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Perceived stress and dietary choices: The moderating role of stress management

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ABSTRACT

Many college students exhibit unhealthy eating behaviors, consuming large quantities of high-fat foods and few fruits and vegetables. Perceived stress has been linked to daily dietary choices among college students; however, this work has been conducted among predominantly white, female populations. The role of perceived stress management in moderating this relationship is unclear. This study investigated the relationship between perceived stress and dietary choices among a diverse sample of male and female college freshmen and assessed whether perceived ability to manage stress moderated this relationship. 613 students from a large, public university completed an online survey which assessed past week consumption of various foods and beverages (e.g. soda, fast food, fruits, vegetables), as well as perceived stress and ability to manage stress. Hierarchical linear regression examined the association between perceived stress and past week dietary choices, and the moderating effect of perceived ability to manage stress, controlling for demographic variables. Perceived stress was positively associated with past week soda, coffee, energy drink, salty snack, frozen food, and fast food consumption ($p < 0.05$). Perceived stress management moderated the relationship between stress and sweet snack consumption. Individuals who reported low ability to manage stress consumed greater amounts. Findings indicate greater stress is associated with poor dietary choices among college freshmen. The relationship between stress and sweet snack consumption was exacerbated among those who reported low ability to manage stress. It may be important for college nutrition education programs to focus on the relationship between stress and diet and promote effective stress management techniques.

1. Introduction

Entering college can be a major life transition, with significant lifestyle changes, including those related to diet. Many college students exhibit unhealthy eating behaviors, such as skipping meals and consuming large quantities of carbonated beverages (Huang, Song, Schemmel, & Hoerr, 1994), fast food (Driskell, Kim, & Goebel, 2005), and high-fat foods (Dinger, 1999), while consuming few fruits and vegetables (Driskell et al., 2005). These behaviors are problematic as the percentage of college students classified as overweight or obese increased from 29% in 2000 to 32.5% in 2009 (American College Health Association National College Health Assessment II, 2010). Mild or moderate overweight during young adulthood is associated with increased incidence of obesity in adulthood, and research suggests those who are obese or become obese during young adulthood are more likely to remain obese as they age (McTigue, Garrett, & Popkin, 2002). This increases risk for adverse health outcomes, including high cholesterol, hypertension (Freedman, Dietz, Srinivasan, & Berenson, 1999) and type 2 diabetes (Pinhas-Hamiel & Zeitler, 1996).

One modifiable cause of obesity is that of excess calories consumed relative to those expended, which can be partially addressed by eating a healthy diet. However, dietary behaviors can be impacted by various factors. Perceived stress, which occurs when an individual appraises the environment as taxing or exceeding personal resources (Lazarus & Folkman, 1984), may contribute to onset and maintenance of unhealthy eating patterns in college students. For instance, greater perceived stress has been linked to greater desire (Tuschen-Caffier & Vögele, 1999) and likelihood (Freeman & Gil, 2004) to binge-eat, and more calories consumed during binge-eating episodes (Crowther, Snaftner, Bonifazi, & Shepherd, 2001). These findings are disconcerting since research indicates that 75–80% of college students perceive themselves as "moderately stressed," and 10–12% as "highly stressed," (Abouserie, 1994; Pierceall & Keim, 2007) .

Stress has been linked to non-disordered eating behaviors, such as food preference, among college students (Kandiah, Yake, Jones, & Meyer, 2006; Oliver & Wardle, 1999). Higher stress has been associated with greater preference for sweet foods (e.g. candy, ice cream), mixed

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dishes (e.g. pizza, fast food; Kandiah et al., 2006), increased consumption of snack-type foods, and decreased consumption of meal-type foods such as fruits, vegetables, meat, and fish (Oliver & Wardle, 1999). Most research examining the relationship between perceived stress and eating behaviors among college students has been conducted among predominantly white females (Habhab, Sheldon, & Loeb, 2009; Kandiah et al., 2006). Moreover, research has focused on this relationship among restrained (those who consciously restrict food intake in order to lose or maintain weight) or emotional eaters (those who eat in response to negative affect; Habhab et al., 2009), both of which have been linked to disordered eating behaviors (Delinsky & Wilson, 2008).

Examining the stress-food preferences relationship within a diverse college student population is important. Perceived stress may influence daily dietary practices, not only due to its association with etiology, maintenance, and exacerbation of eating disorders, but also because they alter long-term dietary patterns further from recommended nutrition guidelines (Cartwright et al., 2003). Greater perceived stress may have adverse impacts on college students' food choices by decreasing consumption of healthy foods (i.e. nutrient-dense foods such as fruits and vegetables) and increasing consumption of unhealthy foods (i.e. calorie-dense, low-nutrient foods such as sugar-sweetened beverages, fast food, etc.; Harris, Pomeranz, Lobstein, & Brownell, 2009). Therefore, the primary aim of this study was to investigate whether college students' perceived stress was associated with everyday dietary choices.

Individuals experiencing stress often perceive they have insufficient resources to handle demands of their environment (Lazarus & Folkman, 1984). Thus, the relationship between perceived stress and dietary choices may depend upon perceived ability to effectively manage that stress (hereafter referred to as perceived management). Previous work has examined the effect of specific coping styles (both adaptive and maladaptive) on the relationship between stress and dietary choices and behaviors (Oliver, Wardle, & Gibson, 2000; Wallis & Hetherington, 2004). Few studies have examined how perceived management may exacerbate or buffer this relationship. Therefore, a secondary aim was to determine whether perceived management moderated the relationship between perceived stress and dietary choices.

Greater perceived stress was hypothesized to be associated with increased consumption of unhealthy foods and decreased consumption of healthy foods. It was further hypothesized that perceived management would moderate the relationship between perceived stress and food consumption, where lower perceived management would exacerbate the impact of perceived stress on consumption of healthy and unhealthy foods.

2. Methods

2.1. Participants and design

Data are from an online survey administered at the end of the 2010–2011 academic year. Participants were a sample of incoming freshman in 2010 at a large, southwestern university in the United States. Students were eligible if they were enrolled in AlcoholEdu, an online alcohol prevention program. Of the incoming freshman class, 5751 students were eligible for participation. Students completed the survey between April and June 2011. The first page of the survey contained an informed consent document. Consent was indicated by clicking agreement. All study protocols were approved by the university's Institutional Review Board.

A total of 844 students agreed to participate, a response rate of approximately 15%. Participants who did not classify themselves as a freshman (n = 100) or who identified themselves as transgender (since gender was a covariate; n = 8) were excluded from the study, leaving a sample of 736 students (M_{age} = 18.9 years; 58.8% female). Participants were 51% White, 21.8% Asian American/Pacific Islander, 19.8% Hispanic, 2.2% Black, and 5.2% Other. The sample is fairly representative of the university's undergraduate population in 2010, which was 47.6% White, 17.4% Asian/Pacific Islander, 23.1% Hispanic, 5.1% Black, and 6.8% Other.

2.2. Measures

2.2.1. Dietary choices

Food and beverage consumption (i.e. soda, diet soda, coffee, energy drinks, pre-packaged salty snack foods, pre-packaged sweet snack foods, frozen meals, and fast food) over the previous week was assessed with the question, "during the past seven days, how many times did you eat/drink the following things?" Responses were rated on a 7-point scale from "never" to "4 or more times a day". These measures were adapted from previous work conducted in a similar population (Boynton Health Service : University of Minnesota, 2009).

Fruit and vegetable (FV) consumption was assessed by asking how many servings of each item were usually consumed per day. Response options included "0 servings", "1–2 servings", "3–4 servings", and "5 or more servings" per day (ACHA-NCHA Data, 2010).

Response options for food and beverage items were used as continuous variables, consistent with previous research among college populations (Laska, Larson, Neumark-Sztainer, & Story, 2010).

2.2.2. Stress

Perceived stress was measured via a single item, "On a scale from 1 (not stressed at all) to 10 (very stressed), how would you rate your average level of stress in the past 30 days?". This item was used as a continuous variable, consistent with previous work (Nelson, Lust, Story, & Ehlinger, 2008).

2.2.3. Stress management

Participants' perceived management was assessed with a single question, adapted from research in a similar population (Boynton Health Services, 2009), "On a scale from 1 (completely ineffective) to 10 (completely effective), how would you rate your ability to manage stress in the past 30 days?". This item was used as a continuous variable.

2.2.4. Covariates

Previous research indicates that food choice differs by gender (Wardle et al., 2004), race/ethnicity (DeBate, Topping, & Sargent, 2001), and BMI (Brunt, Rhee, & Zhong, 2008). Thus, these variables were included as covariates in analyses. Participants self-reported gender (female = 1, male = 2), and race/ethnicity (i.e. White, Hispanic, Black, Asian/Pacific Islander, and other). For analyses, race/ethnicity was coded as White (0) or non-White (1). BMI was calculated from self-reported weight and height (M = 23.0). While mean BMI was normal, approximately 30% of students had a BMI within a non-normal range – either underweight (5.5%) or overweight/obese (23.4%), demonstrating a diverse sample.

2.3. Data analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS, version 23). Multiple hierarchical linear regressions determined the relationship between stress and dietary choices, controlling for gender, BMI, and race. Models were run with perceived management as a moderator. Of the 736 students eligible for this study, 16.7% were missing data for the predictor variable, perceived stress, ending in a final sample of 613 participants. No significant differences in age, gender, race, and BMI were found between those included and excluded for analysis (See Table 1). Due to missing outcome data ranging from 14.8% (soda) to 15.1% (fruit), final models vary in sample size.