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Factors Associated with Trying to Lose Weight in Women with Coronary Heart Disease: Do Factors Differ by Race/Ethnicity?

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Abstract

Background: Guidelines in women with coronary heart disease (CHD) or myocardial infarction (MI) include achieving a healthy body mass index (BMI); however, after MI, weight loss on average is minimal. The aim of this research was to identify factors associated with trying to lose weight among white, non-Hispanic (NH), black, NH, and Hispanic/other women with a history of MI or CHD.

Methods: This research used cross-sectional data (n=3,176) from five years of the Behavioral Risk Factor Surveillance System. Multivariable logistic regression models were stratified on race and variables were maintained in a full model to examine independent effects on trying to lose weight.

Results: Mean BMI was 28.5 (standard deviation=6.8). More black, NH (76%) women reported overweight/obese BMI compared to white, NH (62%), or Hispanic/other (64%, p<0.0001) women. With a BMI of overweight, 55% (confidence interval (CI): 49.1, 60.4) of white, NH, 50% (CI: 33.6, 66.0) of black, NH, and 59% (CI: 41.3, 76.7) of Hispanic/other women reported trying to lose weight (p=0.76). Overall, 57% reported no weight loss advice from a clinician. White, NH, black, NH, and Hispanic/other women who received weight loss advice were 5.0 (CI: 3.3, 7.4), 5.9 (2.3, 14.7), and 7.8 (CI: 3.5, 17.5) times more likely to report trying to lose weight compared to women without weight loss advice.

Conclusions: The majority of overweight/obese women reported no clinician advice to lose weight. This is problematic as weight loss advice was the strongest predictor of trying to lose weight and weight loss is important to reducing risk for secondary event.

Keywords: Weight loss; Coronary heart disease; Myocardial infarction, Body mass index

Introduction

Trends in the prevalence of overweight and obesity that have resulted in the current obesity epidemic in the general population are also observed in individuals with coronary heart disease (CHD) [1]. The prevalence of overweight and obesity in those with myocardial infarction (MI) increased from 58% between 1979 and 1983 to 72% between 1994 and 1998, and remains high today at approximately 75% [2]. Guidelines for individuals with any CHD and after MI include achieving a healthy body mass index (BMI), as weight loss is associated with improved cardiovascular, diabetes, and quality of life outcomes [3-10]. Yet on average, weight remains unchanged after MI [11-13].

Barriers to weight loss after MI include depression, lack of health insurance, and smoking cessation while predictors of weight loss include increasing age, Hispanic ethnicity, higher income, diabetes and hypertension, and desire to lose weight [14-17]. In the general population, black race may be a barrier as nearly three times as many healthy black women who are overweight or obese report no desired weight loss compared to white women [18]. In adults with cardiovascular disease (CVD), physician diagnosis of overweight is a predictor of both weight loss attempt and weight loss success but not all adults with MI are diagnosed as overweight [15]. In otherwise healthy obese adults, females are more likely to receive weight loss advice from a physician and this advice is associated with trying to lose weight [19]. However, the importance of weight loss advice from a physician to females with CHD is not known.

Knowledge of the predictors of successful weight loss in obese adults with CVD is incomplete [15]. Furthermore, there is limited understanding of factors related to trying to lose weight in adults with CHD and even less known about race/ethnicity specific barriers and

motivators among females with CHD. The aim of this research was to identify factors associated with trying to lose weight among white, non-Hispanic (NH), black, NH, and Hispanic/other women with a history of MI or CHD.

Materials and Methods

Cross-sectional data from five years (1999 to 2003) of the Behavioral Risk Factor Surveillance System (BRFSS) were used to examine factors associated with trying to lose weight in a multiethnic sample of women with a history of MI or CHD [20]. The BRFSS is a telephone-administered survey designed to monitor health conditions and behaviors of American adults. BRFSS is supported by the Centers for Disease Control and Prevention and is administered annually by the 50-state health departments and those of the District of Columbia, Puerto Rico, Guam and the U.S. Virgin Islands. The study protocol was reviewed by the Kent State University Institutional Review Board and deemed exempt due to the unidentifiable nature of the data.

Study population

The 1999 to 2003 BRFSS (n=1,069,596) were the most recent data

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to include questions on MI, angina or CHD, trying to lose weight, and ideal body weight. The sample included all females who responded yes to either of the following questions: *has a doctor, nurse, or other health professional ever told you that you had any of the following: "a heart attack, also called a myocardial infarction," or "angina or coronary heart disease."* Response categories included: yes, no, don't know/not sure, and refused. Those who responded no, don't know/not sure, or refused to both the MI (n=359,823) and the angina/CHD (n=360,216) questions were

excluded from analyses. Respondents were also excluded if they were <30 years (n=80,439), >80 years (n=19,887), were pregnant (n=9,051), or reported an underweight BMI (n=168). The remaining respondents were excluded from analysis if they were missing data or reported don't know/not sure or refused on: BMI (n=32,749); race (n=3,269); trying to lose weight (n=238,821); and ideal BMI (n=255,149); or any covariates of interest. The final sample size was 3,176 with complete data on the outcome and all covariates of interest.

	Total N (%)	White, NH (n=2,411) n(%)	Black, NH (n=341) n(%)	Hispanic/Other (n=424) n(%)	p-value
Trying to lose weight	1541(47.4)	1170(45.7)	167(51.0)	204(54.0)	0.12
Mean BMI (SD)	28.53(6.8)	28.12(6.5)	31.67(7.9)	28.42(6.9)	<0.000
BMI categories					
Normal	1103(36.5)	876(38.5)	74(24.5)	153(36.0)	<0.0001
Overweight	1017(29.5)	791(29.7)	90(25.8)	136(31.9)	
Obese	1056(34.0)	744(31.9)	177(49.7)	135(32.1)	
Reported ideal BMI					
Underweight	151(4.1)	127(5.6)	12(3.0)	12(2.4)	<0.0001
Normal	2148(68.9)	1701(71.2)	171(52.1)	276(70.5)	
Overweight	688(20.0)	479(19.5)	103(23.8)	106(19.9)	
Obese	189(7.0)	104(4.8)	55(21.1)	30(7.1)	
Reported ideal weight					
Maintain	906(31.6)	694(32.8)	105(30.1)	107(25.7)	0.67
Gain	626(17.5)	458(17.5)	67(17.6)	101(17.4)	
Loss of (lbs.)					
1-15	369(11.3)	302(11.3)	21(8.6)	46(13.4)	
16-30	448(13.8)	341(13.7)	40(11.8)	67(16.1%)	
31-50	396(13.2)	298(12.5)	41(16.0)	57(14.9)	
51 and over	431(12.7)	318(12.2)	67(15.9)	46(12.4)	
Advice from clinician					
Yes, lose weight	858(28.6)	572(25.1)	143(44.8)	143(35.1)	<0.0001
Yes, gain weight	47(0.94)	36(0.84)	8(2.2)	3(0.39)	
Yes, maintain current weight	128(3.7)	86(3.7)	14(2.7)	28(5.0)	
No	2143(66.7)	1717(70.4)	176(50.4)	250(59.5)	
Diabetes (yes)	909(26.8)	640(25.0)	135(34.6)	134(30.9)	0.04
Hypertension (yes)	2199(68.1)	1628(67.4)	283(83.1)	288(58.4)	<0.0001
Depression (yes)	626(20.0)	460(20.2)	71(18.8)	95(19.9)	0.93
Smoking status					
Never	1422(44.9)	1027(42.1)	164(51.3)	231(56.7)	<0.01
Former	1040(32.6)	836(34.9)	97(25.0)	107(25.9)	
Current	714(22.5)	548(23.1)	80(23.7)	86(17.4)	
Health status					
Excellent/very good/good	1292(42.2)	1051(44.8)	107(32.1)	134(35.7)	<0.01
Fair and poor	1884(57.8)	1360(55.2)	234(67.9)	290(64.3)	
Current age (years)					
30-40	146(5.6)	98(4.9)	23(9.1)	25(6.6)	<0.0001
41-50	386(15.6)	263(13.4)	50(16.4)	73(28.0)	
51-60	706(21.5)	501(19.3)	103(29.3)	102(27.1)	
61-70	935(27.2)	701(28.3)	103(25.2)	131(22.6)	
71-80	922(30.2)	777(34.1)	57(20.1)	88(15.8)	
Marital status					
Divorced, widowed, separated, never married	1322(52.3)	1059(55.1)	95(37.1)	178(49.2)	<0.001
Married or member of unmarried couple	1844(47.7)	1352(44.9)	246(62.9)	246(50.8)	
Education					
Less than or high school	1934(61.8)	1452(61.9)	222(68.1)	260(55.4)	0.01
Some college	816(24.3)	643(25.6)	101(16.7)	101(23.6)	
College or more	426(13.8)	316(12.4)	63(15.2)	63(21.1)	
Employment status					
Not employed	1148(36.0)	775(31.7)	145(46.1)	228(53.3)	<0.0001
Employed	836(27.2)	649(27.4)	91(26.1)	96(22.9)	
Retired	1192(36.8)	987(40.9)	105(27.8)	100(19.8)	
Annual household income					
Less than \$50,000	2798(85.6)	2084(84.2)	314(89.1)	400(91.0)	0.07
\$50,000 or more	378(14.4)	327(15.8)	27(11.0)	24(9.0)	

NH=non-Hispanic; BMI=body mass index; SD=standard deviation; lbs.=pounds

Table 1: Frequency and weighted prevalence of characteristics of women with self-reported myocardial infarction or coronary heart disease stratified by race in the 1999 to 2003 Behavioral Risk Factor Surveillance System, N=3,176.

	White, NH (n=2,411)		Black, NH (n=341)		Hispanic /Other* (n=424)		p-value
	%	95% CI	%	95% CI	%	95% CI	
Trying to lose weight	45.7	42.5-48.9	51.0	43.1-58.9	54.0	45.7-62.4	0.12
Body Mass Index							
Normal	21.7	17.4-26.0	25.2	7.7-42.8	30.2	16.3-44.0	0.44
Overweight	54.7	49.1-60.4	49.8	33.6-66.0	59.0	41.3-76.7	0.76
Obese	66.4	60.5-72.3	64.3	53.8-74.9	75.9	66.5-85.3	0.33
Reported ideal BMI							
Underweight	24.3	12.4-36.3	46.2	35.1-57.3	61.3	17.1-100	0.05
Normal	44.9	41.1-48.6	54.9	43.3-66.5	51.8	41.0-62.6	0.16
Overweight	56.7	49.1-64.4	61.3	49.7-72.9	64.0	48.6-79.5	0.61
Obese	34.5	21.5-47.5	30.5	16.8-44.2	45.4	19.1-71.6	0.65
Reported ideal weight							
Loss of (lbs.)							
1-15	82.6	77.0-88.2	90.9	71.8-100	87.0	73.5-100	0.67
16-30	89.4	84.8-94.0	100	100-100	96.1	91.9-100	-
31-50	98.0	95.5-99.9	100	100-100	98.7	96.3-100	-
51 and over	97.3	95.1-99.5	97.1	91.3-100	97.6	92.7-100	0.99
Advice from clinician							
Yes, lose weight	81.5	76.5-86.4	75.0	64.6-85.5	86.6	81.2-91.9	0.20
Yes, gain weight	7.2	0.99-16.6	0	0	0	0	
Yes, maintain current weight	35.1	17.8-52.5	56.8	33.0-80.5	16.6	0.6-32.6	0.11
No	34.0	30.6-37.5	31.5	19.4-43.6	38.4	27.4-49.3	0.67
Diabetes							
Yes	56.6	50.4-62.8	54.0	39.1-68.9	48.3	28.9-67.6	0.62
No	42.1	38.4-45.8	49.4	40.0-58.8	56.6	47.8-65.6	0.01
Hypertension							
Yes	48.0	44.0-52.0	49.3	40.9-57.8	60.6	51.9-69.4	0.06
No	41.1	35.8-46.4	59.2	39.0-79.3	44.8	29.5-60.1	0.24
Depression							
Yes	49.3	42.0-56.5	32.7	16.4-49.0	39.4	27.7-51.0	0.15
No	44.5	40.9-48.0	55.3	46.8-63.8	57.2	47.6-66.8	<0.01
Smoking status							
Never	46.4	41.4-51.2	58.4	48.6-68.2	56.2	46.6-65.9	0.05
Former	49.7	44.1-55.3	51.9	32.3-71.6	55.8	35.4-76.2	0.83
Current	38.6	32.2-45.1	34.1	22.8-45.3	44.3	26.6-62.0	0.68
Health status							
Excellent/very good/good	46.4	41.5-51.3	57.9	44.3-71.5	62.2	48.3-76.1	0.052
Fair and poor	45.2	40.9-49.4	47.7	38.1-57.4	49.5	38.7-60.3	0.69
Age							
30-40	56.7	43.0-70.4	76.8	55.6-98.0	68.3	39.4-97.2	0.30
41-50	56.4	46.9-65.9	40.0	23.5-56.4	54.6	33.5-75.7	0.48
51-60	53.7	47.2-60.2	53.1	40.1-66.1	63.0	47.5-78.5	0.53
61-70	50.2	44.2-56.3	53.2	37.8-68.8	49.2	37.8-60.6	0.91
71-80	33.7	28.3-39.1	44.1	24.4-63.7	41.2	23.7-58.8	0.43
Marital status							
Divorced, widowed, separated, never married	48.2	43.6-52.7	44.9	30.3-59.5	59.8	49.5-70.1	0.15
Married and member of unmarried couple	42.8	38.4-47.2	54.6	45.2-64.0	48.4	36.1-60.8	0.11
Education							
Less than or high school	44.1	40.0-48.2	51.4	40.9-61.9	55.1	45.2-64.9	0.09
Some college	48.7	42.2-55.2	50.8	38.5-63.1	46.7	30.8-62.7	0.96
college or more	47.6	39.4-55.9	49.6	31.2-68.0	59.6	42.3-76.8	0.48
Employment status							
Not employed	45.8	40.6-50.9	47.2	35.7-58.7	48.2	36.2-60.2	0.92
Employed	54.0	47.7-60.4	57.5	44.4-70.5	61.0	44.1-78.0	0.67
Retired	40.2	35.0-45.3	51.3	33.5-69.0	60.2	49.5-70.9	0.03
Annual household income							
Less than \$50,000	44.2	40.7-47.7	53.0	44.8-61.3	51.2	42.5-59.9	0.09
\$50,000 or more	53.7	46.1-61.4	34.5	12.7-56.4	82.8	61.1-100	0.03

Table 2: Weighted proportions and 95% confidence interval of women with self-reported myocardial infarction or coronary heart disease by race and selected characteristics in the 1999 to 2003 Behavioral Risk Factor Surveillance System, N=3,176

Outcome variable and covariates

The outcome variable “trying to lose weight,” was derived from the question: “are you now trying to lose weight (yes/no)?” Variables examined in analysis included: Current weight (continuous); current BMI (normal; overweight; obese) calculated from current self-reported weight and height; reported ideal weight (maintain; gain; loss of: 1-15, 16-30, 31-50, \geq 51 pounds); reported ideal BMI (underweight; normal; overweight; obese) calculated from reported ideal weight and self-reported height; clinician advice to lose weight (yes, lose weight; yes, gain weight/maintain weight; no); diabetes (yes/no); high blood pressure (yes/no); depression (yes/no); smoking status (never; former; current); health status (excellent; very good; good; fair; poor), age (continuous); marital status (divorced; widowed; separated; never married; or married; member of unmarried couple); education (less than or high school; some college; college or more); employment status (not employed; employed; retired); and annual household income (<\$50,000; \geq 50,000). Race was categorized as white, NH, black, NH, and Hispanic/other (other included Asian Americans, Pacific Islanders, Native Americans and Alaska Natives). For overweight and obese women, clinician advice to lose weight (for women who reported being told by a clinician to lose weight or who were given no advice) and reported ideal BMI were stratified by race to examine the impact that removal of normal weight women had on weight loss advice. Methods for trying to lose weight (i.e., eating fewer calories or less fat and using physical activity or exercise) were described for women who responded “yes” to one of the following questions: *are you now “trying to lose weight” or “trying to maintain current weight.”*

Statistical analysis

BRFSS survey weights that account for the complex sample design were applied using SAS 9.2 software [21]. Weighted sample proportions and 95% confidence intervals (CI) reflecting missing or refused data were obtained and presented overall and by race for each covariate and the outcome. Multivariable logistic regression models were stratified on race and all variables were maintained in a full model to examine their independent effects on trying to lose weight. Overall and race-specific weighted frequencies and 95% CI were calculated for the variables “clinician advice to lose weight” and “reported ideal BMI” for women who were overweight and obese and “eating fewer calories or less fat” or “using physical activity” for women who reported trying to lose or maintain weight.

Results

Of 3,176 women in the study, 76% were white, NH, 11% were black, NH, and 13% were Hispanic/other. Overall, the mean age was 61 (standard deviation (SD)=0.38) years and mean weight was 168 (SD=1.1) lbs (Table 1). White, NH women were more likely to be older (63 (SD=0.42) years) than black, NH (57 (SD=1.1) years) and Hispanic/other women (56 (SD=0.89) years) ($p<0.0001$). There was a significant difference in self-reported weight by race with black, NH women (183 (SD=3.5) lbs.) reporting higher weight than white, NH (166 (SD=1.3) lbs.) or Hispanic/other women (167 (SD=2.3) lbs) ($p<0.0001$). Mean BMI was 28.5 (SD=6.8) with 37%, 30%, and 34% of women reporting height and weight that placed them in the normal, overweight, or obese BMI categories, respectively. More black, NH (76%) women reported overweight/obese BMI compared to white, NH (62%), or Hispanic/other (64%; $p<0.0001$) women. Reported ideal BMI placed 4% of women in the underweight, 69% in the normal, 20% in the overweight, and 7% in the obese BMI categories. Within each race, the majority of women reported ideal BMI that placed them in the normal BMI

category: 71%, 52%, and 71% of white, NH, black, NH, and Hispanic/other women, respectively. Overall, 67% of women reported that their clinician has not provided them with advice about weight loss while 29% reported that their clinician has instructed them to lose weight. Stratified by race, 61%, 43%, and 47% of white, NH, black, NH, and Hispanic/other women reported no clinician provided weight loss advice ($p<0.001$). Other differences in characteristics of women by race were that a higher proportion of black, NH reported diabetes (35%) and hypertension (83%); and a higher proportion of black, NH (68%) and Hispanic/other (64%) women reported fair and poor health status than white, NH (55%) women ($p<0.01$). No differences were observed between races in depression.

Trying to lose weight

Overall, 47% of women reported trying to lose weight with no differences observed between races ($p=0.12$) (Table 1). In women who had a current BMI of overweight (Table 2), 55% (CI: 49.1, 60.4) of white, NH, 50% (CI: 33.6, 66.0) of black, NH, and 59% (CI: 41.3, 76.7) of Hispanic/other women reported trying to lose weight ($p=0.76$). In women who had a current BMI of obese, 66% (CI: 60.5, 72.3) of white, NH, 64% (CI: 53.8, 74.9) of black, NH, and 76% (CI: 66.5, 85.3) of Hispanic/other women reported trying to lose weight ($p=0.76$). In women who reported an ideal BMI that was normal, 22% (CI: 17.4, 26.0) of white, NH, 25% (CI: 7.7, 42.8) of black, NH, and 30% (CI: 16.3, 44.0) of Hispanic/other women reported trying to lose weight ($p=0.33$). When a specific amount of weight loss was identified, more than 80% of women in each race reported trying to lose weight. When a clinician advised a woman to lose weight, 81% (CI: 76.5, 86.4) of white, NH, and 75% (CI: 64.6, 85.5) of black, NH, and 87% (CI: 81.2, 91.9) of Hispanic/other women reported trying to lose weight ($p=0.20$). When a clinician did not provide weight loss advice, 34% (CI: 30.6, 37.5), 32% (CI: 19.4, 43.7), and 38% (CI: 27.4, 49.3) of white, NH, black, NH, and Hispanic/other women reported trying to lose weight ($p=0.67$). The majority of white, NH (57%, CI: 50.4, 62.8) and black, NH (54%, CI: 39.1, 68.9) women with diabetes reported trying to lose while only 48% (CI: 28.9, 67.6) of Hispanic/other women with diabetes reported trying to lose weight ($p=0.62$). Less than half of white, NH and black, NH and 61% (CI: 51.9, 69.4) of Hispanic women with hypertension reported trying to lose weight ($p=0.06$). Less than half of all women in each race reported trying to lose weight if they reported depression ($p=0.15$). Differences between races in trying to lose weight were observed for women without diabetes, retired women, women with income over \$50,000, and women without depression.

Current body mass index

In multivariable analysis, current BMI was predictive of trying to lose weight for overweight white, NH and Hispanic/other women (odds ratio (OR)=3.5; CI: 2.5, 4.9 and OR=3.7; CI: 1.4, 10.3, respectively) and for obese white, NH, black, NH, and Hispanic/other women (OR=4.1; CI: 2.8, 6.0; OR=3.6, CI: 1.3, 9.7; and OR=3.3, CI: 1.1, 9.4, respectively) (Table 3).

Clinician advice to lose weight, ideal body mass index, and weight loss methods

Advice from a clinician to lose weight was the strongest predictor of trying to lose weight for each race with white, NH, black, NH, and Hispanic/other being 5.0 (CI: 3.3, 7.4), 5.9 (2.3, 14.7), and 7.8 (CI: 3.5, 17.5) times more likely to report trying to lose weight when compared to women who did not receive weight loss advice from their clinician when controlling for all other covariates (Table 3).

	White, NH (n= 2,411)		Black, NH (n=341)		Hispanic/Other* (n=424)	
	OR**	95%CI	OR**	95%CI	OR**	95%CI
Current BMI						
Normal	Reference		Reference		Reference	
Overweight	3.48	2.45-4.94	2.66	0.74-9.54	3.74	1.35-10.32
Obese	4.07	2.75-6.03	3.58	1.32-9.70	3.25	1.13-9.39
Advice from clinician						
Yes, lose weight	4.95	3.33-7.37	5.85	2.33-14.67	7.82	3.48-17.54
Yes, gain or maintain weight	1.04	0.50-2.16	0.98	0.29-3.22	0.33	0.10-1.05
No	Reference		Reference		Reference	
Diabetes						
Yes	1.31	0.94-1.82	1.00	0.49-2.06	0.37	0.12-1.09
No	Reference		Reference		Reference	
Hypertension						
Yes	1.21	0.88-1.66	0.49	0.15-1.57	0.35	0.15-0.83
No	Reference		Reference		Reference	
Depression						
Yes	0.93	0.65-1.33	0.39	0.17-0.89	1.59	0.65-3.86
No	Reference		Reference		Reference	
Smoking status						
Never	Reference		Reference		Reference	
Former	1.34	0.97-1.87	1.16	0.49-2.72	1.24	0.52-2.97
Current	0.64	0.42-0.96	0.53	0.21-1.33	1.17	0.32-4.22
Health status						
Excellent	Reference		Reference		Reference	
Fair and poor	0.71	0.52-0.97	0.43	0.19-0.99	0.63	0.25-1.62
Age	0.97	0.95-0.99	0.98	0.93-1.03	0.96	0.92-0.99
Marital status						
Divorced, widowed, separated, never married	0.95	0.70-1.31	1.85	0.77-4.43	0.82	0.37-1.82
Married and member of unmarried couple	Reference		Reference		Reference	
Education						
Less than or high school	Reference		Reference		Reference	
Some college or more	1.04	0.77-1.40	0.80	0.34-1.89	0.41	0.17-0.99
Employment status						
Not employed	Reference		Reference		Reference	
Employed	1.31	0.89-1.93	1.22	0.50-2.99	1.25	0.40-3.89
Retired	1.21	0.81-1.82	1.31	0.45-3.82	2.32	0.86-6.26
Annual household income						
Less than \$50,000	Reference		Reference		Reference	
\$50,000 or more	0.99	0.64-1.54	0.61	0.15-2.51	3.73	0.60-23.19

NH=non-Hispanic; OR=odds ratio; CI=confidence interval; BMI=body mass index
 *Includes Asian Americans, Pacific Islanders, Native Americans and Alaska Natives
 **Odds ratio adjusted for all the covariates shown
 **All variables maintained in a full model regardless of significance

Table 3: Adjusted weighted prevalence odds ratios and 95% confidence intervals for trying to lose weight among women with self-reported myocardial infarction or coronary heart disease in the 1999 to 2003 Behavioral Risk Factor Surveillance System, N=3,176.

In stratified univariate analysis of women who were overweight or obese (Table 4), 57% overall reported no advice to lose weight with 61% of white, NH, 43% of black, NH, and 47% of Hispanic/other women reporting no weight loss advice ($p < 0.001$). The majority (56%) of women who were overweight reported an ideal weight that placed them in the normal BMI. Only 40% of black, NH women reported an ideal BMI that placed them in the normal weight BMI (40%). There were no differences between races in reporting trying to lose weight by eating fewer calories (89%) or in exercising to lose weight (56%).

Other factors

There were no differences in trying to lose weight when stratified by race for women who reported diabetes or by employment status or income (Table 3). Hispanic/other women with hypertension were 65%

(CI: 0.15, 0.83) less likely to report trying to lose weight compared to Hispanic/other women without hypertension. Black, NH women with depression were 61% (CI: 0.17, 0.89) less likely to report trying to lose weight when compared to those without depression. White, NH women who were current smokers were 36% (CI: 0.42, 0.96) less likely to report trying to lose weight compared to white, NH never smokers. White, NH and black, NH women in fair or poor health were 29% (CI: 0.52, 0.97) and 57% (CI: 0.19, 0.99), respectively less likely to report trying to lose weight compared to those in excellent, very good, or good health. With increasing age, white, NH and Hispanic/other women were 3% and 4% less likely to report trying to lose weight for each year increase in age. Hispanic/other women with some college education were 59% (CI: 0.17, 0.99) less likely to report trying to lose weight compared to those with high school education or less.

	Total	White, NH	Black, NH	Hispanic/other**	p-value
	N (%)	n (%)	n (%)	n (%)	
Ideal BMI*	(N=2,073)	n=1,535	n=267	n=271	
Underweight	59 (2.2%)	44 (2.0%)	8 (2.7%)	7 (2.6%)	<0.001
Normal	1162 (56.5%)	925 (59.8%)	104 (39.5%)	133 (56.1%)	
Overweight	679 (31.4%)	474 (31.5%)	101 (31.3%)	104 (30.7%)	
Obese	173 (9.9%)	92 (6.7%)	54 (26.6%)	27 (10.5%)	
Advice from clinician	(N=1,993)	n=1,478	n=256	n=259	
Yes, lose weight	791(42.9%)	526(38.6%)	136(56.6%)	129(53.2%)	<0.001
No	1202(61.1%)	952(61.4%)	120(43.4%)	130(46.8%)	
Weight loss method	(N=1,541)	(n=1170)	(n=167)	(n=204)	
Eating fewer calories or less fat to lose weight	1367 (89.4%)	1036 (88.6%)	151 (90.3%)	180 (93.0%)	0.38
Using physical activity or exercise to lose weight	861 (56.1%)	664 (57.5%)	82 (45.7%)	115 (58.1%)	0.15

BMI=body mass index; NH=non-Hispanic
 *Ideal BMI calculated from reported ideal weight for the individual's body and self-reported height
 **Includes Asian Americans, Pacific Islanders, Native Americans and Alaska Natives

Table 4: Weighted proportions of ideal BMI and clinician's advice on weight loss in overweight or obese women and behavioral methods used in trying to lose weight in women who report trying to lose weight.

Discussion

The main findings of this research in women with MI or CHD were that when a clinician advised weight loss, women in each race were at least five times more likely to report trying to lose weight compared to women who reported no clinician advice to lose weight. As such, clinician advice to lose weight was the strongest motivational factor for trying to lose weight. The other observed motivational factor was current weight, presented in this research as BMI category. Reporting current weight that placed a woman in the overweight or obese BMI category was strongly associated with trying to lose weight in all race/ethnicities; except for overweight black-NH women the association did not reach statistical significance.

Perhaps as interesting as the observed motivational factors were the factors that were not motivational or that acted as barriers including the comorbid conditions of hypertension, diabetes, and depression, and health status and age. Hypertension was only significantly associated with trying to lose weight in Hispanic/other women who were 65% less likely to report trying to lose weight if they reported hypertension. Diabetes was not significant for any race, although for Hispanic/other women the association was nearly the same (OR=0.37; CI: 0.12, 1.1) as for hypertension. Research has shown depression acts as a barrier to weight loss however, only black, NH women with depression were less likely (OR=0.39; CI: 0.17, 0.89) to report trying to lose weight compared to those who were not depressed. While depressed, white, NH women were slightly less likely, Hispanic/other women were more likely to report trying to lose weight; however, these relationships were not significant. Health status, as research has reported in obese adults [19-21], was found to be a barrier as women of each race/ethnicity were less likely to report that they were trying to lose weight if their health was fair to poor, although this was not significant in Hispanic/other women. With increasing age, women were less likely to report that they were trying to lose weight; however, this was not significant in black, NH women.

Given the strength of the relationship between clinician advice to lose weight and trying to lose weight, it is problematic that overall, 57% of overweight or obese women reported no clinician advice to lose weight. Weighted proportions of overweight/obese BMI and advice to lose weight varied between races with 76%, 64%, and 62% of black, NH, Hispanic/other, and white, NH women classified as overweight/obese and 57%, 53%, and 39% of women in these races, respectively reporting advice to lose weight. While the direction of the

proportions corresponded within race (i.e., black, NH reported both the highest prevalence of overweight/obesity and clinician advice) these figures are too low provided the importance of weight loss advice, the recommendation that health care providers give weight loss advice to overweight and obese adults, and the health implications that overweight/obesity has in CHD [22]. In fact, when controlling for all other factors, clinician advice is the strongest predictor of trying to lose weight for each race and it is strongest in Hispanic/other women (OR=7.8; CI: 3.5, 17.5). Research has shown that Hispanics with CVD are 2.6 (CI: 1.3, 5.2) times more likely to report success at weight loss compared to whites and in the current research, the highest proportion of women trying to lose weight were the Hispanic/other women overall and within each BMI category [15]. It is encouraging that overweight/obese black, NH women, who had the highest mean BMI also report the highest prevalence of advice to lose weight and a strong association between clinician advice and trying to lose weight. The limited provision of advice to lose weight is similar to findings in the general population [16] where approximately 75% of overweight and 50% of obese women report no advice to lose weight [18,19,23]. The reasons for the limited advice, especially in the CHD population are not clear; however, research has shown that those who are more likely to report being advised to lose weight are adults who are overweight/obese, adults who are female, middle aged, and who have higher education [16,19,23]. In individuals with a BMI of 25 to 27, only 6% of those with no comorbid condition and 14% of those with at least one comorbid condition were instructed to lose weight [16]. In males and females with CVD, those more likely to be told they were overweight had diabetes, hypertension, and increasing BMI; however, these relationships were not examined in multivariable modeling and being told you are overweight may not be the same as being told to lose weight [15].

The limited attention to issues of excess body weight in the CHD population has been demonstrated in the literature. Evidence is observed in the high prevalence of overweight/obesity and low prevalence of clinician advice in the current research and in research showing that not all adults with MI are told they are overweight, documentation of excess weight in the medical chart after an MI is low, anthropometric measures are only calculated in a small percentage of individuals, and direction to control or lose weight is rarely listed as part of a treatment plan [15,24,25]. Additionally, research on cardiac rehabilitation programs, behavior modification and exercise programs for individuals who have had a cardiac event or procedure, has shown that only 61% of programs set a weight loss goal for participants and that

22% of programs do not record an anthropometric measure [25]. This is problematic when approximately 50 to 60% of cardiac rehabilitation participants have metabolic syndrome and the majority are overweight or obese [7,26-28].

Current BMI was a strong predictor of trying to lose weight with slight variation between races in strength of association and significance. Research has shown that 90% of obese adults with CVD know they are overweight and report wanting to lose weight but only half report trying to lose weight [15]. In the current research, 64 to 76% of obese women reported trying to lose weight, slightly higher than previous report. Consistent with these findings were that the majority of overweight/obese white, NH (60%) and Hispanic/other (56%) women reported ideal BMI that placed them in the normal BMI while only 40% of black, NH women reported an ideal normal BMI while 31% and 27% reported an ideal BMI placing them in the overweight and obese BMI. This is not surprising as black, NH women in the general population who are overweight or obese report no desired weight change compared to white, NH women. Black, NH females (youth and adults) report less body weight dissatisfaction and have a higher current body weight and a higher ideal weight compared to white, NH females [29-32]. Some studies suggest that black, NH women perceive a heavier body weight as more attractive, experience less social pressure regarding weight, and that nearly two-thirds of black, NH women who are at high risk for CVD, do not perceived themselves to be at risk; thus, there may be less motivation in this population to lose weight [33-37]. This higher acceptable BMI or desired BMI is not ideal when black, NH adults have worse CHD mortality compared to other racial/ethnic groups [38,39].

The high proportion of overweight or obesity that varies by race in the current research is not surprising as it is known that racial/ethnic differences exist in BMI, and that weight loss after an MI or with CHD is minimal, and healthy behaviors diminish over time after cardiac rehabilitation [11-15,40,41]. Failure to lose weight is problematic as weight loss is associated with improved insulin sensitivity, lipid profile, exercise capacity, and blood pressure, and reduced risk for diabetes [3-9]. Although research has shown that being overweight or obese at the time of the MI is associated with lower immediate risk for mortality, it ultimately results in higher risk for recurrent MI compared to normal BMI, and mortality due to CHD [42]. Furthermore, as the overweight and obese MI patient tends to be younger and have less CHD compared to the MI patient with normal BMI [2] the modification of weight after MI can have meaningful impact on disease progression and quality and quantity of life years as these overweight and obese women age.

Lifestyle interventions in women with CHD are important to assist with weight loss and improvement in cardiac function and prevention of diabetes. Exercise and calorie restriction that results in minimal weight reduction is shown to reduce the risk of metabolic syndrome and diabetes, and improve lipid profile [43,44]. The proportion of overweight and obese women in this research who were trying to lose weight and who reported eating calorie restriction was 89% with no differences when stratified by race. Unfortunately, the proportion of women who were trying to lose weight and who reported using physical activity to do so was too low with only 56% overall and 46% of black, NH women reporting physical activity to lose weight. Given that this is a sample of women with CHD, these proportions reporting exercise will ideally be closer to 100% provided our knowledge of the benefits of exercise.

Limitations of this research include: The self-reported nature of the data; that women may have had weight change after their diagnosis that was not able to be identified; and that trying to lose weight may not

lead to weight loss. Unfortunately, while motivational factors such as clinician advice and current weight are associated with trying to lose weight, their relationship with actual weight loss in males and females with CVD has not been shown to be significant [15]. This research was not able to examine these relationships in women with CHD; however, given the high proportions of overweight and obesity in the research, it may be inferred that these women were not successful at meaningful weight loss. Strengths of this research include that this is the first research examining factors associated with trying to lose weight in a nationally representative, multiethnic sample of women with CHD and that the impact of clinician advice was found to be strongly associated with trying to lose weight in all women regardless of race/ethnicity.

Conclusions

Assistance with trying to lose weight is important to reduce the complications associated with failure to lose weight after a CHD diagnosis or event. Clinician advice is strongly associated with trying to lose weight in all women regardless of race/ethnicity. Future research will ideally examine in a nationally representative sample the latest prevalence rates of clinician advice to lose weight and the impact of advice to lose weight on actual weight loss in women with CHD of varying race/ethnicity.

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