Research Brief

Are Experiences of Discrimination Related to Poorer Dietary Intakes Among South Asians in the MASALA Study?

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ABSTRACT

Objective: To examine associations between self-reported discrimination and dietary intakes among South Asian (SA) people.

Methods: Data from the Mediators of Atherosclerosis in South Asians Living in America study were used to analyze the relationship between self-reported discrimination and dietary behaviors (n = 866). Self-reported discrimination was measured with the 9-item continuous Everyday Discrimination Scale. Diet was measured with a culturally tailored, validated, 163-item food frequency questionnaire for SA individuals. Dietary variables examined in these analyses included weekly consumption of fruits and vegetables and sweets. The researchers employed multiple logistic and linear regression models.

Results: Self-reported discrimination was unrelated to fruit and vegetable intake but was positively associated with consumption of sweets per week ($P = .001$).

Conclusions and Implications: Increased consumption of sweets may be a mechanism for SA individuals to cope with stressful experiences of discrimination. Further research examining discrimination and health behavior–related coping strategies among SA people is needed.

Key Words: discrimination, diet, coping, South Asian (*J Nutr Educ Behav*. 2017;■:1-5.)

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INTRODUCTION

Asian Americans are the fastest-growing racial group in the US, and South Asian (SA) people, those who emigrate from countries such as India, Pakistan, and Bangladesh, comprise a sizable portion of this expanding population.[1,2] A significant body of evidence demonstrated that SA individuals are exposed to chronic personal and social stressors such as family and relationship strain, work-related difficulties,[3] and interpersonal discrimination.[4,5] Therefore, the study of social stressors influencing the health of SA people is timely and warranted. Although the majority of studies examining the relationships between discrimination and health was conducted in the African American and Hispanic populations, a few studies reported associations between self-reported discrimination (SRD) and poorer physical and mental health outcomes among SA people.[6,7] However, the pathways in which SRD may influence the health of SA individuals remain unclear. Paradies[8] proposed several ways in which discrimination may influence health. First, SRD may directly trigger stressful physiological responses such as hypothalamus-pituitary-adrenal axis dysregulation, which can lead to poorer health outcomes. In addition, Paradies posited that SRD may lead to the adoption of maladaptive coping health-related behaviors that could result in poorer health outcomes. Examples of poorer health behaviors that may be used to manage discrimination-related stress were decreased physical activity, smoking, drinking, and unhealthy dietary behaviors.[8] For example, stress associated with low income status was associated with poorer dietary behaviors such as

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increased acute energy intake.[9] Therefore, it may be reasonable to speculate that discrimination-related stress may similarly trigger maladaptive coping behaviors through adopting a poor-quality diet.

Although findings were mixed as to whether discrimination influences health behaviors among ethnic minority groups other than SA people, a few studies found that among African American and Latino populations, discrimination-related stress may trigger the adoption of detrimental dietary behaviors such as binge eating and increased consumption of high-calorie foods.[10-15] Findings from these studies suggested that SRD was associated with poorer dietary health behaviors among other ethnic minority groups.[10-15] However, to the best of the authors' knowledge, there has been no study investigating how interpersonal discrimination may affect the dietary intakes of SA people. Therefore, the purpose of this study was to examine associations between SRD and diet, including (1) fruit and vegetable intake and (2) consumption of sweets.

METHODS

Sample and Setting

The main goal of the Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study was to determine sociocultural, behavioral, and biologic risk factors for subclinical atherosclerosis.[16] Adult SA participants were recruited from community-based sampling frames from the San Francisco Bay Area and greater Chicago areas between October, 2010 and March, 2013 and were provided a $25 incentive for participation in the MASALA study. Participants completed the MASALA survey via self-report and physiological measures were recoded. Baseline data from the MASALA study were used to analyze SRD and health-related behaviors among a middle-aged cohort of SA people. Specifically, the MASALA study measured intake and portion size of a wide range of individual fruit, vegetable, and sweet items, which were measurements used in the current study. Because there were participants with missing or unreliable food frequency (FFQ) and/or income data, the sample size for analyses was reduced from n = 906 to n = 866 for this study. Unreliable FFQ data were determined based on the assessment of Gadgi et al[17] of 1 individual having incomplete FFQ data and another 13 not meeting *a priori* criteria of daily caloric ranges for men (800–4200 kcal/24 h) and women (500–3500 kcal/24 h). The majority of study participants were Asian Indian (84%) and male (52.9%) and of generally high socioeconomic status. Institutional review boards at Northwestern University and at the University of California at San Francisco approved the MASALA study. Study methods are described in more detail elsewhere.[16]

Predictor Variable

The Everyday Discrimination Scale (EDS) measured SRD.[18] The EDS is a valid and reliable 9-item scale that captures the frequency of experiences of interpersonal discrimination, unfair treatment, and discrimination-related hassles. Sample questions on the EDS were: (1) *Have you ever been treated with less respect than other people?* and (2) *Have you received poorer services than others in restaurants or stores?*[18] The response option for every item ranged from *almost every day* to *never*; numeric values were assigned to each response item and items were totaled to reflect a continuous score. The scale ranged from 9 to 54, with higher values indicating more discrimination. Cronbach α was .87 for the EDS.

Outcome Variables

The researchers measured dietary intakes using a culturally appropriate, validated FFQ for the SA population.[19] In the study of Kelemen et al,[19] reliability coefficients ranged from 0.32 to 0.73 among average nutrient values reported on the FFQ among SA individuals. On the FFQ, participants were provided an extensive list of American and SA fruits, vegetables, and sweets and desserts, and asked to indicate how many of each were consumed per day, week, month, or year within the past year. Dietary scores reflected the consumption of summing 32 possible fruit (ie, apples, citrus, mangos, bananas) and vegetable (ie, cauliflower, broccoli, carrots, lettuce, sweet potatoes) response options. Separate scales were also created for fruit (12 possible items) and vegetable (20 possible items) consumption per week. Similarly, sweets consumption per week was measured by converting all frequency responses into weekly intake and by summing 14 possible response options (ie, doughnuts, cake, rice *kheer*). Because the 14 sweet items were composed of both traditionally American and traditionally SA sweets, a separate 7-item American sweets scale and 7-item SA sweets scale were created. All responses were converted into a weekly consumption scale. Serving size for each dietary response option was evaluated by asking participants to rate whether the serving size of the particular item consumed was below average, average, or above average in quantity. Participants were given estimates for what an average amount of each item would be. For example, the average portion size for many of the vegetables and fruits was indicated to be a half cup (or 125 mL). For sweets, an average portion size of candy was listed as 2 pieces, 1 piece of *chumchum* was considered an average portion, 1 half cup of rice *kheer* was listed as average, and so on. Dietary intakes scores were adjusted according to serving size by multiplying below average responses by 0.5, average responses by 1 (no adjustment), and above average responses by 1.5.[20]

Covariates and Statistical Analyses

Participants self-reported age, sex (female = 1; male = 0), income (≥$75,000/y = 1; <$75,000/y = 0), education (bachelor's degree or higher = 1; less than a bachelor's degree = 0), study site (San Francisco or Chicago), marital status (married or living with partner = 1; not married or not living with a partner = 0); and total years lived in the US for immigrants, which was total years of age for US-born participants. Based on previous literature indicating that cultural identity may be a source of stress for immigrants,[3,21] the traditional cultural beliefs[22] scale was included as a covariate in the models. The 7-item traditional cultural beliefs scale assessed how strongly SA people believed that cultural practices should be maintained in the US. The traditional cultural

beliefs measure reflected a continuous score range of 0–28, with lower scores reflecting stronger cultural beliefs and higher scores reflecting weaker cultural beliefs. The traditional cultural beliefs scale had a Cronbach α of .83 in the current study, which matched the previously reported reliability statistic of the entire MASALA cohort.[22] Bivariate correlations were examined and 6 multiple linear regression models were employed to investigate relationships between SRD and (1) fruit and vegetable consumption, (2) fruit consumption, (3) vegetable consumption, (4) sweets consumption, (5) American sweets consumption, and (6) SA sweets consumption. The researchers set significance at $\alpha < .05$. SPSS (version 24, IBM Corp., Armonk, NY) was used for all analyses.

RESULTS

Table 1 presents participant characteristics and dietary data. Slightly more men than women participated in the MASALA study and over 90% of participants had a bachelor's or advanced degree. Average discrimination scores were 15.06 ± 6.05 (mean ± SD). After all diet data were adjusted in accordance with average portion size, participants consumed a mean ± SD of 13.7 ± 8.5 servings of vegetables and 8.1 ± 6.5 servings of fruit per week. Overall sweet consumption per week was 1.1 ± 1.2 total sweets; the most sweets were of the American variety (1.6 ± 1.9; compared with SA, 0.6 ± 1.0).

Bivariate analyses revealed low correlations among variables, therefore multicollinearity was not an issue. To reduce heteroscedasticity, the researchers log-transformed positively skewed predictor and outcome variables for analyses. Multivariate analyses included all covariates (see Measures). Self-reported discrimination was not related to fruit and vegetable intake either combined or separately (all $P > .05$). Self-reported discrimination was independently associated with higher weekly consumption of sweets ($\beta = .170 \pm .043$; $P < .001$). Therefore, for every percentage point increase in discrimination, sweet intake increased by .017%. Additional multivariate analyses were conducted by separating American sweets and traditional SA sweets scales. Self-reported discrimination and American sweet consumption ($\beta = .188 \pm .056$; $P = .001$) as well as SRD and traditional SA sweet consumption ($\beta = .123 \pm .038$; $P = .001$) were independently significant. Bivariate analyses between SRD and all dietary intake outcomes were examined with the cases of missing income data and there were no significant changes in results (data not shown). Because of the significant findings between SRD and sweet intake, the researchers examined the relationship between SRD and a 6-item sugar-sweetened beverage (ie, cola, orange juice) intake scale, but findings were null ($P < .05$). Table 2 presents significant main finding analyses.

DISCUSSION

This study's objective was to evaluate whether SRD was associated with dietary behaviors including fruit and vegetable consumption and sweets consumption among SA individuals. Self-reported discrimination was not related to fruit and vegetable consumption. However, the researchers found support for SRD being linked to increased consumption of sweets.

As described in Paradies[8] and Cardel et al,[9] experiences of social stressors may lead to stress, trigger physiological stress responses, and lead primarily to the craving or desired intake of sweets.[23] Furthermore, sweets may be considered a comfort food used as a coping strategy for discrimination-related stress.[24] In other studies, stress was similarly related to unhealthy eating.[10-15,23-25] For example, a previous study suggested that Latino migrant and seasonal farmworkers consumed foods with little nutritional value and overate as coping mechanisms for stress arising from family situations, work environment, documentation status, and lack of resources.[25] Therefore various forms of stress, and in particular discrimination as experienced by SA people in the current study, may trigger maladaptive coping or physiological responses that lead to increased consumption of sweets or other less healthful foods.

Previous studies demonstrated the complex interplay among ethnic identity factors, language, socioeconomic status, and perceptions of discrimination.[18,26] Although the authors know of no studies specifically examining socioeconomic status as a modifier of SRD and dietary intakes among SA people, among the African American population, lower social status appears to have a detrimental effect of SRD on self-rated health.[26] However, links were reported between SRD and several self-reported health outcomes among a lower-income SA Sikh sample.[6] Because of associations between SRD and poorer dietary behaviors among higher-income individuals in the current MASALA study, it appears that SRD is detrimental to the health and health behaviors of SA people from diverse sociodemographic backgrounds.

In addition to studies demonstrating that sweets in general may be used to cope with stress,[9,24] prior research identified the consumption of specific, traditional festival foods as a coping mechanism for stressors among immigrants. Festival foods may be considered comfort foods for SA people because they are often traditionally eaten during holidays and special events and are typically tied to positive childhood memories, memories of home, and self-identity.[27] Importantly, festival foods are often calorie dense but lower in nutrient value,[27] which is consistent with the nature of many SA traditional sweets such as *gulab jamun* (syrup-soaked fried dough), *barfi* (a milk-based sweet), and *kheer* (rice pudding), as measured in this study. Therefore, the current study results suggest that SA people may find comfort in consuming SA traditional sweets in response to discrimination-related stressors.

These findings were limited by several factors. Because of participants' characteristics, these data were limited to experiences of SA participants who were roughly middle-aged and of higher income and educational status. However, the sociodemographic makeup of participants in the MASALA study was consistent with the majority of other SAs in this age group throughout the US.[2] Therefore, the current findings were representative of middle-aged SA people living in the US. The effect sizes for the main, significant analyses were relatively small, and warrant further investigation. A lack of control for chronic stress or other sources of stress such as health conditions is another limitation of the study. Because

Table 1. Characteristics of Mediators of Atherosclerosis in South Asians Living in America Study Participants (n = 906), 2010–2013

Variable	n (%)	Mean ± SD	Median (interquartile range)
Age, y		55.3 ± 9.4	
Female sex	420 (46.4%)		
Yearly household income ($) (n = 880)			
>74,999	637 (73.6)		
<75,000	229 (26.4)		
Bachelor's degree or higher	796 (87.9)		
Less than bachelor's degree	110 (12.1)		
Marital status			
Married	829 (91.5)		
Unmarried	77 (8.5)		
Years in US		26.5 ± 11.4	
Traditional cultural beliefs		13.98 ± 6.29	
Discrimination		15.06 ± 6.05	
Dietary intake/wk[a]			
Total fruit and vegetables		21.7 (12.1)	20.8 (14.0–28.7)
Total sweets		1.1 (1.2)	1.8 (1.3–2.4)

[a]n = 892 for dietary variables.

of the cross-sectional design of the study, causation and temporal ordering could not be determined. Although serving sizes such as half cups and 1 medium-sized apple were provided as average serving size examples for each food item, participants may have interpreted these amounts differently. Further research examining behavioral pathways linking discrimination and dietary behaviors is needed among the SA population and other ethnic minority groups to determine causation.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This study presented information regarding how SRD is related to eating behaviors among SA people. Based on the study's findings, SRD is positively associated with increased overall consumption of sweets. This may suggest that SA people use sweets as a coping mechanism for discrimination-related stress. This study is of public health interest because social stressors such as discrimination among the SA population are understudied and could be related to adverse lifestyle behaviors. Researchers should measure discrimination further in conjunction with other stressors that may hinder healthy eating behaviors. Clinicians may recognize poorer eating behaviors as a maladaptive coping response to discrimination-related stress and offer counseling or consider additional supports to cope with stressors in more healthful ways. Longitudinal studies examining discrimination and dietary behaviors may provide data to inform potential community- and individual-level stress reduction interventions further, which may include the development of healthy coping strategies and potentially psychological support for SA individuals who encounter discrimination. Subsequent studies may consider accounting for other stressors in their analyses and further testing coping style for modification effects on pathways between discrimination-related stress and poorer health behaviors. Furthermore, policy-level approaches may be considered to address discrimination experienced among SA people.

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Table 2. Multiple Regression Analyses for Relationships Between Discrimination and Intake of Sweets per Week

	Model 1			Model 2			Model 3		
	Total Sweets Intake			American Sweets Intake			South Asian Sweets Intake		
Outcome Variable	B	SE B	β	B	SE B	β	B	SE B	β
Age	−.002*	.001	−.098	−.004*	.001	−.131	.000	.001	.012
Female sex	−.031	.013	−.080	−.021	.017	−.042	−.042*	.012	−.122
Income ≥$75,000/y	−.007	.017	−.015	.002	.022	.004	−.016*	.015	−.039
Education bachelor's degree or higher	−.017	.021	−.028	−.004	.028	−.005	−.032*	.019	−.059
Married/living with partner	−.014	.025	−.020	−.029	.032	−.032	.011	.022	.017
Years in US	.001	.001	.029	.001	.001	.060	−.001	.001	−.040
Study site	.060*	.013	.154	.073*	.017	.143	.046	.012	.133
Traditional cultural beliefs	.000	.001	−.008	.003	.001	.067	−.004	.001	−.159
Discrimination	.170*	.043	.133	.188*	.056	.112	.123*	.038	.107
Multivariate coefficient	.05			.06			.08		
F for change in multivariate coefficient	$F_{9,865} = 5.406$**			$F_{9,865} = 5.718$**			$F_{9,865} = 8.258$*		

*$P < .05$; **$P < .001$.

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CONFLICT OF INTEREST

The authors have not stated any conflicts of interest.