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Original Research

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ABSTRACT

Background: Heart disease is a leading cause of death in the United States. Proper treatment of patients with cardiovascular disease is essential and can be challenged by non-disclosed use of complementary or alternative treatments. The objective of this study was to assess which demographics were associated with complementary and alternative medicine (CAM) use and if education affects the use of CAM.

Methods: A cross-sectional survey was conducted among a stratified random sample of residents of Southeastern Georgia. Sampling was stratified by urban/rural residence in order to reach sufficient rural residents. Participants that indicated they had been diagnosed with hypertension or heart disease were included in this analysis. Participants also self-reported if they used CAM, their reasons for CAM use, frequency of CAM use, source of knowledge and level of satisfaction with CAM.

Results: Among the 50 respondents with cardiovascular disease, 17 (34%) reported using CAM. The most commonly used type of CAM was vitamins and minerals (used by 26% or participants) followed by massage (19%) and relaxation/breathing (17%). CAM use was not associated with race, education, income, rural residence, smoking or quality of life, controlling for age and sex.

Conclusions: Although there were no associations of socio-demographic characteristics and CAM use, this study highlights the prevalence of CAM use among individuals with heart disease and types of CAM frequently used. These findings should drive future, larger studies to further understand treatment decisions of rural patients with cardiovascular disease.

Keywords: Alternative medicine, homeopathy, heart disease, cardiovascular disease, hypertension
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INTRODUCTION

An estimated 610,000 people die each year from heart disease. In 2011, heart disease was the leading cause of death in the United States (Centre for Disease Control and Prevention, 2015). In people with cardiovascular disease, proper management of medication is critical, and effective medical management can be compromised by the misuse of complementary and alternative medicine (CAM) through interactions with prescription treatments or contraindications (Grant et al, 2012). CAM includes a wide range of products and practices that are not a part of the traditional medical care such as yoga, acupuncture, massage, aromatherapy, hypnosis and chiropractic treatments. CAM use is becoming more wide-spread (National Institute of Complementary Medicine, 2015).

A nationwide government survey analyzed the trends of CAM use between 2002-2012 and showed that about 32-36% of adults in the United States reported using CAM in the past year, with the highest rates among people above 45 years (Clarke et al, 2015). This coincides with the age-group with the highest prevalence of cardiovascular diseases (Centre for Disease Control and Prevention, 2015). The use of complementary and alternative medicine in cardiovascular disease is prevalent. One large study reported 36% of respondents with cardiovascular disease used CAM therapy (excluding prayer) in the past year and about half had used herbal therapies (Yeh, et al 2006). A recent survey on the use of CAM reported showed that the majority of people who use CAM do so without informing their physicians and few physicians are knowledgeable about CAM (Ge et al, 2013). The safety and efficacy of many CAM modalities has not been established and is of special concern for individuals with cardiovascular diseases.

The objective of this study was to assess the prevalence of CAM use, modalities used, and to determine if socio-demographic characteristics, including rurality, are associated with CAM use in a sample of patients with cardiovascular disease in Southeast Georgia, USA.

METHODS

Setting
A cross-sectional survey was conducted among residents of Southeastern Georgia.

Institutional Review Board Approval
The current analysis was reviewed and approved by the authors' Institutional Review Board (Georgia Southern University).

Participants
Participants were selected using the State voter's registration list in a stratified, random manner based on rurality. According to census data, 60-90% of adults in the selected counties are registered voters (United States Census Bureau, 2016). Mailed questionnaires were sent to 940 residents.

Assessments
The questionnaire collected self-reported socio-demographic characteristics (age, sex, race, education, income, and residence); medical conditions including hypertension and heart disease; and use of CAM. Types of CAM used, reasons for CAM use, frequency of CAM use, source of knowledge and level of satisfaction were also assessed. Additionally, participants reported their perceived health status and quality of life using five categories: excellent, very good, good, fair and poor. Only participants that indicated they had been diagnosed by a practitioner with hypertension or heart disease were included in this analysis.

Statistical Analysis
Descriptive statistics were calculated using Chi-square for categorical data to assess the bivariate association of socio-demographic characteristics and CAM use. For continuous data, a t-test or analysis of variance (ANOVA) was used. The general and clinical characteristics of the subjects were summarized using frequencies and percentages for categorical data and means ± standard deviation and median (range) for continuous data.

The adjusted odds ratio (OR) and 95% confidence interval (CI) were assessed using multivariate logistic regression, adjusting for age and gender. Due to the small sample size, several variables were dichotomized prior to regression analysis (race, rural residence, income, education, and quality of life). The statistical significance was set at $p \leq 0.05$, and SAS version 9.4 software was used to conduct analyses.

RESULTS

Among the 144 participants who responded to the survey, 53 participants (37%) had heart disease. Of these, 50 provided complete data and were included in the analyses. The majority of participants did not use CAM (66%). As shown in Table 1, CAM users were of similar age as non-users (mean ± SD for users = 59 ± 9.96 years vs 64 ± 12.61 years for non-users, p=0.32). The majority of the participants in the study were women and there were more female (72.22%) than male (27.78%) CAM users. Race and education did not differ notably between CAM use status. Income was significantly associated with CAM use (p = 0.03) in bivariate analyses, with CAM users tending to have greater income compared to non-users. Only 24% of CAM users lived in rural areas compared to 41% of non-users (p=0.36). As shown in Table 2, there were no significant associations between socio-demographic characteristics and CAM use after adjusting for age and sex.

Table 1: Demographic Characteristics

	CAM Users (N=17)	Non-Users (N=33)	P*
Age (years, mean ± SD)	59.41 ±9.96	64.09 ±12.61	0.32
Sex (%) Men Women Missing=0	27.78% 72.22%	48.48% 51.52%	0.23
Race (%) White Black Hispanic Other Missing=3	83.33% 16.67% 0% 0%	84.38% 12.50% 0% 3.13%	0.81

	CAM Users (N=17)	Non-Users (N=33)	P*
Education (%)			0.36
Doctorate	0%	9.09%	
Master's	27.78%	21.21%	
Bachelor's	33.33%	30.30%	
Some College	33.33%	18.18%	
High School/GED	5.56%	21.21%	
Missing=2			
Income (%)			0.03
<$20,000	0%	9.38%	
$20,000-$34,999	11.76%	21.88%	
$35,000-$49,999	23.53%	21.88%	
$50,000-$74,999	29.41%	9.38%	
$75,000-$99,999	0%	25.00%	
$100,000+	35.29%	12.50%	
Missing=0			
Residence (%)			0.36
Urban/City	11.76%	18.75%	
Suburban	41.18%	18.75%	
Small Town	23.53%	21.88%	
Rural	23.53%	40.63%	
Missing=4			
Quality of life (%)			0.79
Very good	33.33%	27.27%	
Good	44.44%	54.55%	
Neutral	22.22%	18.18%	
Bad	0%	0%	
Missing=0			

Table 2: Associations of sociodemographics with CAM use (N=53)

Variable	OR*	95% CI
Race (white vs other)	0.31	0.03, 3.00
Education (<Bachelor's Degree vs ≥ Bachelors Degree	1.65	0.42, 6.51
Income (<50,000 vs ≥ 50,000)	0.72	0.18, 2.89
Residence (rural vs other)	2.06	0.50, 8.47
Smoke (never smoked vs have smoked)	1.46	0.29, 7.31
QOL (quality of life) (very bad/ fair vs good/very good)	0.62	0.10, 3.89

*All measures are adjusted for age and sex in the table

Figure 1 shows the frequencies for the types of CAM used. The most commonly used type of CAM was vitamins and minerals (used by 26% or participants) followed by massage (19%) and relaxation/breathing (17%). The most common

specific reason for CAM use was, 'trying everything that could help" (67%); "conventional treatments are too mechanistic/technological and lacks human touch" (11%); "want to take control of treatment" (11%); and "CAM is more in keeping with beliefs and inner self" (11%).

Figure 1: Types of CAM Use Among Heart Disease Participants (%)
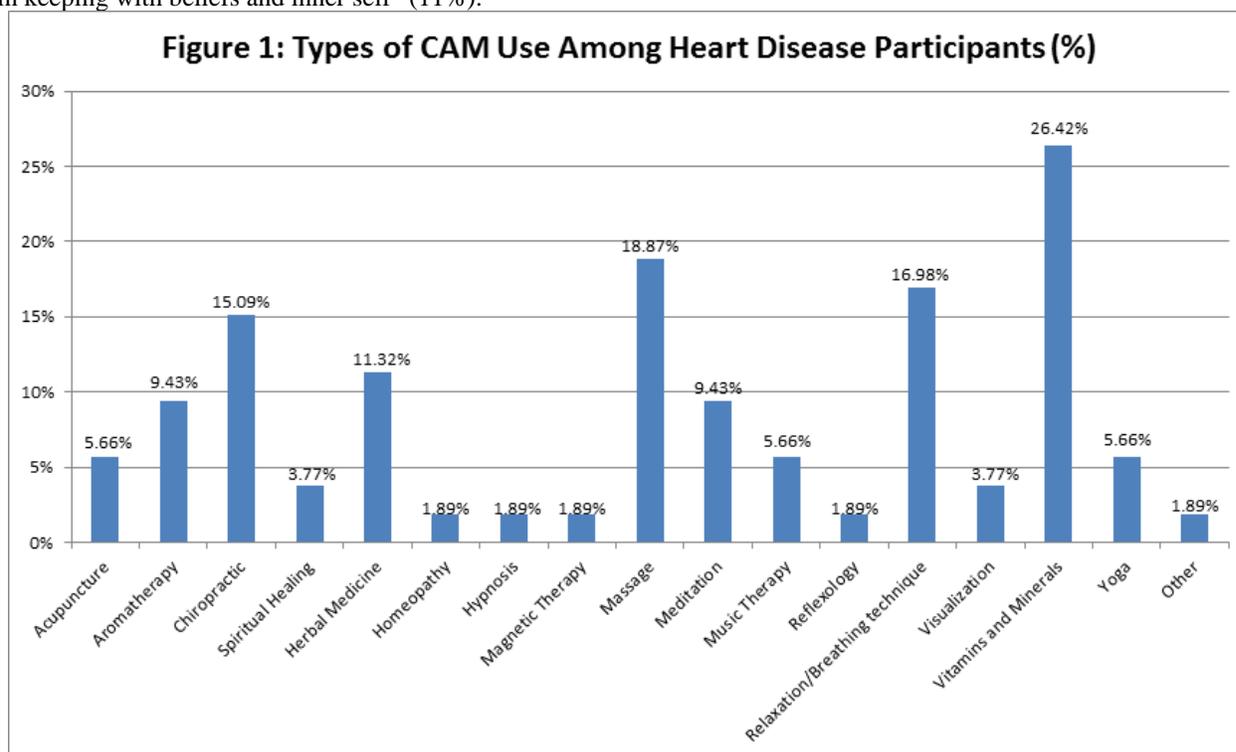
DISCUSSION

This cross-sectional study did not find any socio demographic associations of CAM use among individuals with cardiovascular disease. The majority of participants with heart disease in this study who used CAM were Caucasian. Similar studies have shown that CAM use is more common among white adults than minority population (Grant et al, 2012). We found an association of income with CAM use. These results are consistent with previous studies which showed higher socioeconomic status was associated with higher use of CAM due to the ability to pay for CAM services (Verhoef et al, 2005; Barner et al 2010). About 47% of heart disease patients in our study who used CAM resided in small towns or rural areas of Georgia while 41% lived in the suburban regions and 12% lived in urban areas. This is also comparable to studies done on a national scale (Verhoef et al, 2005) and may be explained by most CAM being passed down from generations and due to the effect of folklore or "old wives' tales".

Despite the use of CAM by one third of participants with heart disease, there are few data on the prevalence and pattern of CAM supplement use among people with heart disease. Similar to our findings, one third of patients diagnosed with cardiovascular diseases (Yeh et al 2006) and chronic heart failure (Zick et al, 2005) reportedly use CAM. In these studies, CAM use was more common among Asians, women, younger respondents and in those with higher socio-economic status. Our results showed similar demographic trends for age, sex, and income, but only

income reached statistical significance. Previous studies have reported the top four complementary treatments used for cardiac symptoms are relaxation techniques, stress management, meditation, and guided imagery (Prasad et al, 2013), similar to our findings. However, a survey in 2002 by NHIS demonstrated that 61% of respondents used biologically based therapies, which included supplements, herbs and special diets as a form of CAM therapy (Yeh et al, 2006). Likewise, a study of patients in a cardiac rehabilitation center reported the majority (67%) were taken some form of herbal/natural supplements, with omega-3 PUFAs being most common (Nieva et al, 2012). Only 11% of participants in our study reported use of herbal supplements, and 26% reported use of vitamins and minerals. These differences may reflect regional differences in the study populations. The American Heart Association has recommended use of Omega-3 fatty acids for the secondary prevention of cardiovascular disease (Kris-Etherton et al, 2002).

A few studies have revealed the effectiveness of CAM on cardiovascular outcomes among youth. For example, a pilot study of 37 students revealed a marked reduction in blood pressure after Hatha Yoga (Sieverdes et al, 2014). Transcendental Meditation has shown a beneficial impact on essential hypertension in high risk youth (Barnes et al, 2001). Another study on pre-hypertensive youths concluded that Breathing Awareness Meditation was advantageous in preventing essential hypertension (Barnes et al, 2008). Similarly, Breathing Awareness Meditation was shown to have an additional benefit on hemodynamics and sodium

and water retention on pre-hypertensive African American Adolescents (Gregoski et al, 2011). Among adults, several studies have examined the effects of meditation and other mindfulness interventions in patients with cardiac disease, but have not reported cardiac-related outcomes. One study reported people with a history of cardiac disease experienced improvement in arterial pulse wave velocity and reduction in antihypertensive medications following 90 days of participation in Ayurveda treatment incorporating diet, yoga, meditation, breathing and herbal supplements (DuBroff et al, 2015). It is important to consider that the safety of most herbal supplements are not tightly regulated by the Food and Drug Administration and as such their safety and efficacy cannot be confirmed.

As the first study to evaluate characteristics of CAM use in individuals with cardiovascular disease in rural Georgia, these data serve as a foundation for further research. This study also provides insight on commonly used CAM therapies and reasons for use which could aid healthcare providers in tailoring treatment plans for their patients. One major limitation of the study was the inability to generalize results due to the small sample size. The response rate from the mailed questionnaires was low (12%). Due to the small sample size, stratification by rurality was not possible, but would have provided further insight on patterns that may be present in rural or urban regions. The low response rate also increases the likelihood of selection bias, as potential participants who were not interested in the topic or who were in poor health would be less likely to respond than healthy, interested individuals. This study is further limited by the reliance on self-reported data, which could present recall bias or reporting of responses considered socially desirable.

For future studies, a larger sample size would increase the power and allow more complete analysis of data, including stratified analysis based on rurality. Other alternatives for completing the survey (such as the option for online completion) could be implemented to increase the number of participants. When mailing surveys to similar populations, providing an incentive could possibly increase the response rate.

CONCLUSIONS

CAM approaches are used in approximately one third of patients with Cardiovascular Disease. The fundamental mechanism for CAM usage, evidence to support effectiveness, pharmacologic effects and long-term benefits on cardiovascular diseases have to be proven. Further understanding of the therapeutic approaches of CAM is necessary to give accurate information on whether particular CAM modalities are safe or beneficial in populations with health concerns. Additionally, physicians and health care workers should be encouraged to be open to communicating about CAM to patients. Additional research is encouraged to increase knowledge of CAM use in individuals with chronic disease living in rural areas.

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