The Association between Obesity and Health-Related Quality of Life among Urban Latinos

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Objectives: To examine differences in health-related quality of life (HRQL) by obesity status in a community-based sample of urban Latinos. To determine if sex moderates the relationship between HRQL and obesity status in this cohort.

Design, Setting and Participants: Cross-sectional study of 202 foreign-born Latinos with low levels of acculturation, living in an urban setting.

Main outcome measure: Health-related quality of life by the Medical Outcomes Study Short-Form Health Survey (SF-12).

Methods: Including the entire study cohort, *t*-tests were used to determine the unadjusted difference between obese and non-obese participants on SF-12 physical and mental functioning scores (PCS and MCS, respectively). Linear regression was used to estimate the adjusted difference in SF-12 scores between obese and non-obese participants after adjusting for potential confounders. The association between obesity status and HRQL summary scores were then assessed separately in men and women both with and without adjustment for potential confounders.

Results: There was a small but statistically significant unadjusted difference between obese and non-obese participants in the physical functioning domain of HRQL (−2.2, 95% CI −4.0, −.4), which was no longer significant in multivariate analysis (difference −1.5, 95% CI −3.3, .3). There were no significant differences in mental functioning scores in unadjusted or adjusted analyses. Sex did not moderate the relationship between obesity status and HRQL scores in stratified analyses.

Conclusions: Our results in an under-studied population suggest that obesity may have little impact on HRQL in urban Latinos. Future studies with larger and more diverse Latino populations are needed to further investigate the relationship between obesity and HRQL, and explore how acculturation impacts the association between these two factors. (*Ethn Dis*. 2014;24[1]:14–18)

Key Words: Health-related Quality of Life, Latino Health, Obesity, Acculturation

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Introduction

Latinos are the nation's largest and fastest growing minority group, which has impelled researchers, practitioners, and policymakers to identify and address health problems that disproportionately affect this vulnerable population.[1] Obesity is one such condition with higher prevalence in Latinos (39%) than in the overall US population (34%).[2] This difference is even more pronounced among women, with 45% of Mexican-American women being obese compared to 35% of all women.[2] This health disparity results from a complex interaction of genetic, sociocultural, environmental, and behavioral factors, in addition to impaired health care access among Latinos.[3–7] High obesity rates in Latinos influence their development of related comorbidities, such as diabetes and heart disease, and also adversely impact their quality of life.

Health-related quality of life (HRQL), an individual measure of perceived functional status, has been widely studied and consistently shown to be diminished in the setting of many health conditions.[8] Many studies have demonstrated the inverse relationship between weight and HRQL, with obese individuals experiencing lower HRQL than their non-obese counterparts.[9,10] Health-related quality of life instruments, such as the Medical Outcomes Study Short-Form Health Survey, measure two broad domains of HRQL—physical and mental health functioning—both of which are consistently lower in obese compared to non-obese individuals.[11] There is also evidence that obesity adversely affects women's physical and mental functioning more than it does men's.[9] Much of the existing literature on obesity and its association with HRQL is limited by self-reports of obesity status and small numbers of Latinos.

We sought to examine differences in HRQL by obesity status in a community-based sample of urban Latinos. Based on previous research, we hypothesized that obesity would be associated with lower HQRL in our Latino cohort. As a secondary objective, we explored whether the relationship between obesity and HRQL in this urban Latino population differed by sex. We hypothesized that the association between obesity and HRQL would be stronger among women in our sample, which has been demonstrated in other demographic groups. Understanding the association between obesity and HRQL in urban Latinos provides insight into this population's subjective experience of

We hypothesized that the association between obesity and health-related quality of life (HRQL) would be stronger among women in our sample, which has been demonstrated in other demographic groups.

being obese, which in turn may impact how practitioners and policymakers approach this prevalent health condition in Latino communities.

METHODS

Study Design And Sample

The study protocol was approved by the University of Pennsylvania Institutional Review Board. We conducted a cross-sectional study of Latino adults (N=202) in a Philadelphia neighborhood that has experienced a recent influx of Latino immigrants, mostly from Mexico. All adults aged 18 to 65 and of self-reported Hispanic or Latino ethnicity were eligible to participate. Recruitment activities, administration of surveys, and collection of measured anthropomorphic data were conducted in community settings (eg, local nonprofit organizations, churches, local businesses). Our study was conducted by a group of community health workers from the target population, who have prior experience conducting health research.[12–14]

Table 1. Participant sociodemographic and anthropomorphic characteristics, *N*=202

Characteristic	*n* (%)
Age	
20–29	62 (31)
30–36	72 (35)
37–61	68 (34)
Female sex	128 (63)
Foreign born	202 (100)
Country of origin	
Mexico	183 (91)
Other	19 (9)
Years living in the United States	
0–5 years	61 (30)
6–10 years	77 (38)
>10 years	64 (32)
Educational attainment	
≤6 years	55 (27)
7–11 years	95 (47)
≥12 years	52 (26)
Marital status	
Never married	32 (16)
Married	150 (74)
Widowed/separated/divorced	20 (10)
Acculturation level[a]	
Low	179 (89)
High	23 (11)
Weight status[b]	
Normal weight	35 (17)
Overweight	90 (45)
Obese	77 (38)

[a] Acculturation was determined using the Marin short acculturation scale.
[b] Weight status was determined by BMI categories: normal (18–24.9); overweight (25–29.9); obese (≥30).

Instruments

Health-related quality of life was assessed by the Medical Outcomes Study Short-Form Health Survey (SF-12), which has been validated in both English- and Spanish-speaking populations.[15,16] The total HRQL score is composed of two summary scores, which measure physical and mental health functioning (PCS and MCS, respectively). We chose to examine these summary scores in our analysis because of their high validity and ease of interpretation.[15] Scores on these summary measures are continuous and higher scores indicate greater HRQL. Weight was determined using a calibrated digital scale and height was measured using a portable stadiometer. Participants' height and weight were used to calculate their body mass index (BMI, kg/m^2). Acculturation – or the process by which immigrants modify their behaviors, values and norms as a result of contact with a new culture – was assessed using a widely utilized instrument developed by Marin et al and validated for use with Latino populations.[17] In addition, we collected data on the following sociodemographic characteristics: sex, age, country of origin, length of US residence, educational attainment, and marital status. The entire survey was administered in Spanish.

Data Collection

Surveys were administered verbally by community health workers using smartphones with embedded skip patterns where appropriate. Data were entered by the community health workers into an Android-based platform (Click Diagnostics, Cambridge, MA), which automatically exported the resulting data via cellular network to a HIPAA-protected, web-based spreadsheet.

Statistical Analyses

Descriptive statistics were used to examine participants' sociodemographic and anthropomorphic characteristics. We dichotomized obesity status into obese (n=77) and non-obese (n=125) categories for use in bivariate analysis. Using chi-square tests, we examined the association between participants' sociodemographic characteristics and obesity status. We used t-tests to determine the unadjusted mean difference and 95%

confidence interval between obese and non-obese participants on SF-12 MCS and PCS. Using linear regression, we estimated the adjusted mean difference and 95% confidence interval between obese and non-obese participants on MCS and PCS scores. All variables were entered into multivariate models as categorical variables in the manner in which they are presented in Table 1, with the exception of age and years lived in the United States. Acculturation was modeled as a categorical variable rather than a continuous variable because of its skewed distribution. We also examined the association between these HRQL summary scores and obesity status separately in men and women to explore sex as a potential effect modifier of the primary relationship under study. In these stratified multivariate analyses, all variables were modeled as described above. All analyses were conducted using Stata SE, version 11.1 (Stata Inc., College Station, TX).

Table 2. Obesity status by participant sociodemographic characteristics, *N*=202

Characteristic	% obese	*P*[a]
Age		
20–29	32	
30–36	35	.17
37–61	47	
Sex		
Male	38	.95
Female	38	
Country of origin		
Mexico	38	.90
Other	36	
Years living in the United States		
0–5 years	36	
6–10 years	32	.20
>10 years	46	
Educational attainment		
≤ 6 years	42	
7–11 years	34	.47
≥12 years	42	
Marital status		
Never married	38	
Married	36	.26
Widowed/separated/divorced	55	
Acculturation level[a]		
Low	39	.21
High	27	

[a] *P* are for the difference in % obese across strata of the participant characteristics.

RESULTS

All of the participants were foreign-born Latinos with the majority originally from Mexico (91%) (Table 1). The study population was young (mean age 34 years, SD 8.7), with low levels of educational attainment and acculturation. The average BMI was 29.3 (SD 5.4) and 83% percent of the participants were overweight or obese. There were no statistically significant associations between participants' sociodemographic characteristics and obesity status (Table 2).

The distribution of participants' unadjusted mental (MCS) and physical (PCS) HRQL scores by obesity status is presented in Table 3, first for the entire cohort and then separately by sex. There was a significantly lower physical functioning score among obese than non-obese participants when including the entire cohort (difference of −2.2, 95% CI −4.0, −.4). The difference in unadjusted mental functioning scores between obese and non-obese participants was not significant (−1.6, 95% CI −4.2, .9). After adjustment for covariates, there were no significant differences in mean physical or mental functioning scores between obese and non-obese participants (Table 4). In unadjusted and adjusted analyses, there were no significant differences in mental or physical functioning scores by obesity status when examining this association separately in men and women. When including an interaction term for sex

Table 3. Unadjusted SF-12 Mental and Physical Component Summary Scores by obesity status

SF-12 Score[a]	Not Obese, BMI<30	Obese, BMI ≥ 30	Difference[b] (95% CI)
MCS score			
All	46.3	44.7	−1.6 (−4.2, .9)
Women	46.4	44.0	−2.4 (−5.8, .9)
Men	45.9	45.7	−.2 (−4.2, 3.8)
PCS score			
All	48.3	46.1	−2.2 (−4.0, −.4)
Women	47.0	45.2	−1.8 (−4.1, .4)
Men	50.5	47.7	−2.8 (−5.8, .2)

[a] SF-12 MCS and PCS scores are expressed as the mean within each group.
[b] SF-12 scores in obese participants minus adjusted SF-12 scores in non-obese participants with corresponding 95% confidence intervals.

Table 4. Adjusted SF-12 Mental and Physical Component Summary Scores by obesity status

SF-12 Score[a,b]	Not Obese, BMI<30	Obese, BMI ≥30	Difference (95% CI)[c]
MCS score			
All	46.2	44.8	−1.4 (−4.1, 1.3)
Women	46.4	44.2	−2.2 (−5.7, 1.3)
Men	45.7	46.1	.4 (−4.0, 4.8)
PCS score			
All	48.0	46.5	−1.5 (−3.3, 0.3)
Women	46.9	45.4	−1.5 (−3.7, 0.7)
Men	49.9	48.6	−1.3 (−4.5, 1.8)

[a] SF-12 MCS and PCS scores are expressed as the adjusted mean within each group.
[b] Adjusted SF-12 MCS and PCS scores, differences by obesity status and corresponding 95% confidence intervals were estimated using linear regression models adjusting for age (continuous), educational attainment, marital status, acculturation, and years lived in the United States (continuous).
[c] Adjusted SF-12 scores in obese participants minus adjusted SF-12 scores in non-obese participants with corresponding 95% confidence intervals.

and obesity status in multivariate models for both MCS and PCS, the coefficients were not significant (data not shown).

DISCUSSION

Our unadjusted analysis shows a small, but statistically significant difference in the physical functioning domain of HRQL between Latinos with and without obesity. This difference would be considered marginally clinically significant, which has been defined as an absolute difference of 3 on SF-12 component scores.[18] The small difference we observed was attenuated and no longer significant in our adjusted analysis. We found no significant difference in mental functioning scores between obese and non-obese participants in our study. The relationship between obesity and HRQL did not differ significantly by sex, suggesting that sex may not moderate the primary relationship under study.

The greatest strength of our study was the population sampled. Given the underrepresentation of Latinos in existing research on obesity and HRQL, our study contributes to the literature by focusing only on this population. The Latino population studied here is unique with respect to its cultural background. One hundred percent of the participants were foreign born, and almost 90% had low levels of acculturation, in contrast to most studies including Latinos. Our use of measured, rather than self-reported anthropomorphic data represents another strength of our study. Given the documented inaccuracy of self-reported weight in survey studies,[19] our study may have resulted in less misclassification within weight categories.

The cross-sectional nature of our study hinders our ability to draw causal inferences about the impact of obesity on HRQL in this population. However, a causal link between our exposure and outcome has been established by prospective studies reporting obesity-related decrements in HRQL.[20,21] Because of the unique nature of the study population, our findings are not generalizable to all Latino communities. Another limitation of our study is that we did not collect detailed comorbidity data, which may have provided a more complete picture of HRQL in our cohort.

Previous research examining this relationship has consistently demonstrated that obesity hinders HRQL, and that greater degrees of obesity are associated with greater impairment.[11] The same review reported that obesity has a larger impact on individuals' physical functioning than their mental functioning. We found significantly lower physical functioning in obese compared to non-obese participants, which was no longer significant after adjusting for potential confounders. We found no significant difference between the same groups with respect to mental functioning in either unadjusted or adjusted analyses. We may have failed to demonstrate a significant difference in mental functioning by obesity status due to low baseline scores in relation to other study populations.[22] An alternative explanation is that mental functioning was preserved in our cohort because Latino immigrants exhibit lower levels of mental illness than either US-born Latinos or other ethnic groups.[23] Previous studies examining the association between obesity and HRQL have reported that women exhibit lower levels of HRQL than men for the same BMI.[24,25] We did not find effect modification by sex in our stratified analysis, which may have resulted from inadequate statistical power to examine sex differences in our cohort.

Our study showed modest differences in HRQL between obese and non-obese Latinos. The magnitude of these differences was smaller than those reported in other studies that included participants from different demographic groups. Future research on obesity and HRQL should enroll greater numbers of Latinos, and include diverse Latino populations to enable investigation of acculturation's influence on these two factors. As health care stakeholders increasingly recognize that Latinos display significant heterogeneity with respect to health behaviors and comor-

Our study showed modest differences in health-related quality of life (HRQL) between obese and non-obese Latinos.

bidities,[26] understanding how obesity impacts Latino subgroups differently may offer important insights to guide clinical care and community-based weight loss programs. Employing mobile technology, like that used in our study, and community health workers may prove effective strategies for future studies and interventions targeting diverse Latino populations that are difficult to reach in mainstream settings.

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