "All the time" = 1. *Emergency fund* was measured by asking: "Have you set aside emergency or rainy-day funds that would cover your expenses for three months in case of sickness, job loss, economic downturn, or other emergencies?" Selection options were "Yes" = 1 and "No" = 0. *Consequences of financial delinquency* were comprised of: "Had an account sent to a collection agency," "Had something repossessed," "Filed for bankruptcy," and "Foreclosure of a property you owned or were renting." Response options were coded "No" to all four items = 0 or "Yes" to any of the four items = 1. *Needing a payday loan* was measured by asking: "Received a loan from a payday or other store-front lender." Selection options were "Yes" = 1 and "No" = 0. *Overdue bills* (> 60 days) were comprised of three items: "Utility bills," "Credit card bills," and "Other bills." Selection options were coded: "Not late to any bills" = 0 or "Late to at least one of the three bills" = 1. *Overdue loans* (> 60 days) were comprised of: "Mortgage or rent," "Car payment," and "Other kinds of loans." Selection options were coded: "Not late to any loans" = 0 or "Late to at least one loan" = 1. A cumulative financial strain index score was calculated by summing affirmative responses ranging from 0 to 8.

3.2. Discrimination

Discrimination related distress can occur as a result of discrimination based on many characteristics: gender, race, age, physical