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# Multiple health behaviors: Patterns and correlates of diet and exercise in a Hispanic college sample

Dixie Hu [a], Thom Taylor [b], Julie Blow [b], Theodore V. Cooper [b,*]

[a] Department of Psychology, The Ohio State University, Columbus, Ohio 43210, USA
[b] Department of Psychology, The University of Texas at El Paso, El Paso, TX 79968, USA

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ABSTRACT

Obesity rates are alarming in various ethnocultural groups, particularly in Hispanics. With Hispanics being the fastest growing group to enter college, the aims of the current study were to examine patterns and correlates of exercise and dietary behaviors in Hispanic college students. Data were collected from 693 Hispanic undergraduates who enrolled online and received course extra credit for participation. Individuals completed questionnaires assessing constructs of the transtheoretical model for three health behaviors (exercise, dietary fat, and fruit/vegetable stages of change) along with demographic, psychosocial, and acculturation measures. Less than 1% of students had 0 obesity-relevant risks, while 68% indicated 2 or more risks. Only 2% of the sample met fruit and vegetable guidelines. Lower income was associated with greater obesity-relevant risks, while stress coping ability was associated with fewer such risks. Findings indicate specific obesity risk behaviors in Hispanic college students and suggest demographic and psychosocial targets for prevention and intervention according to stage of change.



## 1. Introduction

Over two-thirds of Americans are overweight or obese (Flegal, Carroll, Ogden, & Curtin, 2010). Clinical guidelines define adult overweight and obesity as a body mass index (BMI) of 25–29.9 kg/m$^2$ and ≥30 kg/m$^2$, respectively (National Heart, Lung, & Blood Institute, 1998). Obesity is a health concern as it is associated with a number of preventable or reversible medical complications, including diabetes, hypertension, elevated cholesterol, and heart disease (National Heart, Lung, & Blood Institute, 1998).

### 1.1. Obesity and Hispanics

In the United States, 76.9% of Hispanics are overweight or obese (Flegal et al., 2010). Specifically, Mexican American adolescents – of whom 22% are obese and 40% are overweight (Hedley et al., 2004) – are at greater risk for obesity than non-Hispanic White and Black adolescents (Flegal et al., 2010), necessitating an understanding of characteristics associated with overweight in relatively younger Hispanic populations. Moreover, as Hispanics are less likely to seek evidenced-based treatment for weight loss (Tsai et al., 2009), novel interventions that are empirically derived seem warranted in order to garner interest and participation of this particular population.

Known correlates of obesity in Hispanics include poor diet (Allen et al., 2007), acculturation (Hubert, Snider, & Winkleby, 2005), low physical activity, income, and education levels (Bowie, Juon, Cho, & Rodriguez, 2007). Perceived stress and smoking have also been associated with unhealthy eating behaviors in Hispanics (Jenkins, Rew, & Sternglanz, 2005), meriting the investigation of the above factors as potential correlates.

### 1.2. College students

Given that significant increases in weight occur between 18 and 29 years (Mokdad et al., 2003), an examination of activity and eating behaviors in college students is warranted for the development of prevention and intervention efforts, as college is a salient transition period for health behavior change in young adults (Harris, Gordon-Larson, Chantala, & Udry, 2006). In fact, only 37% of Hispanic college students regularly engage in moderate physical activity, while less than one-fourth consume at least five fruits and vegetables daily (Centers for Disease Control & Prevention, 2010).

### 1.3. Transtheoretical model

Research suggests that unhealthy behaviors co-occur, with potentially multiplicative health consequences (Berrigan, Dodd, Troiano, Krebs-Smith, & Barbash, 2003). The most common pattern of health behaviors in U.S. adults involves a lack of adherence to exercise, dietary fat, and fruit and vegetable recommendations (Berrigan et al., 2003). Thus, the rationale underlying research on multiple health behavior

* Corresponding author at: Department of Psychology, University of Texas at El Paso, 500 West University Avenue, El Paso, TX 79968, USA. Tel.: +1 915 747 6270; fax: +1 915 747 6553.
*E-mail address:* tvcooper@utep.edu (T.V. Cooper).

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change (MHBC) is one of maximizing health benefits and reducing healthcare costs (Prochaska, Spring, & Nigg, 2008).

The transtheoretical model (TTM) is one avenue for tailoring MHBC interventions, as it addresses psychosocial and motivational mediators of behavior change (Prochaska & DiClemente, 1983). The TTM conceptualizes temporal behavior change along a cyclical continuum of readiness in five stages (Prochaska & DiClemente, 1983). In *precontemplation*, individuals are not considering change within the next 6 months, while individuals in the *contemplation* stage plan to alter behavior within 6 months; *preparation* individuals have either taken moderate action or intend to act within 1 month. Adequate behavior modifications from zero to 6 months comprise the *action* stage, while the *maintenance* stage entails consistent changed behavior for more than 6 months (Prochaska & DiClemente, 1983).

TTM constructs have been successfully applied to single health behaviors, including smoking (DiClemente et al., 1991), physical activity (Marshall & Biddle, 2001), and diet (Park et al., 2008). The model's efficacy has been demonstrated in two MHBC interventions on smoking, dietary fat, and sun exposure (Prochaska et al., 2004; Prochaska et al., 2005). Nevertheless, ethnic college groups are not widely studied in the TTM literature on MHBC. An expanded understanding of multiple health behaviors in these populations may inform prevention, intervention, and health policy efforts that target specific behaviors at the college level.

One pilot study among college students demonstrated significant increases in physical activity and consumption of healthy fats after a brief image-based intervention (Werch et al., 2007), though similar studies among Hispanic counterparts have yet to be performed.

### 1.4. Aims

As such, the assessment of TTM constructs for activity and dietary behavior change will likely promote more targeted MHBC intervention in the context of obesity risk. Authors examined in Hispanic college students the extent of risk in lack of adherence to physical activity, dietary fat, and 5-A-Day fruit and vegetable recommendations. The co-occurrence of lack of adherence and its correlates was also assessed. Potential sociodemographic correlates of risk included age, sex, income, and acculturation, meaning in this case the degree to which Hispanics have adopted U. S. culture. Health-related correlates included smoking status and BMI. Psychosocial correlates included the level of perceived stress and ability to cope with stress. Individuals in this study were hypothesized to report being in earlier stages of change for the three behaviors; risk was hypothesized to correlate with high acculturation, low income, high BMI, smoking, and greater perceived stress.

## 2. Methods

### 2.1. Participants

Participants were 693 self-identified Hispanic undergraduate students at least 18 years of age on the U.S.–México border. Students were 59% female, with an average age of 19.6 years ($SD = 3.33$ years).

### 2.2. Procedure

Data were collected after Institutional Review Board approval. Students enrolled in psychology classes volunteered online for appointments. Participants provided informed consent and completed questionnaires. Students were debriefed and given course credit for participation.

### 2.3. Measures

Age, sex, annual household income, household size (number of household members), and self-reported height and weight (for BMI calculation) were obtained. Annual household income was divided into four distinct groups: less than US $15,000, between $15,000 and $30,000, between $30,000 and $50,000, and more than $50,000. Household size was included to account for low income scores from single-living students.

The *Rhode Island Stress and Coping Inventory* (RISCI) evaluates perceived stress and coping ability using 12 items (Fava, Ruggiero, & Grimley, 1998). Respondents rate the frequency of items (e.g. "I had no time to relax") within the past month from 1 (Never) to 5 (Frequently). Adequate reliability, internal consistency, and validity have been demonstrated, as well as high correlations with the five-item Mental Health Inventory (Fava et al., 1998). Scores for the stress subscale range from 7 to 35 (higher scores indicate greater perceived stress), while the coping ability subscale ranges from 5 to 25 (higher scores indicate greater coping ability). Adequate reliability was observed in both the stress ($\alpha = .82$) and the coping ability subscales ($\alpha = .81$).

The *Short Acculturation Scale for Hispanics* (SASH) (Marin, Sabogal, Marin, & Otero-Sabogal, 1987) assesses the degree to which Hispanics have adapted to U.S. culture by measuring language, media, and ethnic social relations. Scores range from 1 through 5, with higher scores indicative of greater acculturation. Adequate psychometric properties have been demonstrated for this 12 item measure (Marin et al., 1987), and internal consistency was found in this sample ($\alpha = .91$).

Smoking status was assessed using the *Stage of Change for Smoking Cessation* (*Short Form*), based on a six-item algorithm measuring readiness to quit smoking along TTM stages (DiClemente et al., 1991).

Recommendations for regular exercise, dietary fat reduction, and fruit and vegetable consumption were assessed using staging algorithms, with low scores indicating failure to meet recommendations.

The *Stage of Change for Exercise* (*Short Form*) places respondents into one of five stages of readiness to exercise based on a single item response to a specific definition: "Regular Exercise is any *planned* physical activity (e.g., brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc.) performed to increase physical fitness. Such activity should be performed 3 to 5 times per week for 20–60 min per session. Exercise does not have to be painful to be effective but should be done at a level that increases your breathing rate and causes you to break a sweat. Do you exercise regularly according to that definition?" (Marcus, Selby, Niaura, & Rossi, 1992).

The *Stage of Change* (*Dietary Fat*) evaluates intentions to reduce dietary fat using three steps: the first assesses stage classification based on intentions or actions taken to "consistently avoid eating high fat foods." The second step confirms perceptions of dietary fat avoidance with actual behavior in 5 items (e.g. "Do you often use light, fat free, or no salad dressing?"), while the final step assigns participants whose perceptions do not match behavior into precontemplation, contemplation, or preparation (Greene et al., 1999).

The *Stage of Change* (*5 A Day*) uses two items for fruit and vegetable consumption: the first item assesses the number of fruit and vegetable servings consumed per day (Vallis et al., 2003). The second item evaluates stage of change, in which a response of fewer than five servings is assigned to precontemplation, contemplation, or preparation. Responses of five or more servings are assigned to action or maintenance (Vallis et al., 2003).

### 2.4. Statistical analyses

Stage distributions were reported for each behavior to provide insight into TTM constructs. There were two primary aims: to examine the extent of obesity risk in lack of adherence to multiple health behavior recommendations, and to identify demographic and other correlates of increased risk. First, SOC for each behavior was dichotomized from a 5-stage algorithm to represent obesity risk. Those who reported precontemplation, contemplation, or preparation stages failed to perform or to meet recommendations for the desired behavior and were categorized as being "at risk" (1), while individuals