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Association of dysfunctional eating with metabolic risk factors for cardiovascular disease in Latinos

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Abstract

Background: Latinos bear high burden of nutrition related cardiovascular disease (CVD) risk factors. Dysfunctional eating behaviors (emotional eating, uncontrolled eating and cognitive restraint of eating) may influence metabolic CVD risk factors but little is known about this relationship in Latinos. **Objective**: To examine associations between dysfunctional eating behaviors and metabolic risk factors for CVD in Latinos. **Methods**: Latino individuals were recruited from a community health center. Participants completed standardized interviews (i.e., demographics, Three Factor Eating Questionnaire-TFEQ-R18V2, Perceived Stress Scale-10) and anthropometric measurements. Data on diagnosis of type 2 diabetes, hypertension and hyperlipidemia were abstracted from medical records. Statistical analysis included multivariable logistic and Poisson regression models. **Results**: A total of 578 participants (51% female, 67% Dominican), ages 21-84, were included in this analysis. Controlling for age, sex, education and perceived stress high emotional eating (hEE) was associated with greater odds of obesity (OR=2.25 (1.47, 3.24)) and diabetes (OR=1.80 (1.07, 3.01)). High uncontrolled eating (hUE) was associated with obesity (OR=2.16 (1.34, 3.47)) and high cognitive restraint (hCR) was associated with greater odds of obesity (OR=2.55 (1.64, 3.98)), diabetes (OR=2.39 (1.40, 4.04) and hyperlipidemia (OR=1.92 (1.17, 3.14)). Lastly, hEE, hUE and hCR were significantly associated increased odds of having a greater number of the metabolic CVD risk factors (IRR=1.39 (1.20, 1.59), IRR=1.21 (1.04, 1.42), IRR=1.45 (1.24, 1.69); respectively). **Conclusion**: Interventions that target eating behaviors may facilitate reduction of metabolic CVD risk factors and health disparities in CVD among Latinos.

Background

- Latinos are the largest and fastest-growing ethnic minority in the U.S., constituting a fifth of the U.S. population (1).
- Latinos bear a high burden of CVD risk factors with 80% of men and 71% of women having at least one risk factor (2). Compared to non-Latino Whites, Latinos are at disproportionately higher risk for CVD given their higher rates of obesity and diabetes (3).
- The elevated CVD risk among Latinos has important implications given anticipated limitations in future health care resources (4).
- Dysfunctional eating behaviors (emotional eating (EE), uncontrolled eating (UE) and cognitive restraint (CR)) (5) have recently received research attention in regards to CVD risk factors.
    - EE = overeating due to an inability to resist emotional cue.
    - UE = loss of control when eating due subjective feelings of hunger.
    - CR = consciously restricting intake of foods to lose or maintain weight.
- Studies have reported positive associations between EE and UE with obesity (6-8), as well as mixed associations between CR and obesity (8-10) in European and female samples. However, associations between these behaviors and CVD risk factors have not been studied among Latinos.
- Understanding the influence of dysfunctional eating behaviors on CVD risk could provide important intervention targets for populations at high risk for CVD.

Objective

To examine associations between dysfunctional eating behaviors (EE, UE and CR) and metabolic risk factors for CVD, including obesity, diabetes, hypertension and hyperlipidemia in a sample of Latinos in the northeast U.S.

Methods

- **Latino Health and Well-being Study** →recruited low-SES Latinos (ages 21-84) from a community health center in Lawrence, MA. Participants completed surveys (demographics and Three Factor Eating Questionnaire (TFEQ) R18-V2 (10)) during interviews and anthropometrics were measured (weight, height, and waist circumference). Diagnosis of type 2 diabetes, hyperlipidemia and hypertension were obtained from electronic health records.
- EE, UE and CR scores were categorized as: No dysfunctional behavior (scores of zero), or Low (below median) or High (above median). BMI was categorized into obese or non-obese; waist circumference as "at" or "above" the sex-specific CDC guidelines. Number of metabolic CVD risk factors present was calculated by adding up the number of risk factors (i.e., obesity, type 2 diabetes, hyperlipidemia or hypertension) of each participant.

Statistical analyses:
- Multivariable logistic regressions to study associations between each dysfunctional eating behavior and each CVD risk factor.
- Poisson regression models to study association between each dysfunctional eating behavior and number of metabolic CVD risk factors.
- For all models, no EE, UE or CR was used as referent category and were adjusted for age, sex and education. SPSS program version 23 was used.

Results

Table 1. Demographic characteristics of the Latino Health and Well-Being Study sample (N=578)

Characteristics	Total Sample N (%)
Female	293 (50.7)
Age (in years)	
21-34	168 (29.1)
35-54	202 (34.9)
55-84	208 (36.0)
Ethnicity†	
Puerto Rican	90 (15.8)
Dominican	381 (66.7)
Other	100 (17.5)
Education	
<High School	247 (42.7)
<High School with vocational school	53 (9.2)
High school graduate	63 (10.9)
High school graduate with vocational training	50 (8.7)
Some college	99 (17.1)
College graduate or Post-graduate	66 (11.4)

†Data missing for 7 participants.

Figure 1. Prevalence of metabolic CVD risk factors among the Latino Health and Well-being Study participants
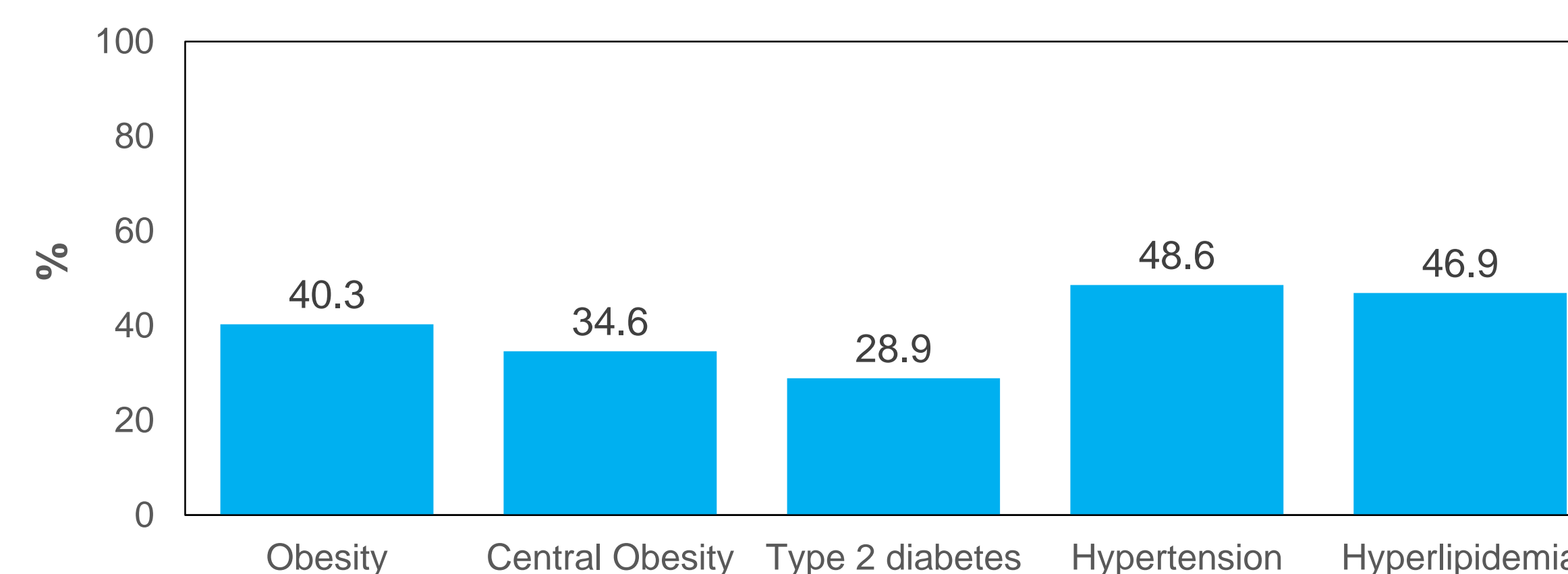

Figure 2. Number of metabolic CVD risk factors among the Latino Health and Well-being Study participants
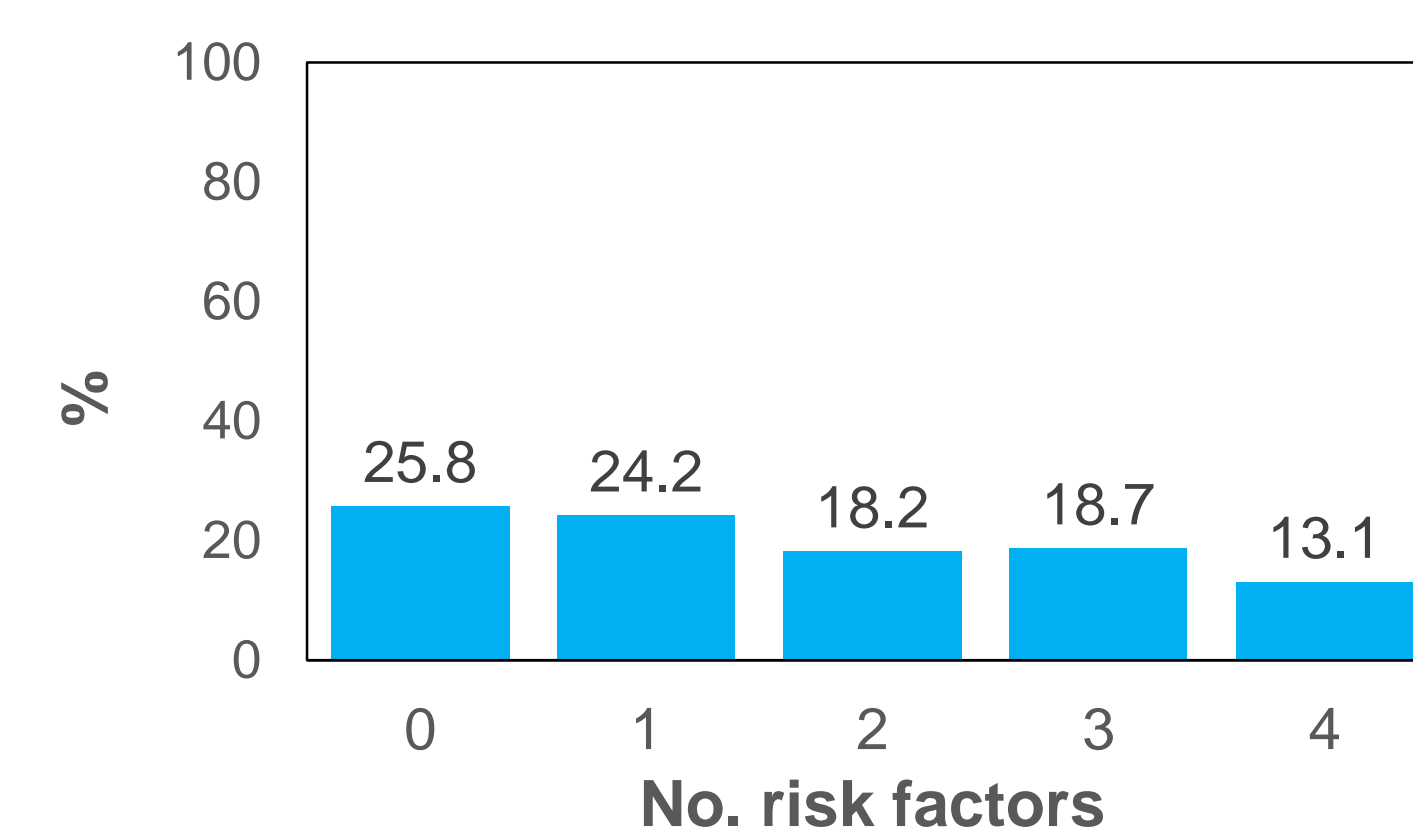

Table 3. Logistic regression analysis of dysfunctional eating behaviors and metabolic CVD risk factors.

	Obesity OR (95%C.I.)	Central Obesity OR (95%C.I.)	Diabetes OR (95%C.I.)	Hypertension OR (95%C.I.)	Hyperlipidemia OR (95%C.I.)
EE					
Low EE	1.23 (0.81, 1.88)	1.28 (0.81, 2.02)	1.68 (1.03, 2.74)*	1.02 (0.63, 1.65)	1.20 (0.75, 1.91)
High EE	2.24 (1.43, 3.51)*	2.73(1.69, 4.40)*	1.84 (1.06, 3.18)*	1.63 (0.95, 2.78)	1.39 (0.83, 2.34)
UE					
Low UE	1.38 (0.87, 2.20)	1.02 (0.63, 1.69)	1.21 (0.72, 2.04)	0.76 (0.45, 1.31)	0.74 (0.44, 1.24)
High	2.09 (1.29, 3.39)*	2.13 (1.28, 3.54)*	1.38 (0.79, 2.41)	0.92 (0.53, 1.61)	1.05 (0.61, 1.81)
CR					
Low CR	2.18 (1.41, 3.39)*	1.99 (1.24, 3.19)*	1.71 (1.00, 2.89)*	1.17 (0.71, 1.94)	1.83 (1.12, 2.99)*
High CR	2.58 (1.65, 4.04)*	2.27 (1.41, 3.64)*	2.40 (1.41, 4.07)*	1.41 (0.85, 2.34)	1.93 (1.18, 3.17)*

EE: emotional eating, UE: uncontrolled eating, CR: cognitive restraint. All models are adjusted for age, gender, stress and education. No EE, No UE and No CR used as reference categories. *Statistically significant, p<0.05

Results (continued)

Table 4. Poisson regression of dysfunctional eating behaviors and number of metabolic CVD risk factors.

	IRR (95%C.I.)
EE	
Low EE	1.12 (0.96, 1.31)
High EE	1.30 (1.10, 1.53)*
UE	
Low UE	0.99 (0.84, 1.17)
High	1.13 (0.95, 1.34)
CR	
Low CR	1.32 (1.12, 1.56)*
High CR	1.41 (1.20, 1.67)*

EE: emotional eating, UE: uncontrolled eating, CR: cognitive restraint. All models are adjusted for age, gender, stress and education. No EE, No UE and No CR used as reference categories. *Statistically significant, p<0.05

Discussion and Conclusion

- Dysfunctional eating behaviors were associated with metabolic risk factors for CVD in this sample of Latino men and women residing in the U.S.
- Consistent with other studies in European (6-8) and female (11) samples, hEE was associated with obesity. In addition, studies in European populations showed that disinhibition (a scale from the original TFEQ that contains EE items) was positively associated with diabetes (12,13), providing indirect support for our finding of EE and diabetes.
- The observed positive association between hUE and obesity is consistent with studies of female (11) and European populations (15). Our study also confirms previous findings of no association between hUE and diabetes (7).
- In our sample, CR was associated with higher odds of obesity, diabetes and hypercholesterolemia also consistent with prior studies in all female samples (8,11) and European populations (9, 12, 13)
- EE, UE and CR may influence CVD risk factors by affecting food selection. hEE has been associated with greater intake of palatable foods (16), which may contribute to development of these risk factors. hUE has been associated with greater intake of calories and fats (16) and thus may contribute to obesity through a positive energy balance. Lastly, under certain conditions, such as when distracted, individuals with hCR engage in greater caloric intake (17), which also may contribute to obesity and other metabolic CVD risk factors
- Identifying modifiable behavioral targets for CVD risk prevention is critical to mitigate ethnic disparities in CVD. Additional studies are needed that longitudinally examine the association between dysfunctional eating behaviors and the development of risk factors for CVD, and that test interventions for modifying both.

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