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Care of Patients with or At-Risk for Cardiovascular Disease

The cardiovascular health status of minority female nursing assistants working in long-term care: A pilot study

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ABSTRACT

Objective: To describe the cardiovascular disease (CVD) status of nursing assistants (NAs) working in long-term care.
Background: Most research with NAs focus on work-related outcomes despite NAs' potentially high risk for CVD.
Methods: Baseline data from a pilot physical activity (PA) and diet focused health promotion study were used to describe NAs CVD risk. Objective (blood pressure, lipid panel, PA levels, body mass index) and subjective (depressive symptoms) data from 39 NAs were used to provide a CVD assessment.
Results: Twenty-nine (76.3%) participants had at least three CVD risk factors. Specifically, 18% of participants were hypertensive, 89% of participants were overweight/obese, 90% of participants had hyperlipidemia and 97% of participants did not meet PA guidelines.
Conclusion: The data suggest NAs working in long-term care have multiple CVD risk factors. Future research should consider PA and diet focused worksite health promotion (WHP) interventions to decrease their CVD risks.

Introduction

Currently 37% of the United States has cardiovascular disease (CVD) and based on known health behaviors of Americans, 41% of the US population is projected to have CVD by 2030. This increase in CVD is expected to cause total costs of cardiovascular medical care to triple in the next 20 years, increasing from $237 billion to $818 billion annually. Indirect cost related to CVD is also anticipated to increase by 61%, rising to $276 billion by 2030.[1] Numerous factors influence CVD. Some CVD risk factors are non-modifiable, such as age, gender, family history and genetics while others are modifiable such as lack of physical activity (PA), tobacco use, poor dietary intake,[1] as well as managing stress and depression.[2] Depressive symptoms have been noted to directly contribute to CVD through physiologic changes, such as cardiac rhythm disturbances, hypercoagulability, and inflammation.[2] In addition, depressive symptoms are believed to indirectly influence CVD due to the impact of mood on behavior. For example, those that are depressed may overeat and eat foods that are not heart healthy such as chocolate and fried foods[3–7] and may be less likely to engage in regular exercise.[6–8]

Prior research with minority women shows 76% do not engage in regular physical activity (PA), 91% exceed the recommended amount of daily sodium intake, 60% exceed the recommended daily fat intake, and 17% use tobacco products[9] putting them at high risk for CVD. There are approximately 1.5 million nursing assistants (NAs) working in the United States.[10] A majority of NAs are minority women. The mean age of NAs is 41 years. On average, they make $11.54 an hour and many live below the federal poverty line.[11–13] Twenty-six percent of NAs currently employed in nursing care facilities do not have appropriate insurance coverage for health promotion screenings.[14] Most of the published reports providing information about NAs focus on demographic information and work related outcomes[11] whereas, little is known about the current cardiovascular health status of these individuals. However, due to their demographic profile,[13] lack of health care access,[14] and the CVD disparities this population typically faces[15,16] NAs are anticipated to be at high risk for CVD.

Therefore, the purpose of this study was to assess the CVD risks and cardiovascular health of NAs working in long-term care using a subjective assessment of depressive symptoms as well as objective assessments of blood pressure (BP), body mass index (BMI), lipid, and PA levels. We also aimed to explore the association between the three most common CVD risk factors (BMI, BP, and total cholesterol)[17] to assess if this population has the same cluster of common

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CVD risk factors as the general population. We hypothesized that NAs' BMI, BP and total cholesterol will be moderately correlated. Understanding the CVD of this group of health care workers will provide information that can be used to guide future research.

Methods

Design

This was a descriptive study using baseline data from the Worksite Heart Health Improvement Project (WHHIP). The WHHIP was an experimental six-month pilot worksite health promotion study. Two long-term care facilities were randomized to receive the WHHIP intervention or education only control. Briefly, the WHHIP incorporated behavior change interventions to impact PA and diet with the goal of reducing NAs CVD risk. Participants were exposed to CVD prevention education as well as active engagement in healthy eating and PA. All study assessments and interventions occurred during paid work time. Participants were then followed for an additional three-months to assess initial maintenance. As described elsewhere,[18–20] NAs were invited to participate in the study through the use of flyers and discussions at staff meetings. In addition, "meet and greet" sessions were held and research staff were available to answer questions about the project.

Sample

Nursing assistants were eligible to participate if they were female, were a member of a minority group, worked at the study facility at least two days a week, were at least 18 years of age and could read and write English. Participants were ineligible if they self-reported they were pregnant or if they did not pass the *Exercise Assessment and Screening for You*.[21,22] The EASY screening tool includes six questions that reflect possible concerns associated with cardiovascular or musculoskeletal risks associated with exercise such as recent chest pain, dizziness, or pain associated with ambulation. If a respondent answered affirmatively to a question in which further evaluation suggested it was not safe for the NA to engage in PA she was excluded from the study. After meeting eligibility criteria, participants consented to partake in the project, which was approved by a University Institutional Review Board. Of the 99 available NAs from both facilities, 54 (55%) expressed interest in the study, 8 refused, 7 were ineligible and 39 (39%) NAs consented to be in the study. The reasons for ineligibility were male ($n = 3$), not currently employed at the facility as an NA ($n = 3$) and worked less than two days a week ($n = 1$).

Measures

Data collection was done via a paper and pencil survey completed by the participants during their workday. The survey assessed depressive symptoms as well as demographic information (e.g., age, race, medication usage) and work characteristics (e.g., shift worked, job tenure). In addition, objective data such as height, weight, PA levels, BP, and lipid panel were collected.

Depressive symptoms were subjectively measured using the 10-item Center for Epidemiologic Studies Depression Scale (CES-D). Scores were summed and reverse coding was done when appropriate. Scores can range from 0 to 30 and a score $\geq$10 is considered significant presentation of depressive symptoms.[23] Prior use of the CES-D among minority women demonstrated that there is evidence of internal consistency (Cronbach's alpha of .86)[24] and when used with healthy older adults there was evidence of predictive validity.[25] In our sample, the internal consistency of the measure was poor (Cronbach alpha of .49), which we believe was due to our small sample size and the relatively short nature of this 10-item measure.

Physical activity was objectively measured using the Omron® HJ-112 pedometer.[26] Participants were asked to wear the pedometer for seven consecutive days to collect steps, kilocalories, number of aerobic steps and time spent engaging in aerobic activity. Participants were consistently reminded to wear their pedometers and research staff checked pedometers for missing data. If participants returned their pedometer with any days of missing data, they were given one more opportunity to wear the pedometer for seven days.[27] Over the seven days of PA data collection, 14 participants returned their pedometers with at least one day of missing data. On average, these individuals returned their pedometers with 2 days of missing data. When participants were asked why they did not wear their pedometers they most often reported it was because they stayed in bed most of the day recovering from work. In these instances, the data were calculated as zero. From the daily pedometer data, an average score for each individual pedometer variable was created. In addition, daily aerobic minutes were summed to determine if participants engaged in $\geq$150 min of moderate PA or its equivalent a week.[28] Per the Omron® HJ-112 pedometer,[26] aerobic activity was defined as 10 min of consecutive PA at a rate of at least 60 steps per minute. Prior research has demonstrated validity of the Omron® HJ-112 pedometer when compared to treadmill walking in individuals with various BMIs.[29,30]

At rest BP was obtained using the Omron® Hem-711 BP machine,[26] which has been shown to produce results similar to mercury sphygmomanometer.[31] Using a standard protocol seated BP was collected three times and then averaged.[32]

Lipid panel (i.e., total cholesterol, high-density lipoprotein [HDL], low-density lipoprotein [LDL] and triglycerides) was assessed using a CardioChek® machine.[33] Prior research has shown the CardioChek machine is reliable and provides results consistent with those done using traditional lab testing.[34,35] Based on findings[36] noting that lipid testing is only minimally affected by a participants' non-fasting status participants were not required to be fasting for the lipid panel assessment. The CardioChek® machine cannot calculate total cholesterol or triglyceride values above or below the machine's predetermined extreme value cut point,[33] thus, when this occurred the data were treated as missing. Three participants were noted to have total cholesterol values that were $<$100 mg/dL and 11 participants were out of range with regard to triglyceride levels. One participant had triglycerides over 500 mg/dL and 10 had triglycerides $<$50 mg/dL.

Height and weight were assessed using the facilities' standometer and scale. Participants were asked to remove their shoes and empty their pockets before collecting their weight on the facility's scale. Height and weight were then used to calculate BMI using the Centers for Disease Control and Prevention's formula.[37]

Data analysis

Using baseline data from the WHHIP, descriptive data analysis, correlations, and crosstabs were done with SPSS versions 16 and 17.[38,39] All continuous CVD risk factors were assessed for skewness, with cutoff scores defined as skewness/standard error of skewness $\geq$3.[40] Three variables were noted to be skewed including job tenure, triglycerides and average daily steps and in these situations, median value were reported instead of means. We used Pearson correlations to assess the association between continuous CVD risk factors variables (i.e., systolic BP, BMI, and total cholesterol). In addition, a composite CVD risk factor variable was created by summing individual CVD risk factors based on standard cut points. We included: being overweight/obese based on the Centers for