

# Association of Dysfunctional Eating Patterns and Metabolic Risk Factors for Cardiovascular Disease among Latinos



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## ABSTRACT

**Background** Latinos are at high risk for cardiovascular disease (CVD). Identifying behavioral factors associated with CVD risk in this population may provide novel targets for further research to reduce chronic disease disparities. Dysfunctional eating patterns (emotional eating [EE], uncontrolled eating [UE], and cognitive restraint of eating [CR]) may be associated with CVD risk but little is known about this relationship in Latinos.

**Objective** The aim of this study was to examine associations between dysfunctional eating patterns and metabolic risk factors for CVD in Latinos.

**Design** The study used a cross-sectional design.

**Participants/setting** Latino individuals (n=602), aged 21 to 84 years, were enrolled in the study from September 2011 to May 2013 from a community health center that serves 80% to 85% of the Latino population in Lawrence, MA. Individuals with complete data were included in this analysis (n=578).

**Measures** Dysfunctional eating patterns were measured with the Three Factor Eating Questionnaire-R18V2. CVD risk factors examined included obesity assessed by body mass index and waist circumference and diagnoses of type 2 diabetes, hypertension, and hyperlipidemia abstracted from electronic health records.

**Statistical analysis** Multivariable logistic and Poisson regressions adjusting for age, sex, perceived income, employment, education, physical activity, and perceived stress were performed. The no dysfunctional eating category (ie, no EE, no UE, or no CR) was used as the reference category in all analyses.

**Results** High EE was associated with greater odds of obesity (odds ratio [OR] 2.19, 95% CI 1.38 to 3.45) and central obesity (OR 2.97, 95% CI 1.81 to 4.87), and diagnosis of type 2 diabetes (OR 1.99, 95% CI 1.13 to 3.48) and hypertension (OR 2.01, 95% CI 1.16 to 3.48). High UE was associated with obesity (OR 1.96, 95% CI 1.20 to 3.21) and central obesity (OR 2.33, 95% CI 1.38 to 3.94). Low and high CR were associated with obesity (OR 2.26, 95% CI 1.43 to 3.56 and OR 2.77, 95% CI 1.75 to 4.37, respectively) and central obesity (OR 2.04, 95% CI 1.25 to 3.32 and 2.51, 95% CI 1.54 to 4.08, respectively) and diagnosis of type 2 diabetes (OR 1.83, 95% CI 1.05 to 3.16 and OR 2.73, 95% CI 1.58 to 4.70, respectively) and hyperlipidemia (OR 1.94, 95% CI 1.16 to 3.24 and OR 2.14, 95% CI 1.28 to 3.55, respectively). Lastly, high EE and low and high CR were associated with increased odds of having a greater number of metabolic CVD risk factors (incidence-rate ratio [IRR] 1.33, 95% CI 1.13 to 1.58; IRR 1.34, 95% CI 1.13 to 1.58; and IRR 1.44, 95% CI 1.22 to 1.71, respectively).

**Conclusions** Dysfunctional eating patterns were positively associated with metabolic CVD risk factors in this Latino sample, with dose-response relationships for some associations. Future studies are needed to determine whether dysfunctional eating patterns influence CVD risk factors among Latinos.

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CARDIOVASCULAR DISEASE (CVD) IS THE LEADING cause of death in the United States, including among Latinos/Hispanics (referred to here as Latinos).<sup>1</sup> Compared with non-Latino whites, Latinos are at disproportionately higher CVD risk.<sup>1</sup> Obesity rates are 38.4% and 42.9% for Latino men and women, compared with 34.2% and 32.5% for non-Latino men and women, respectively.<sup>1</sup>

Diabetes rates are 12.5% and 11.8% among Latino men and women, and 7.6% and 6.1% in non-Latino white men and women, respectively.<sup>1</sup> Findings from the Hispanic Community Health Study/Study of Latinos (N=15,079), the largest cohort study of Latino men and women residing in the United States, showed that Latinos between ages 18 and 74 years experience a high burden of metabolic CVD risk factors

(ie, obesity, hyperlipidemia, hypertension, and diabetes).<sup>2</sup> Research has shown that experiencing a greater number of risk factors, namely obesity, diabetes, hypertension, and hyperlipidemia, is associated with greater odds of CVD.<sup>3</sup> Latinos are among the largest and fastest-growing ethnic minority group in the United States, currently comprising 18% of the US population and expected to constitute 24% of the population by 2065.<sup>4</sup> The elevated CVD risk among Latinos in light of the growth of this population has important implications for future health care resource use.<sup>5</sup> Prevention of CVD in this population is a high priority<sup>3</sup>; thus, there is a need to understand factors that contribute to the high CVD risk among Latinos. However, Latinos have been underrepresented in research.<sup>6</sup>

Metabolic CVD risk factors may be influenced by people's behaviors, including their eating patterns. Dysfunctional eating patterns such as emotional eating (EE), uncontrolled eating (UE), and cognitive restraint (CR) have received research attention with regard to CVD risk.<sup>7-12</sup> EE refers to eating in response to emotional rather than hunger cues, UE refers to eating in the absence of hunger as well as sense of losing control over eating, and CR consists of consciously restricting the intake of foods to lose or maintain weight.<sup>13</sup> Several cross-sectional studies have examined associations between EE, UE, and CR and body mass index (BMI) in primarily non-Latino white or European samples and in non-Latino white women or in all-female European samples. These studies have reported positive associations between EE and UE with BMI,<sup>7,8</sup> and mixed associations between CR and BMI with one study finding a negative association between the two and the other three finding a positive association.<sup>9-12</sup> Although it is likely that these dysfunctional eating patterns are associated with experiencing a greater number of CVD risk factors, no studies have evaluated this. Research that identifies potential intervention targets to prevent and mitigate CVD health disparities among Latinos is of critical importance. However, studies evaluating dysfunctional eating patterns in Latinos are scarce; furthermore, associations between EE, UE, and CR and CVD risk factors have not been studied in this group. Thus, the objective of this study was to examine associations between dysfunctional eating patterns, namely EE, UE, and CR, and metabolic risk factors for CVD, including obesity, central obesity, type 2 diabetes, hypertension, and hyperlipidemia in a representative sample of Latino men and women in the northeastern United States. It was hypothesized that experiencing dysfunctional eating patterns will be positively associated with obesity, central obesity, type 2 diabetes, hypertension, and hyperlipidemia.

## METHODS

### Study Design and Participants

This cross-sectional analysis uses baseline data from the Latino Health and Well-Being Project cohort study. From September 2011 to May 2013, the study recruited participants from the Greater Lawrence Family Health Center in the city of Lawrence, MA, a federally qualified community health center that sees an estimated 80% to 85% of the Lawrence area Latino population. Using electronic health records, proportional sampling within specified age (21 to 34 years, 35 to 54 years, and 55 to 85 years) and sex strata randomly selected a pool of potential research participants. Inclusion criteria included

being of Latino or Hispanic ethnicity, Spanish or English speaking, and between ages 21 and 85 years. Exclusion criteria included cognitive or physical impairments for participation, inability, or unwillingness to give informed consent, and plans to move out of the area within the study period (ie, 12 months).

Potentially eligible individuals were contacted via a mailed letter signed by the Greater Lawrence Family Health Center chief medical officer. The letter described the purpose of the study and stated that a study coordinator would call patients to provide additional information about the study, assess eligibility, and inquire about interest in participating. A toll-free number was provided for participants to call in case they wished to opt out. Bilingual trained study personnel contacted each individual approximately 10 days following the mailing. Eligible and interested patients were invited to participate and scheduled for a baseline visit. At this visit, the study staff obtained written informed consent for participation and administered baseline assessments. This study was approved by the University of Massachusetts Medical School Institutional Review Board.

A total of 3,067 patients were evaluated for study eligibility. Of these, 284 were ineligible and 1,547 were unreachable. Among the remaining potential participants, 484 refused participation and 150 did not attend the appointment. A total of 602 individuals enrolled in the study. For the present analysis, 16 participants were excluded due to incomplete data on exposure ( $n=9$ ) or outcome measures ( $n=7$ ), and 8 participants were excluded due to being pregnant, resulting in a sample of 578 participants.

### Measures

Sociodemographic, psychosocial, and anthropometric measures were obtained at a study visit by trained study personnel. In addition, electronic health records were abstracted to ascertain health profiles of participants. Variables included in this analysis are described below.

### Demographic Characteristics and Covariates

Sociodemographic and psychosocial variables were assessed via survey and included sex, age, ethnicity, education, perceived income, and employment status. Ethnicity was assessed with a single item that asked, "What ethnic group do you identify with?" Participants were categorized into three groups: Dominican, Puerto Rican, and other (ie, Cuban, Mexican, Central American, or South American). Education was defined as the highest level of education attained. Perceived income was assessed with a question that asked about level of difficulty to pay monthly bills, with response options being very difficult, somewhat difficult, a little difficult, not at all difficult, does not know, and refused. Working status was categorized as employed, unemployed, disabled, retired, and other. Stress was measured with the widely used Perceived Stress Scale, a 10-item tool that assesses overall level of stress during the past month.<sup>14</sup> Possible response answers are never, almost never, sometimes, fairly often, and very often. Responses are summed and scores range from 0 to 40, with higher scores indicating greater perceived stress. In this sample, Cronbach's  $\alpha$  coefficient was adequate for the Perceived Stress Scale: 0.89. Physical activity was assessed with the nine-item Women's Health Initiative Brief Physical

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