Research Article

Does physical health differ by weight status in older adult females with coronary heart disease (CHD)?

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Abstract

Purpose: With limited research addressing physical health and weight status in demographic groups with chronic illness, the purpose of this study is to assess the relationship between physical health and weight status for females ages 55 to 79 with coronary heart disease (CHD).

Methods: This study is a cross-sectional analysis using data from the 2016 Behavioral Risk Factor Surveillance System (BRFSS) for N=817 females ages 55-79 years with CHD from the states of Alabama, Georgia, Kentucky, Louisiana and Oklahoma. Ordered logistic regression with combined state data was used to examine the relationship between physical health and weight status, while controlling for health-related, demographic, and socioeconomic factors and state.

Results: About two-thirds of participants reported low (43%) or moderate (25%) physical health and about three-fourths reported obese (47%) or overweight (31%) status. The results of adjusted analysis showed an inverse relationship between each successive level of physical health and weight status. In addition, physical health was strongly related to the number of health conditions and moderately related to mental health, physical activity, and tobacco use.

Conclusion: Physical health status in elderly females with CHD was moderately related to weight status. Clinicians in cardiovascular clinics may expect two-thirds or more of patients in this target population to report low to physical health and overweight to obese status, and that these are moderately related. In addition, physical health was highly related to multiple health conditions and moderately related to mental health, physical activity, and tobacco use. Thus, providers should screen for all of these factors if elderly females with CHD present with any, assess and coordinate treatment plans for comorbid conditions, and recommend weight loss, ways to mental health, options for increasing physical activity, and smoking cessation to better physical health in women ages 55-79.

Introduction

The health of the American population has been declining with each decade, and the number of those reporting good health is steadily decreasing as well [1]. Quality of life (QOL) is a self-reported combined measure of an individual's physical, mental, social, and economic status [2-6] that is highly related to physical, psychological, and societal health and welfare [6-7].

Studies have shown that various factors are related to higher QOL, including health behaviors, demographic variables, and socioeconomic factors. For health behaviors, healthier diet, increased physical activity, adequate amount of sleep, and decreased tobacco use are related to increased QOL scores [3,6,8,9]. In addition, improved QOL is associated with physical activity in the general adult population, chronically diseased, and cancer patients [2]. For demographic variables, it has been observed that older age groups, females, and minority populations report lower QOL than the rest of the population [1,2,5-7]. Related to socioeconomic variables, individuals from lower socioeconomic (SES) classes have an increased risk of chronic health conditions, poor health, and higher mortality rates [10].

Obesity, a chronic health condition, is another public health concern with over one billion people overweight or obese globally [10,11]. Obesity is a combination of genetic, metabolic, social, behavioral, and cultural factors [5]. The disease is associated with detrimental illnesses, comorbidities, and increased mortality and morbidity [3,4,10-12]. Previous studies have found obesity is comorbid with coronary heart disease (CHD), stroke, atrial fibrillation, peripheral artery disease, diabetes, chronic obstructive pulmonary disease

(COPD), hypertension, and chronic renal disease [3,5,8,11-13]. Higher obesity rates are associated with women, older adult populations, and populations within urban areas [8,10,11]. High BMI is related to physical constraints and mobility problems [13].

In general populations, obesity has been associated with lower QOL [3,4]. However, there is limited research for relations between BMI and QOL in demographic groups with chronic illness. The purpose of this study is to assess whether weight status is related to physical health for older adult females with CHD.

Methods

Design

This cross-sectional analysis used data from the 2016 Behavioral Risk Factor Surveillance System conducted by the Center for Disease Control and Prevention (CDC) [14]. The objective of BRFSS is to amass data related to chronic health conditions, health-related risk factors, and use of preventative services from all 50 states, the District of Columbia,

Guam, and Puerto Rico. BRFSS data is collected through administering annual standardized nationwide health-related telephone surveys within the non-institutionalized adult population using random digit dialing techniques. The CDC compiles all BRFSS data and makes de-identified data available to researchers for secondary data analysis. This study was given exempt status by Institutional Review Board of The University of North Texas Health Science Center.

Sample

The sample includes N=817 females ages 55-79 in Alabama (N=137), Georgia (N=101), Kentucky (N=282), Louisiana (N=156), and Oklahoma (N=141) who had data for coronary heart disease (CHD), physical health, and weight status. These states were chosen for their higher prevalence of heart disease when comparing all U.S. states using the BRFSS 2016 data [15].

Data

The outcome, physical health, was originally measured in BRFFS by asking participants, "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good," and then categorizing responses as "low" (0 days), "moderate" (1-13 days), or "high" (14 or more days) levels of poor physical health in the last 30 days. We reversed this variable to measure levels of good physical health as "low" (0-16 days), "moderate" (17-29 days), or "high" (30 days). The factor of interest, weight status, was originally categorized in BRFFS as "underweight" (BMI less than 18.5), "normal" (BMI 18.5 to 25), "overweight" (BMI 25 to 30), or "obese" (BMI 30 or more). Because of small n's, those who reported underweight were dropped from our sample. We used categories for "normal," "overweight," and "obese."

Control variables included number of health conditions, mental health, physical activity, tobacco use, age category, ethnicity/race, education level, employment status, and state. The number of health conditions was calculated based on the number of "yes" responses for the diagnosis of the following conditions: CHD, heart attack, stroke, skin cancer, cancer, COPD, arthritis, depression, kidney disease, diabetes, or asthma. This number was then categorized as "CHD only," "CHD plus 1 other," or "CHD plus 2 or more others." Mental health in BRFSS was categorized as "low" (0 days), "moderate" (1-13 days), or "high" (14 or more days) levels of "poor" mental health relating to "stress, depression, or poor mood" in the last 30 days. We reversed this variable to measure levels of "low" (0-16 days), "moderate" (17-29 days), or "high" (30 days) levels of "good" mental health. Physical activity was measured as "yes" or "no" to whether participants performed physical activity or exercise other than their regular job in the past 30 days. Tobacco use was dichotomized as "yes" or "no" to current smoker. Age was categorized into groups of "55 to 64" and "65 to 79." Because the majority of participants reported white race, ethnicity/race was categorized as "white, non-Hispanic" or "other." Education level was measured as "yes" or "no" to graduated college or technical school. Employment status was measured as "retired" versus "not retired."

Analysis

Frequency distributions by state were used to assess distributions of variables. The samples were combined for descriptive and adjusted analysis because of the low n's within variable categories within states. Ordered logistic regression analysis was used to assess the relationship between physical health and weight status while controlling health-related, demographic, and socioeconomic factors and state. An ordered

logistic regression model is used to estimate a relationship between an ordinal dependent variable and a set of independent variables. The proportional odds produced for each IV relates "proportionally" or equally applies to comparisons of DV groups greater than k versus those who are in groups less than or equal to k, where k is any level of the response variable. Therefore, the interpretation of an associated OR is that for a one unit change in the predictor variable, the odds for a group that is greater than k versus less than or equal to k are the proportional odds times larger. Any observations with missing data for any variables were excluded from the adjusted analysis. Sample characteristics and the results for multivariable analysis are listed in Table 1. All analyses were conducted in STATA 15 (version 15.1, Copyright 1985-2017, StataCorp LLC).

Results

Descriptive Statistics

Table 1 lists participant characteristics for elderly females ages 55-79 with CHD. For physical health (not shown), roughly one-third reported low (43%), moderate (25%) or high (32%) levels of physical health in the last 30 days. For weight status, most reported either overweight (31%) or obese (47%). For health-related factors, most participants had CHD and two or more other health conditions (84%); over half reported high mental health (56%); about half reported performing physical activity in the last 30 days (51%); and most were not current

Table 1. Descriptive statistics and adjusted results

Predicting Good Physical Health (low vs. moderate vs. high)	N	%	AOR	95% CI Low	95% CI High
Weight Status	817	100			
Normal	180	22	ref	-	-
Overweight	250	31	**0.67**	0.44	0.98
Obese	387	47	**0.53**	0.36	0.77
Number of Health Conditions	773	100			
CHD only	30	4	ref	-	-
CHD + 1 other	93	12	**0.32**	0.11	0.93
CHD + 2 or more other	650	84	**0.14**	0.05	0.38
Mental Health	814	100			
Low	178	22	ref	-	-
Moderate	184	23	**3.55**	2.23	5.68
High	452	56	**5.48**	3.56	8.45
Physical Activity	815	100			
No	396	49	ref	-	-
Yes	419	51	**1.63**	1.21	2.18
Tobacco Use	796	100			
Nonsmoker	652	82	ref	-	-
Current smoker	144	18	**0.65**	0.44	0.97
Age Category	817	100			
55-64	263	32	ref	-	-
65-79	554	68	1.08	0.76	1.53
Ethnicity/race	811	100			
Other	187	23	ref	-	-
White, non-Hispanic	624	73	1.11	0.79	1.56
Education Level	817	100			
Did not graduate college/technical school	435	53	ref	-	-
Graduated college/technical school	382	47	1.03	0.78	1.39
Employment Status	815	100			
Not retired	425	52	ref	-	-
Retired	390	48	1.11	0.80	1.53

Note. AOR: Adjusted Odds Ratio, 95% CI: 95% Confidence Intervals, ref: Referent Group, boldface indicates significance (AORs with 95% CI that do not include 1.00 are significant).

smokers (82%). For demographic factors, most of participants were 65-79 years old (68%) and the majority of participants reported being white (73%). For socioeconomic factors, almost half of the participants reported graduating from either college or technical school (47%) and being retired (48%).

Adjusted Statistics

As shown in Table 1, the results of ordered logistic regression analysis with combined state data for females ages 55-79 with CHD indicated that after controlling for all other variables in the model, weight status was significantly related to physical health. Compared to normal weight status, those who reported overweight were about 1.5 times less likely to report each successive level of physical health, and those who reported obese were about 2 times less likely to report each successive level of physical health. In addition, physical health was related to mental health status, physical activity, number of health conditions, and tobacco use. Compared to those who reported low mental health, those who reported moderate mental health were about 3.5 times more likely to report each successive level of physical health; and those who reported high mental health were about 5.5 times more likely each successive level of physical health. In addition, compared to those who reported no physical activity, those who reported physical activity in the past 30 days were about 1.5 times more likely to report each successive level of physical health. In contrast, compared to those who reported only CHD, those who reported CHD plus one other health condition were about 3 times less likely to report each successive level of physical health, and those who reported CHD plus two or more other health conditions were about 7 times less likely to report each successive level of physical health. Also, smokers were about 1.5 times less likely to report each successive level of physical health than nonsmokers.

Discussion

The purpose of this study was to assess the relationship between physical health and weight status for females ages 55 to 79 with coronary heart disease (CHD), and to our knowledge, this is the first study to do so. Adjusted results showed that weight status was moderately related to physical health in older adult females with CHD. Those who were overweight were about 1.5 times less likely, and those who were obese were about 2 times less likely, to report each successive level of physical health. These results are consistent with other research that showed an increased BMI was associated with lower quality of life in general populations [3,4].

In addition, the results of this study indicated that participants with higher levels of mental health were about 3.5 to 5.5 times more likely to report each successive level of physical health and participants who reported CHD plus other health conditions were about 3 to 7 times less likely to report each successive level of physical health. These results are similar to prior research [16]. In addition, those who performed physical activity were about 1.5 times more likely to report each successive level of physical health, while current smokers were about 1.5 times less likely to report each successive level of physical health. These results are also consistent with findings in multiple other studies [2,3,6,8,9]. Thus, the findings in this study suggest that physical health in elderly females with CHD may be related to the severity and successful management of multiple comorbidities.

Limitations

A major strength of this study is the large, multi-state sample obtained from the BRFFS 2016 data. However, we did not have information for the severity or management of reported chronic conditions or mental health issues. Future studies should include these as it could help clinicians better understand how the relationship between obesity and physical health could be complicated by these factors. In addition, our study showed that physical activity was significantly related to physical health; however, it did not examine different frequencies or intensities of physical activity. Future studies should include these as it could help providers determine different types of activities that could fit into different lifestyles.

Recommendations

The results of this population-based study may generalize to older adult females with CHD in a cardiovascular clinic setting. For this target population, clinicians may expect three-fourths or more of their patients to report low to moderate physical health and overweight to obese weight status, and that these are moderately related. Thus, providers should always screen for both; educate patients on the importance of annual screenings and preventive measures and the benefits of weight loss; and provide referrals to specialists as needed. In addition, providers may expect a high prevalence elderly females with CHD to have multiple health conditions and that multiple health conditions is highly related to physical health. Thus, providers should screen for both if patients present with either; assess and coordinate treatment plans for comorbidities; determine patient compliance with treatment; and refer to specialists as needed. Furthermore, about half of patients in this target population may report low to moderate levels of mental health and no physical activity in the last 30 days, and up to one-fifth to use tobacco. Since physical health shows moderate relations with these, providers should screen for all of these factors if older adult females with CHD present with any. Health care providers should educate patients on the importance of mental health, physical activity, and smoking cessation; suggest changes that fit into the patient's lifestyle and financial situation; and provide resources for smoking cessation and referrals to psychiatry or physical therapy as needed.

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