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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 (SRD) and dietary intakes among South Asians (SA).

Methods—Data from the Mediators of Atherosclerosis in South Asians Living in America (MASALA) study were utilized to analyze the relationship between SRD and dietary behaviors (N = 866). SRD 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. Dietary variables examined in these analyses included: weekly consumption of fruits, vegetables (F&V), and sweets. Multiple logistic and linear regression models were employed.

Results—SRD was unrelated to F&V intake, but positively associated with sweets consumption per week (p = .001).

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Conclusions and Implications—Increased consumption of sweets may be a mechanism for SA to cope with stressful experiences of discrimination. Further research examining discrimination and health behavior-related coping strategies among SA are needed.

Keywords

discrimination; diet; coping; South Asian

Introduction

Asian Americans are the fastest growing racial group in the US and South Asians (SA), those who emigrate from countries such as India, Pakistan, and Bangladesh, comprise a sizable portion of this expanding population.[1, 2] There is a significant body of evidence demonstrating that SA 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 are timely and warranted. While the majority of studies examining the relationships between discrimination and health have been conducted in African Americans and Hispanics, a few studies have reported associations between self-reported discrimination (SRD) and poorer physical and mental health outcomes among SA.[6, 7] However, the pathways in which SRD may influence the health of SA remain unclear. Paradies[8] proposes several pathways in which discrimination may influence health. Firstly, SRD may directly trigger stressful physiological responses, such as hypothalamus pituitary adrenal (HPA) axis dysregulation, which can lead to poorer health outcomes. In addition, Paradies posits that SRD may lead to the adoption of maladaptive coping health-related behaviors which could result in poorer health outcomes. Examples of poorer health behaviors that may be utilized to manage discrimination-related stress are: decreased physical activity, smoking, drinking, and unhealthy dietary behaviors.[8] For example, stress associated with low income status is associated with poorer dietary behaviors such as increased acute energy intakes.[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 are mixed as to whether discrimination influences health behaviors among ethnic minority groups other than SA, a few studies have found that among African-Americans and Latinos 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 suggest that SRD is associated with poorer dietary health behaviors among other ethnic minority groups.[10-15] However, to the best of our knowledge, there has been no study investigating how interpersonal discrimination may impact the dietary intakes of SA. Therefore, the purpose of this study is to examine associations between SRD and diet including (1) fruit and vegetable intake and (2) sweets consumption.

Methods

Sample & 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 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 age cohort of SA. Specifically, the MASALA study measured intake and portion size of a wide range of individual fruit, vegetable, and sweet items, which were measurements utilized in the current study. Given that there were participants with missing or unreliable food frequency (FFQ) data 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 upon Gadgil, Anderson, Kandula, and Kanaya's (2015)[17] assessment of one individual having incomplete FFQ data and another 13 not meeting a priori criteria of daily caloric ranges for men (800–4200 kcal/24 hours) and women (500–3500 kcal/24 hours). The majority of study participants were Asian Indian (84%), male (52.9%) and of generally high socioeconomic status. Institutional review boards at XXX and the XXX have 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 frequency of experiences of interpersonal discrimination, unfair treatment, and discrimination-related hassles. Example questions on the EDS are: (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 ranges from 9 to 54 with higher values indicating more discrimination. The Cronbach's alpha was 0.87 for the EDS.

Outcome variables

Dietary intakes were measured using a culturally appropriate, and validated FFQ for SA.[19] In Kelemen et al.'s study[19], reliability coefficients ranged from 0.32 to 0.73 between the average nutrient values reported on the FFQ among SA. On the FFQ, participants were provided an extensive list of American and SA fruits, vegetables, and sweets/desserts and asked to indicate how many of each were consumed either per day, week, month, or year within the past year. Dietary scores reflect the consumption of summing 32 possible fruit (i.e. apples, citrus, mango, banana, etc.) and vegetable (i.e. cauliflower, broccoli, carrot, lettuce, sweet potato, etc.) response options. Separate scales were also created for fruit (12 possible items) and vegetable (20 possible items) consumption per week. Similarly, sweet consumption per week was measured by converting all frequency responses into weekly intake and by summing 14 possible response options (i.e. doughnuts, cake, rice kheer, etc.).

Given that the 14 sweet items were comprised of both traditionally American and traditionally SA sweets, separate 7-item American sweets scale and a 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 if the serving size of the particular item consumed was “below average,” “average,” or “above average” in quantity. Participants were given estimates on what an average amount of each item would be. For example, the average portion size for many of the vegetables and fruits was indicated as ½ cup (or 125 ml). For sweets, an average portion size of candy was listed as two pieces, one piece of chumchum was considered an average portion, ½ 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/year = 1; < $75,000/year = 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; unmarried 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 believed 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's alpha of .83 in the current study which matched the previously reported reliability statistic of the entire MASALA cohort[22]. Bivariate correlations were examined and six 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 sweet consumption, and (6) SA sweets consumption. We set significance criterion at $\alpha < 0.05$. We used SPSS version 24 for all analyses.

Results

Participant characteristics and dietary data are presented in Table 1. Slightly more men than women participated in the MASALA study and over 90% of participants had a bachelor's degree or an advanced degree. Average discrimination scores were 15.06. (6.05). After all diet data were adjusted in accordance with average portion size, participants consumed on average 13.7 (8.5) servings of vegetables and 8.1 (SD = 6.5) servings of fruit per week. Overall sweet consumption per week was 1.1 (SD = 1.2) total sweets with most sweets being of the American variety (M = 1.6, SD = 1.9 versus SA sweets M = .6, SD = 1.0).

Bivariate analyses revealed low correlations between variables, therefore multicollinearity was not an issue. To reduce heteroscedasticity, we log transformed positively skewed predictor and outcome variables for analyses. Multivariate analyses included all covariates

(see Measures). SRD was not related to F&V intakes either combined or separately (all p-values > .05). Self-reported discrimination was independently associated with higher weekly consumption of sweets (B = .170 (.043), p < .001). Therefore, for every percentage point increase in discrimination, sweet intake increases by .017%. Additional multivariate analyses were conducted by separating American sweets and traditional SA sweets scales. Self-reported discrimination and American sweet consumption (B = .188 (.056), p = .001) as well as SRD and traditional SA sweet consumption (B = .123 (.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). Given significant findings between SRD and sweet intake, we examined the relationship between SRD and a 6-item sugar sweetened beverage (i.e. cola, orange juice) intake scale but findings were null (p < .05). Table 2 presents significant main finding analyses.

Discussion

Our objective was to evaluate whether SRD was associated with dietary behaviors which included fruit and vegetable consumption and sweet consumption among SA. Self-reported discrimination was not related to fruit and vegetable consumption. However, we found support for SRD being linked with increased sweets consumption.

As described in Paradies[8] and Cardel[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] Further, sweets may be considered a “comfort food” that may be utilized as a coping strategy for discrimination-related stress.[24] In other studies, stress has been similarly related to unhealthy eating.[10-15, 23, 26, 27] For example, a previous study has suggested that Latino migrant and seasonal farmworkers consume junk foods and over-eat as coping mechanisms for stress arising from family situations, work environment, documentation status, and lack of resources.[27] Therefore various forms of stress, and in particular discrimination as experienced by SA in our study, may trigger maladaptive coping or physiological responses that lead to increased consumption of sweets or other less healthful foods.

Previous studies have demonstrated the complex interplay between ethnic identity factors, language, socioeconomic status and perceptions of discrimination.[18, 28] Although we know of no studies specifically examining socioeconomic status as a modifier of SRD and dietary intakes among SA, among African Americans lower social status appears to have a detrimental effect of SRD on self-rated health[28]. However, links between SRD and several self-reported health outcomes among a lower income SA Sikh sample have been reported[6]. Given associations between SRD and poorer dietary behaviors among higher income SA in the current MASALA study, it appears that SRD is detrimental to the health and health behaviors of SA from diverse sociodemographic backgrounds.

In addition to studies demonstrating that sweets in general may be utilized to cope with stress,[9, 24] prior research has identified the consumption of specific, traditional “festival foods” as a coping mechanism for stressors among immigrants.[30] Festival foods may be

considered “comfort foods” for SA as they are often traditionally eaten during holidays and special events and are typically tied to positive childhood memories, memories of home, and self-identity.[29] Importantly, festival foods are often calorie dense but lower in nutrient value[29] which is consistent with the nature of many SA traditional sweets such as gulab jamun (syrup soaked fried dough), barfi (milk based sweet), and kheer (rice pudding) as measured in this study. Therefore, our study results suggest that SA may find comfort in consuming SA traditional sweets in response to discrimination-related stressors.

Limitations

These findings are limited by several factors. Given participants characteristics, these data are limited to experiences of SA who are roughly middle-aged and of higher income and educational status. However, the socio-demographic makeup of participants in the MASALA study are consistent with the majority of other SAs in this age group throughout the US.[2] Therefore, our findings are representative of middle aged SA living in the US. The effect sizes for the main, significant analyses were relatively small, which warrant further investigation. **A lack of control for chronic stress or other sources of stress such as health conditions is a limitation of the study.** Due to the cross-sectional design of the study, one cannot determine causation and temporal ordering is an issue. Although serving sizes such as half-cups and “one medium size 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 are needed among SA and other ethnic minority groups to determine causation.

Implications for Research and Practice

This study presents information regarding how SRD is related to eating behaviors among SA. Based on our findings, SRD is positively associated with increased overall sweets consumption. This may suggest that SA utilize sweets as a coping mechanism for discrimination-related stress. This study is of public health interest as social stressors, such as discrimination among SA, are understudied and could be related to adverse lifestyle behaviors. Researchers should further measure discrimination 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 further inform potential community- and individual-level stress-reduction interventions which may include the development of healthy coping strategies and the potential of psychological support for SA 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. Further, policy-level approaches may be considered to address discrimination experienced among SA.

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References

1. Hoeffel EM, Rastogi S, Kim MO, Hasan S. The Asian Population. 2010; 2012
2. United States Census Bureau. Population groups summary file 1. 2010. Retrieved from http://2010.census.gov/news/press-kits/summary-file-1.html
3. Bhattacharya G, Schoppelrey SL. Preimmigration Beliefs of Life Success, Postimmigration Experiences, and Acculturative Stress: South Asian Immigrants in the United States. Journal of Immigrant Health. 2004; 6(2):83–92. [PubMed: 15014225]
4. Inman AG, Yeh CJ, Madan-Bahel A, Nath S. Bereavement and coping of south Asian families post 9/11. Journal of Multicultural Counseling and Development. 2007; 35(2):101–115. DOI: 10.1002/j.2161-1912.2007.tb00053.x
5. Tummala-Narra P, Inman AG, Ettigi SP. Asian Indians' responses to discrimination: A mixed-method examination of identity, coping, and self-esteem. Asian American Journal of Psychology. 2011; 2(3):205–218. DOI: 10.1037/a0025555
6. Nadimpalli SB, Cleland CM, Hutchinson MK, Islam N, Barnes LL, Van Devanter N. The association between discrimination and the health of Sikh Asian Indians. Health Psychology. 2016; 35(4):351–355. DOI: 10.1037/hea0000268 [PubMed: 27018726]
7. Nadimpalli SB, Hutchinson MK. An integrative review of relationships between discrimination and Asian American health. Journal of Nursing Scholarship. 2012; 44(2):127–135. DOI: 10.1111/j.1547-5069.2012.01448.x [PubMed: 22551064]
8. Paradies YC. Defining, conceptualizing and characterizing racism in health research. Critical Public Health. 2006; 16(2):143–157. DOI: 10.1080/09581590600828881
9. Cardel M, Johnson S, Beck J, et al. The effects of experimentally manipulated social status on acute eating behavior: A randomized, crossover pilot study. Physiology & Behavior. 2016; 162:93–101. DOI: 10.1016/j.physbeh.2016.04.024 [PubMed: 27094920]
10. Corral I, Landrine H. Racial discrimination and health-promoting vs damaging behaviors among African-American adults. Journal of Health Psychology. 2012; 17(8):1176–1182. DOI: 10.1177/1359105311435429 [PubMed: 22313668]
11. Shariff-Marco S, Klassen AC, Bowie JV. Racial/ethnic differences in self-reported racism and its association with cancer-related health behaviors. American Journal of Public Health. 2010; 100(2):364–374. DOI: 10.2105/ajph.2009.163899 [PubMed: 20019302]
12. Johnson P, Risica P, Gans K, Kirtania U, Kumanyika S. Association of perceived racial discrimination with eating behaviors and obesity among participants of the SisterTalk study. Journal of National Black Nurses' Association: JNBNA. 2012; 23(1):34–40. [Accessed September 28, 2016] https://www.ncbi.nlm.nih.gov/pubmed/23061168. [PubMed: 23061168]
13. Hayman LW, McIntyre RB, Abbey A. The bad taste of social ostracism: The effects of exclusion on the eating behaviors of African-American women. Psychology & Health. 2014; 30(5):518–533. DOI: 10.1080/08870446.2014.983923 [PubMed: 25403251]
14. Durso LE, Latner JD, Hayashi K. Perceived discrimination is associated with binge eating in a community sample of non-overweight, overweight, and obese adults. Obesity Facts. 2012; 5(6):869–880. DOI: 10.1159/000345931 [PubMed: 23258192]
15. Flowers KC, Levesque MJ, Fischer S. The Relationship Between Maladaptive Eating Behaviors and Racial Identity Among African American Women in College. Journal of Black Psychology. 2011; 38(3):290–312. DOI: 10.1177/0095798411416459
16. Kanaya AM, Kandula N, Herrington D, Budoff MJ, Hulley S, Vittinghoff E, Liu K. Clin Cardiol. Mediators of Atherosclerosis in South Asians Living in America (MASALA) study: objectives, methods, and cohort description. 2013; 36(12):713–20. DOI: 10.1002/clc.22219.Epub2013Nov5

17. Gadgil MD, Anderson CA, Kandula NR, Kanaya AM. Dietary Patterns Are Associated with Metabolic Risk Factors in South Asians Living in the United States. Journal of Nutrition. 2015; 145(6):1211–1217. DOI: 10.3945/jn.114.207753 [PubMed: 25904730]

18. Williams DR, Yu Y, Jackson JS, Anderson NB. Racial Differences in Physical and Mental Health: Socio-economic Status, Stress and Discrimination. Journal of Health Psychology. 1997; 2(3):335–351. DOI: 10.1177/135910539700200305 [PubMed: 22013026]

19. Kelemen LE, Anand SS, Vuksan V, et al. Development and evaluation of cultural food frequency questionnaires for South Asians, Chinese, and Europeans in North America. Journal of the American Dietetic Association. 2003; 103(9):1178–1184. DOI: 10.1016/s0002-8223(03)00985-4 [PubMed: 12963948]

20. Talegawkar SA, Kandula NR, Gadgil MD, Desai D, Kanaya AM. Dietary intakes among South Asian adults differ by length of residence in the USA. Public Health Nutrition. 2015; 19(02):348–355. DOI: 10.1017/s1368980015001512 [PubMed: 25990446]

21. Shariff A. Ethnic Identity and Parenting Stress in South Asian Families: Implications for Culturally Sensitive Counselling. 2009; 43(1):35–46.

22. Kanaya AM, Ewing SK, Vittinghoff E, Herrington D, Tegeler C, Mills C, Kandula NR. Acculturation and subclinical atherosclerosis among U.S. South Asians: Findings from the MASALA study. Journal of Clinical and Experimental Research in Cardiology. 2014; 1:1–9.

23. Adam TC, Epel ES. Stress, eating and the reward system. Physiology & Behavior. 2007; 91(4): 449–458. DOI: 10.1016/j.physbeh.2007.04.011 [PubMed: 17543357]

24. Dallman MF, Pecoraro N, Akana SF, et al. Chronic stress and obesity: A new view of “comfort food ”. Proceedings of the National Academy of Sciences. 2003; 100(20):11696–11701. DOI: 10.1073/pnas.1934666100

25. Sulkowski ML, Dempsey J, Dempsey AG. Corrigendum to “effects of stress and coping on binge eating in female college students” [Eat. Behav. 12 (2011) 188–191]. Eating Behaviors. 2013; 14(3):410.doi: 10.1016/j.eatbeh.2013.03.001

26. Wichianson JR, Bughi SA, Unger JB, Spruijt-Metz D, Nguyen-Rodriguez ST. Perceived stress, coping and night-eating in college students. Stress and Health. 2009; 25(3):235–240. DOI: 10.1002/smi.1242

27. Winkelman S, Chaney E, Bethel J. Stress, Depression and Coping among Latino Migrant and Seasonal Farmworkers. International Journal of Environmental Research and Public Health. 2013; 10(5):1815–1830. DOI: 10.3390/ijerph10051815 [PubMed: 23644829]

28. Ren XS, Amick BC, Williams DR. Racial/ethnic disparities in health: the interplay between discrimination and socioeconomic status. Ethn Dis. 1999; 92:151–165.

29. Azar KMJ, Chen E, Holland AT, Palaniappan LP. Festival foods in the immigrant diet. Journal of Immigrant and Minority Health. 2012; 15(5):953–960. DOI: 10.1007/s10903-012-9705-4

Table 1
Characteristics of the MASALA study participants (N=906), 2010-2013

Variable	n (%)	M ± SD	Median (IQR)
Age		55.3 ± 9.4	
Sex			
Women	420 (46.4%)		
Yearly household income *			
>$74,999	637 (73.6)		
<$75,000	229 (26.4)		
Bachelor's or higher	796 (87.9)		
Less than bachelor's	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/week **			
Total Fruit & vegetables		21.7 (12.1)	20.8 (14.0-28.7)
Total Sweets		1.1 (1.2)	1.8 (1.3-2.4)

Note.

* *N = 880* for income variable;

** *N* = 892 for dietary variables

Table 2

Multiple Regression Analyses for Relationships Between Discrimination and Intake of Sweets/Week

	Model 1			Model 2			Model 3		
Outcome	**Total Sweet Intake**			**American Sweet Intake**			**South Asian Sweet Intake**		
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/year	-.007	.017	-.015	.002	.022	.004	**-.016** *	.015	-.039
Education bachelors 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**
R^2	.05			.06			.08		
F for change in R^2	**F (9, 865)=5.406** **			**F (9, 865)=5.718** **			**F (9, 865)=8.258** *		

* $p < .05$.;

** $p < .001$

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