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The Missing Men: High Risk and low use of health care in Men of Mexican Origin

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Abstract

Objective—We sought to determine gender- and age-specific prevalence of chronic diseases in an urban Mexican American border community.

Methods—The Cameron County Hispanic Cohort (CCHC n=2000) was selected using a multi-staged cluster design. Sociodemographic, anthropometric measures and blood samples were collected on each participant.

Results—More women were obese (55.1%) than men (44.8%). Men had significantly higher rates of diabetes (20.4% for men vs 15.8% for women: $p<.05$) and undiagnosed diabetes (6.2% for men vs 2.4% for women: $p<.01$), the prevalence of diabetes rose steeply between the ages of 40 and 49 years. Men were significantly more likely to have serum cholesterol levels of ≥200 mg/dL and elevated LDL (22.6% versus 26.1%, $p<.01$).

Conclusions—Mexican American males in the US/Mexico border region have a high prevalence of obesity in younger men and higher overall rates of diabetes, including undiagnosed diabetes, and significantly higher serum cholesterol levels.than women.

Introduction

We have recently reported a high prevalence of obesity and diabetes in an urban cohort of Mexican Americans living on the US/Mexico border (Fisher-Hoch et al., 2010). These trends are slightly higher than those observed nationally (Samet et al., 1998; Umpierrez et al., 2007) which create real concern about the future health of this ethnic group (Beard et al., 2009) since it is well established that obesity and diabetes lead to adverse health outcomes (Duncan & Schmidt, 2006; Haffner, 2006). Improving Mexican American health depends on clear understanding of the risk factors for this population.

In general, the health of men in all racial/ethnic groups is not as good as that of women. This has been best documented for African Americans (Williams, 2008). Women outlive men an average of 5 years in the United States (Heron et al., 2006), yet both men and women share similar risk for cardiovascular disease and diabetes (American Heart Association, 2010). A family history of cardiovascular disease is a greater risk factor for having coronary artery disease in men than women (Pitsavos et al., 2008), while gender differences in the association between the NCEP metabolic syndrome and cardiovascular disease mortality depend on diabetes status (Hunt et al., 2007). Furthermore, some evidence suggests that the effect of dietary intake on the proliferation of metabolic syndrome and insulin resistance may differ by gender (Eilat-Adar et al., 2007).

Many of the underlying gender differences in risk factors for chronic and non-communicable diseases are social and economic in nature, particularly lower socioeconomic status (Williams, 2008). Women and men differ substantially in lifestyle and health behaviors that contribute to the risk of obesity, diabetes and cardiovascular diseases. Men are more likely to smoke and abuse alcohol than women, while women are less likely to exercise (Vega et al., 1987); women are more likely to seek medical care than men. These differences are also documented in the Mexican American population (Wilkinson et al., 2005).

The current study uses data from the Cameron County Hispanic Cohort (CCHC), a cohort study of Mexican American adults living in the Brownsville, Texas, metropolitan area. The purpose of this study is to document gender-specific prevalence of diabetes and cardiovascular disease risk factors in Mexican Americans living in a largely Hispanic urban area in the South Texas border region. In addition, comparison will be made of self-reported conditions to actual measured biomarkers to estimate undiagnosed conditions in this sample.

METHODS

Study Population and Sample

The Cameron County Hispanic Cohort (CCHC) is a sample of community-residing, Mexican-origin adults 18 years of age or older. The sample was chosen using a multi-cluster design from randomly selected first and third socioeconomic quartile census tracts in the city of Brownsville, Texas (Fisher-Hoch et al., 2010). The total sample consists of 2,000 subjects.

Medical Questionnaire and Clinical examination

Participants were invited to our Clinical Research Unit (CRU), and sociodemographic and medical questionnaires, anthropometric and clinical measurements collected as previously described (Fisher-Hoch et al., 2010). For this study we accessed self-reported diagnosed diabetes, hypertension, and high cholesterol. Self-reported current medications were recorded, and independently verified by CRU personnel later in the interview by inspection of medications that we asked the participants to bring to the clinic. Fasting blood specimens were processed and glucose determined as described (Fisher-Hoch et al., 2010).

Clinical definitions

Undiagnosed diabetes was defined for those participants who reported not having a prior diagnosis of diabetes, were not taking diabetes medications, but had a fasting blood sugar of ≥126 mg/dl or greater on two occasions. Similarly undiagnosed hypertension was defined as elevated blood pressure in participants who did not self-report having been diagnosed by a physician and who were not taking blood pressure medications, yet were recorded with systolic blood pressure of ≥140 mm/HG (American Heart Association, 2009). Cholesterol of ≥200 mg/dl was considered elevated regardless of whether the participant reported prior diagnosis or used cholesterol lowering medications. Elevated low density lipoprotein (LDL) was considered ≥130mg/dL. While sex-specific thresholds have been set for high density lipoprotein (HDL), in this study we opted to use the value of 60 mg/dL or higher as a cut off as specified by the American Heart Association for protection against cardiovascular disease for both men and women (American Heart Association, 2009).

Data Analysis

Descriptive statistics were generated using STATA 11 SE (STATA 11 SE) by gender and age group. Chi square and t-test statistics were used to determine significant bivariate relationships between outcome variables and gender. Logistic regression analysis was conducted for the self-reported and biomarker variables that had significant bivariate relationships with gender in the descriptive statistics. Two logistic models were developed; an unadjusted model and a model adjusting for sociodemographic covariates (i.e. age, nativity, education, employment status, insurance status and marital status). Finally, interaction effects were estimated for gender by age for each outcome. All analyses were conducted using sampling weights, and adjustments were made for potential strata and clustering effects.

Confidentiality and approval

The study and all instruments were approved by the Committee for the Protection of Human Subjects of the University of Texas Health Science Center-Houston and all CRU procedures conformed to Good Clinical Practices guidelines.

RESULTS

Sociodemographic characteristics by gender are shown in table 1. As previously reported (Fisher-Hoch et al., 2010) there were more women participants than men, but there was no difference in age distribution between genders. A higher proportion of women than men were divorced or separated, and more women were born in Mexico. Men were more likely to have graduated from high school and to have family income greater than $20,000. Nearly one half of the men were employed full-time compared with less than a quarter of the women, but nearly three quarters of all participants had no health insurance, again more prevalent in women than men.

The association of obesity, diabetes, blood pressure, cholesterol and obesity by gender and by age group is shown in table 2. Overall a greater proportion of men than women were overweight, having BMI values in the 25 to 29 range (36.9% versus 30.2%, $p<.001$). A significantly higher proportion of women than men were obese (i.e. BMI ≥ 30). However, when comparing at category levels significant bivariate differences were only observed for Categories II and III (Category II 12.6% vs. 10.6%; Category III 9.7% vs. 5.7%). By age group, there were a greater proportion of women in the obese categories, with one exception. In the 30 to 39 age group, men had substantially higher proportion of subjects who were Category II obese (21.4% vs. 11.2%). Still, there were a greater proportion of men who were overweight in the 30 to 39, 40 to 49, 50 to 59 and 60 to 69 age groups.

There were no significant differences between men and women in diagnosed diabetes; however, men had significantly higher proportion of undiagnosed diabetes (6.2% vs. 2.4%) and after making the adjustment for the undiagnosed, a higher proportion of total diabetes (20.4% vs. 15.8%). Figure 1 illustrates the trends in total diabetes and undiagnosed diabetes for men and women by age group. For both men and women there is a low prevalence of total diabetes and undiagnosed for subjects under the age of 30. However, the proportion of total diabetes is much larger for men than for women. This trend is similar for each age group until the 70 years or greater age group where a greater percentage of women than men are represented in total diabetes. The greatest gender differences for undiagnosed diabetes appears to be within the 40 to 49, 50 to 59, and 60 to 69 age groups.

A significantly lower proportion of men reported having been diagnosed with hypertension (20.1% vs. 26.2%), however there was no significant difference in undiagnosed hypertension between men and women. Similarly, there were no significant differences between women and men in self-reported high cholesterol. There was, however, a significantly higher proportion of men than women who had serum cholesterol levels of 200 mg/dL or greater (36.9% vs. 32.9%). Overall, a lower percentage of men than women had high HDL levels (≥60 mg/dL, 4.3% versus 14.3%, p<.001) but a higher proportion had elevated LDL levels of ≥130 mg/dL (26.1% vs. 22.6%, p<.01). Figure 2 illustrates differences between men and women with self-reported and measured cholesterol levels ≥200 mg/dL by age. There is an impressive discrepancy between self-reported and measured serum total cholesterol ≥200 mg/dL among men, not seen among women, most notably below the age of 50. Starting around middle age the gap between self-reported and measured serum cholesterol ≥200 mg/dL narrows dramatically.

Table 3 presents odds ratios from logistic regression for outcomes with significant bivariate relationships with gender from Table 2 (i.e. BMI, self-reported hypertension, undiagnosed diabetes, total diabetes, serum cholesterol 200 or more, HDL 60 or greater, LDL 130 or greater, and BMI). In model 1 men had a significantly lower odds of having BMI values of 40 or above (OR=.565, (95% C.I. .385, .813)), but significantly higher odds of BMI values in the 25 to 29 range (OR=1.35, (95% C.I. 1.04, 1.75)). Men had lower odds of self-reported hypertension (OR =.709 (95% C.I. .543, .926)), however, men significantly higher odds of having undiagnosed diabetes than women (OR= 2.65, (95% C.I. 1.59, 4.43)) and higher odds of total diabetes (OR=1.37, (95% C.I. 1.04, 1.79)). In addition men had a lower odds of HDL level greater than or equal to 60 (OR=.433, (95% C.I. 263, 714)).

The age and gender interaction model in Table 3 revealed significant effects for BMI, self-reported hypertension, undiagnosed diabetes, total diabetes, serum cholesterol 200 mg/dL or greater, HDL and LDL. The odds for self-reported hypertension were significantly higher for men in age groups 40 to 49 (OR=3.09), 50 to 59 (OR= 10.41) , 60 to 69 (OR= 15.08) and 70 and older (OR=5.50). Similarly, the odds of undiagnosed diabetes were significantly greater for men at ages 40 to 49 (OR=8.86), 50 to 59 (OR=11.84) and 60 to 69 (OR=8.22). For both total diabetes and serum cholesterol ≥ 200 mg/dL men had significantly higher odds at ages 30 to 39 (total diabetes OR=3.37, serum cholesterol OR=4.01), 40 to 49 (total diabetes OR=6.45, serum cholesterol OR=6.31), 50 to 59 (total diabetes OR=13.14, serum cholesterol OR=5.12) and 60 to 69 (total diabetes OR=11.69, serum cholesterol OR=4.50). Men had significantly lower odds of HDL ≥ 60mg/dL at ages 18 to 29 (OR=.09) and 30 to 39 (OR=.27). Men had higher odds of LDL ≥ 130mg/dL at age groups 30 to 39 (OR=3.24), 40 to 49 (OR=3.37) and 50 to 59 (OR=2.48). Interaction effects for BMI were less straight forward. Men between the ages of 30 and 39 were more likely to be of normal weight compared with women in the same age group (OR= 3.33). Men aged 60 to 69 were more likely to be in the overweight range compared with their female peers (OR= 2.78).

Discussion

The purpose of this study was to report the gender-specific prevalence of diabetes and cardiovascular disease risk factors and to estimate undiagnosed disease in a sample of Mexican Americans. Although the findings from this study show overall high disease load for men and women, men carry a large burden of obesity and undiagnosed disease, which has serious implications for public health and educational intervention efforts, and overall much less attention has been given to men's health, particularly among minorities. Nearly 60% of the men in their 30s were obese. This contrasts with national data where approximately 27.5% of relatively healthy young men were obese (Flegal, 2010). Compared to Mexican Americans in the same age range the prevalence is approximately 33.8%. Therefore, young Mexican American men in this study have a substantially higher prevalence of obesity. Widening gaps in ethnic disparities in obesity prevalence have been documented elsewhere (Acton et al., 2002; Flegal et al., 2002). Furthermore, greater prevalence of overweight and obesity have been documented in Mexican American adolescent males compared to their female counterparts (Forrest & Leeds, 2007).

Men in this study carried a greater burden of diabetes than women. A larger proportion of men than women had undiagnosed and therefore likely to be untreated diabetes than women in all age groups. In the oldest group of men (over 70 years), however, there was a lower proportion of diabetes than for women which may reflect gender differentials in survival to older age in persons with diabetes (De et al., 2009). In this study 44.3% of 60-69 year-old men had diabetes, but only 19.8% when they reached 70 years, possibly, as has been suggested, due to a survival effect (Barcelo et al., 2007). It has been proposed that the particular susceptibility to diabetes of Mexican Americans in Texas, New Mexico and elsewhere compared with other Hispanics may be due to admixture of American Indian genes (Samet et al., 1998).

The same pattern that was observed for diabetes was seen in the lipid profiles of men. A high proportion of elevated cholesterol was seen between the ages of 30 and 70. This difference was also observed with HDL and LDL, where men had lower odds of HDL ≥ 60mg/dL, and higher odds of LDL ≥ 130mg/dL. Women traditionally are more likely to access health care than men, and women outlive men an average of five years in the United States (Arias, 2007). The high prevalence of undiagnosed diabetes and elevated cholesterol among men in this study suggest that they may not have adequate access or choose not to access preventive care to reduce the risk of cardiovascular disease and other complications in the same way women do despite their higher likelihood of being insured (Deeks et al., 2009).

The current study suffers from several limitations, not least that it is a cross sectional study, and some of the conclusions needed to help us understand the health implications are better served by longitudinal data. In addition there was a lower representation of men than women in this sample. A serious problem in developing a cohort in a minority community, as in many others, is the difficulty in obtaining participation (Murphy et al., 2009).The men who decline may be healthier and socioeconomically better off than those who participate, may be less likely to be able to give their time or may have greater mistrust of researchers than the women. There is no documentation or means of determining these effects. Using sampling weights in our analysis is a way to ensure equal representation of both genders as well as age groups since they were developed to remove any age and gender imbalance in the sampling scheme.

The prevalence of both obesity and diabetes in both genders in this population is high and already apparent in the younger participants. These rates exceed the elevated rates reported nationally for Mexican Americans (Barcelo et al., 2007; Fisher-Hoch et al., 2010). A majority of women are obese, many morbidly obese, even at a young age. Most have no health insurance and they are more socioeconomically disadvantaged than the men. However, these women apparently receive sufficient health care or at the least pay enough attention to their health, to have significantly less undiagnosed diabetes, hypercholesterolemia and hypertension than men. Though our data are obtained through cross-sectional study design, it can be argued that the high rates of obesity in the younger men coupled with lack of health care and inattention to their health precede significantly higher rates of undiagnosed diabetes as they grow older, and, eventually earlier mortality. The implications for long term cost to the economy, health care and the community are considerable.

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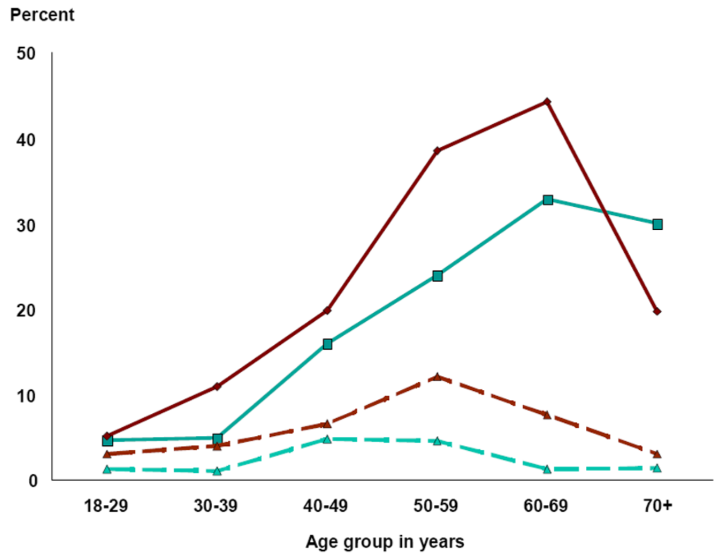

Figure 1.
Total diabetes and undiagnosed diabetes in men and women by age group in the Cameron County Hispanic Cohort. Solid lines=total diabetes, dotted lines=undiagnosed diabetes. Brown lines=men, blue lines=women.

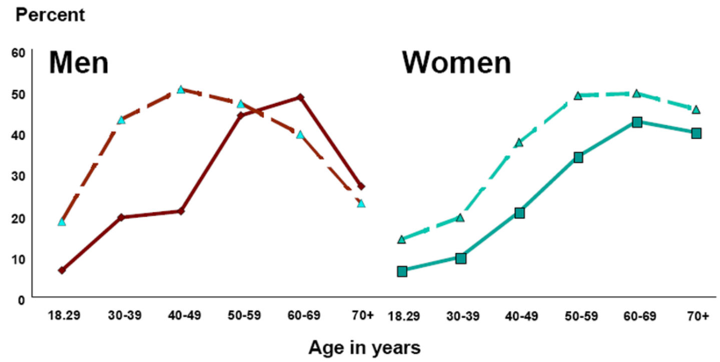

Figure 2.

Self-reported and undiagnosed elevated plasma cholesterol in men and women by age group in the Cameron County Hispanic Cohort. Solid lines=self-reported elevated cholesterol, dotted lines=undiagnosed elevated cholesterol ≥200mg/dL.

Table 1

Sociodemographics by Gender of the CCHC

	Women	Men	p-value[1]
Sociodemographic			
Age (n (%))			
18-29	208 (20.8)	109 (23.3)	(.897)
30-39	327 (24.4)	153 (22.2)	
40-49	301 (16.8)	152 (17.6)	
50-59	267 (15.5)	115 (14.2)	
60-69	152 (12.7)	83 (12.9)	
70+	88 (9.8)	45 (9.9)	
Marital Status (n (%))			
Single/Never married	226 (19.3)	126 (24.6)	(<.0001)
Married	735 (53.3)	466 (62.0)	
Divorced/Separated	224 (14.4)	76 (9.8)	
Widowed	155 (12.9)	17 (3.6)	
High School Graduate (n (%))			
Yes	525 (41.4)	328 (52.8)	(<.001)
No	818 (58.6)	329 (47.2)	
Household Income (n (%))			
<$10,000	420 (31.4)	139 (19.7)	(<.001)
$10,000-$19,999	325 (22.5)	171 (25.7)	
$20,000+	216 (14.9)	150 (18.9)	
Missing	382 (31.2)	197 (35.6)	
Employment Status (n (%))			
Employed Full-Time	295 (21.4)	356 (49.1)	(<.0001)
Employed Part-Time	245 (17.7)	83 (11.7)	
Unemployed	434 (37.6)	131 (25.0)	
Never Have Worked	229 (15.5)	11 (4.3)	
Other	140 (7.8)	76 (9.9)	
Nativity (n (%))			
US Born	401 (31.9)	259 (44.3)	(<.0001)
Immigrant	921 (68.1)	390 (55.7)	
Insurance Coverage			
Yes	337 (27.7)	234 (36.0)	(<.01)
No	1,006 (72.3)	423 (64.0)	

[1] P-value is based on Chi- Square test.

Table 2

Age and gender-specific self-reported conditions, undiagnosed conditions and biomarkers for the CCHC study[1]

	Total	18-29	30-39	40-49	50-59	60-69	70+
Body Mass Index							
All Obese (BMI ≥ 30)							
Women	717 (51.5)*	80(41.3)	169 (46.0)	173 (58.8)	163 (60.4)	87 (60.2)	45 (49.0)
Men	300 (44.8)	44 (38.3)	88 (57.2)	71 (43.4)	49 (47.1)	30 (36.1)	18 (42.5)
Obese Category III(BMI ≥ 40)							
Women	132 (9.7)**	16 (11.7)	31 (7.7)	32 (10.5)	27 (9.3)	14 (7.5)	12 (13.0)
Men	38 (5.7)	7(6.2)	13 (7.9)	11 (5.6)	4 (4.8)	3 (6.7)	0 (0.0)
Obese Category II (BMI 35-39)							
Women	185 (12.6)*	19 (6.9)	43 (11.2)	53 (19.4)	42 (15.3)	19 (16.7)	9 (6.6)
Men	66 (10.6)	8 (4.9)	29 (21.4)	12 (9.4)	9 (10.6)	4 (4.8)	4 (9.0)
Obese Category I (BMI 30-34)							
Women	394 (28.9)	45 (22.8)	95 (27.1)	86 (28.5)	93(35.4)	52 (34.9)	23 (28.5)
Men	194 (27.9)	29 (27.1)	46 (27.8)	48 (28.5)	35 (30.9)	23 (24.7)	13 (28.9)
Overweight (BMI 25 to 29)							
Women	393 (30.2)***	56 (29.0)	95 (31.1)	93 (29.6)	81 (31.0)	43 (27.9)	25 (33.1)
Men	241 (36.9)	36 (30.3)	42 (32.9)	58 (37.9)	50 (40.8)	42 (54.7)	13 (30.8)
Normal/ Underweight (BMI < 25)							
Women	230 (18.2)	72 (29.7)	63 (22.9)	35 (11.6)	23 (8.6)	21 (11.7)	16 (16.7)
Men	109(17.9)	28 (31.4)	22 (9.0)	23 (18.7)	15 (11.8)	9 (8.2)	12 (25.3)
Diabetes							
Diagnosed Diabetes (n (%))							
Women	194 (13.3)	6 (3.3)	16 (3.9)	36 (11.1)	54 (19.4)	51 (31.5)	31 (28.6)
Men	100 (14.1)	3 (2.0)	8 (7.0)	20 (11.2)	31 (26.2)	30 (36.6)	8 (16.7)
Undiagnosed Diabetes (n (%))							
Women	44 (2.4)***	4 (1.4)	5 (1.1)	17 (4.9)	14 (4.6)	3 (1.4)	1 (1.5)
Men	40 (6.2)	3 (3.1)	4 (4.0)	14 (8.7)	13 (12.3)	5 (7.7)	1 (3.1)
Total Diabetes (n (%))							
Women	239 (15.8)*	10 (4.7)	21 (5.0)	54 (16.3)	68 (24.0)	54 (32.9)	32 (30.1)
Men	141 (20.4)	6 (5.2)	11 (9.9)	35 (20.5)	45 (40.3)	35 (44.3)	9 (19.8)

	Total	18-29	30-39	40-49	50-59	60-69	70+
Blood Pressure							
Self-Reported Hypertension (n (%))							
Women	356 (26.2)*	8 (4.2)	27 (7.8)	68 (22.4)	102 (37.7)	88 (59.2)	63 (63.8)
Men	149 (20.1)	6 (4.1)	14 (6.3)	22 (12.1)	45 (35.8)	42 (53.7)	20 (36.1)
Systolic BP > 140 no SR							
Hypertension (n(%))							
Women	61 (6.7)	0 (.00)	2 (.37)	16 (6.3)	24 (17.6)	15 (26.3)	4 (27.9)
Men	25 (4.5)	1(.73)	3 (.77)	2 (2.6)	9 (12.2)	6(15.2)	4 (13.5)
Cholesterol							
Self-Reported High Cholesterol (n (%))							
Women	316 (22.5)	12 (7.1)	30 (10.4)	65 (21.2)	101 (34.8)	67 (43.3)	41 (40.5)
Men	173 (24.7)	7 (6.7)	28 (19.4)	40 (21.0)	49 (44.1)	35 (48.4)	14 (26.9)
Serum cholesterol ≥ 200 (n(%))[2]							
Women	460 (32.9)**	30(14.7)	76 (19.9)	115 (38.0)	136 (49.4)	69 (49.9)	34 (46.1)
Men	264 (36.9)	23(18.5)	69 (43.2)	75 (50.5)	52 (47.0)	32 (39.5)	13 (22.8)
HDL ≥ 60 (n (%))							
Women	212 (14.3)***	30(13.2)	46 (11.9)	37 (12.8)	52 (19.2)	31 (15.4)	16 (15.7)
Men	45 (4.3)	4(6.2)	8 (4.0)	12 (6.5)	11 (8.4)	7 (12.4)	3 (4.3)
LDL ≥ 130 (n (%))							
Women	306 (22.6)**	22 (12.2)	59 (15.8)	75 (25.7)	86 (32.2)	42 (32.1)	22 (30.1)
Men	176 (26.1)	15(13.6)	49 (35.0)	51 (33.4)	31 (32.6)	21 (25.1)	9 (16.7)

[1] * $p<.05$, ** $p<.01$, *** $p<.001$

[2] Serum Cholesterol ≥ 200 for entire sample regardless of self-report status.

Table 3

Odds ratios from logistic regression for outcomes with significant bivariate relationships with gender for the CCHC study.

Variable	Model1	Model 2: Age and gender interaction model^					
		18-29	30-39	40-49	50-59	60-69	70+
Body Mass Index							
40+	0.57** (0.38, 0.81)	0.70 (0.22, 2.21)	0.82 (0.25, 2.66)	0.65 (0.20, 2.12)	0.54 (0.15, 2.01)	0.44 (0.08, 2.38)	0.00#
35-39	0.82 (0.57, 1.19)	0.69 (0.27, 1.76)	**3.33** (1.54, 7.18)**	1.27 (0.51, 3.17)	1.35 (0.43, 4.26)	0.86 (0.24, 3.15)	1.10 (0.39, 3.05)
30-34	0.95 (0.74, 1.23)	1.23 (0.63, 2.42)	1.19 (0.63, 2.26)	1.17 (0.60, 2.31)	1.18 (0.59, (2.36)	0.81 (0.41, 1.57)	1.28 (0.48, 3.41)
25-29	1.35* (1.04, 1.75)	0.98 (0.52, 1.83)	1.00 (0.51, 1.95)	1.20 (0.65, 2.21)	1.52 (0.81, 2.83)	**2.78** (1.35, 5.74)**	1.20 (0.44, 3.26)
24 or less	0.98 (0.68, 1.40)	1.07 (0.52, 2.21)	**0.35** (0.16, 0.76)**	0.76 (0.33, 1.77)	0.52 (0.24, 1.13)	0.44 (0.18, 1.05)	1.61 (0.62, 4.15)
Self-reported hypertension	0.71* (0.54, 0.93)	1.17 (0.42, 3.25)	1.70 (0.59, 4.90)	**3.09* (1.22, 7.79)**	**10.41*** (4.51, 24.02)**	**15.08*** (6.81, 33.37)**	**5.50*** (2.41, 12.51)**
Undiagnosed diabetes	2.65*** (1.59, 4.43)	2.47 (0.51, 12.06)	3.45 (0.58, 20.50)	**8.86** (2.00, 39.30)**	**11.84*** (2.72, 51.48)**	**8.22* (1.62, 41.84)**	2.04 (0.26, 15.97)
Total diabetes	1.37* (1.04, 1.79)	1.33 (0.44, 4.01)	**3.37* (1.16, 9.77)**	**6.45*** (2.72, 15.28)**	**13.14*** (5.40, 31.95)**	**11.69*** (4.79, 28.56)**	2.57 (0.71, 9.30)
Serum cholesterol ≥ 200	1.35* (1.02, 1.78)	1.20 (0.54, 2.70)	**4.01*** (2.08, 7.72)**	**6.31*** (3.23, 12.32)**	**5.12*** (2.73, 9.73)**	**4.50*** (1.93, 10.47)**	1.98 (0.68, 5.82)
HDL ≥ 60	0.43*** (0.26, 0.71)	**0.09*** (0.02, 0.38)**	**0.27** (0.11, 0.66)**	0.54 (0.18, 1.64)	0.54 (0.24, 1.20)	0.74 (0.23, 2.42)	0.38 (0.08, 1.81)
LDL ≥ 130	1.21 (0.92, 1.60)	1.15 (0.42, 3.17)	**3.24* (1.32, 7.93)**	**3.37** (1.56, 7.30)**	**2.48* (1.13, 5.42)**	2.14 (0.79, 5.80)	1.34 (0.38, 4.74)

^ The table presents individual interaction coefficients from Model 2. Coefficients in bold indicate significant interaction effects.

Controlling for other covariates: marital status, high school graduate, employment status, immigrant status, and insurance status *p<0.05, **p<0.01, p<0.001

Zero cell frequency