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SOCIOECONOMIC STATUS, ATTITUDES ON USE OF HEALTH INFORMATION, PREVENTIVE BEHAVIORS, AND COMPLEMENTARY AND ALTERNATIVE MEDICAL THERAPIES: USING A U.S. NATIONAL REPRESENTATIVE SAMPLE

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ABSTRACT

Complementary and alternative medicine (CAM) is used commonly in the United States. In this exploratory research, we investigated the associations of CAM use with socio-demographics, health information use, health behavior, and attitudinal variables. Data was analyzed using the U.S. 2007 Health Information National Trends Survey (n=4,760).We compared the characteristics of CAM users and non-users for these variables using a Chi-squared test for independence. A Logistic Regression analysis was used to examine the possible correlates of CAM uses, including socio-demographics, health information use, health knowledge, nutrition intakes, and skin protection behaviors, as well as the attitudes of anxiety and depression. Research showed that CAM users were generally knowledgeable on the subject of genetic testing, preferring to take control of their health by tracking health data. They also believed that healthy behaviors or interventions could positively change their health status. According to the study, CAM users were most likely to be female, elderly, have a higher level of education, live in a metro area, visit health professionals frequently although they perceive themselves to have a low health status, exercise frequently, and are not overweight.

Keywords: complementary and alternative medicine, health information seeking, preventive behavior, nutrition

INTRODUCTION

Complementary and alternative medicine (CAM) continues to play an important role in improving consumers' health. CAM includes a number of therapies outside the domain of mainstream Western medicine that are used for medical intervention, health promotion, or disease prevention (Sawniand Thomas, 2007).The most common complementary therapies include: herbal medicine, relaxation techniques (such as meditation), and physical therapies (such as yoga, massage, and acupuncture) (Barnes *et al.,* 2004).The number of CAM users has been increasing steadily in the United States. In 2002, 62% of America adults employed some form of CAM (Barnes *et al.,* 2004).

In previous studies, one of the major reasons cited by users for increased CAM usage was greater health needs or they could not afford the cost of conventional care (Nahin *et al.,* 2010). Several studies using a national survey indicated that people's use of complementary therapies closely relates to their socio-demographics factors, such as marital status, education levels, family income, race, and living region (Sidora-Arcoleo *et al.,* 2007; Wells *et al.,* 2007; Goldstein *et al.,* 2008; Bishop& Lewith, 2010; Fang *et al.,* 2010; Nahin *et al.,* 2010).Others reported a positive association between CAM use and preventive behaviors (Smith *et al.,* 2008).

The earliest studies of CAM usage in consumer health made informative findings into the socio-economic factors influencing CAM use (Smith *et al.,* 2008). Additional research was needed, however, to understand how the relationship between CAM usage and the users' socio-economic status related to their preventive life styles, nutrition intake, and protective health measures, such as skin care. To explore these relationships, we used a national representative population, the Health Information National Trends Survey 2007 (HINTS), to gain insights into user socio-demographics,

daily diets, and nutrient intakes, as well as preventive behaviors and health information seeking behaviors.

METHODS

Data Collection

The U.S. Health Information National Trends Survey 2007 (HINTS) is a telephone and survey conducted by the U.S. National Cancer Institute to study health information seeking behavior about cancer. CAM use was assessed by using the question "*During the past 12 months, did you use any complementary, alternative, or unconventional therapies such as herbal supplements, acupuncture, chiropractic, homeopathy, meditation, yoga, or Tai Chi?*". Missing data was excluded resulting in the final dataset of 4,760 individuals. Responses were classified as "yes" or "no" with the results weighted to be representative of the U.S. population. Several demographic variables were included for the analysis, such as respondents' age, gender, marital status, education levels, annual family income, race/ethnicity, and region of U.S. residence.

We also included health service-related variables, such as availability of professional healthcare ("During the past 12 months, not counting times you went to an emergency room, how many times did you go to a doctor, nurse, or other health professional to get care for yourself?"), quality of health care ("Overall, how would you rate the quality of health care you received in the last 12 months?"), physical activity factors pertaining to regular exercise ("During the past month, did you participate in any physical activities or exercises such as running, yoga, golf, gardening, or walking for exercise?"), trust of medical information ("how important would it be for you to get your own medical information electronically?"), and genetic testing ("Have you heard or read about any genetic test?").Other attitude variables included anxiety of getting cancer ("How often do you worry about getting cancer?") and beliefs concerning cancer ("Cancer is most often caused by a person's behavior or lifestyle.").

Diet-related and lifestyle variables were also considered in this research. These included: fruits serving (How many servings of fruits and vegetables do you think the average adult should eat each day for good health?"), weight loss ("Have you tried to lose any weight in the past 12 months?"), perceptions of being overweight ("Right now do you feel you are overweight, slightly overweight, underweight, slightly underweight, or just about the right weight for you?"), umbrella usage ("How often do you stay in the shade or under an umbrella?"), hat usage (How often do you wear a hat?"), and sun cream usage ("How many times in the past 12 months have you used sunless tanning creams or sprays, also known as self-tanning or fake tanning"?).

Statistical Analysis

All statistical analysis in this study was conducted by STATA 10.1 software (College Station, Texas, USA) using weighted samples. Descriptive analysis and bivariate statistics (Chi-squared) were calculated to show to characteristics of CAM users and nonusers. Multivariate logistic regression analysis was used to examine the relationships between CAM use and other variables and to identify the predictors for CAM use.

RESULTS

Chi-square analysis found that CAM users tended to be between 50 and 64 years old, female, have a high education level, and have higher incomes (Table 1). In addition, CAM users care a lot about their health. For example, they visit health professionals frequently and have a low self-perceived health status. They also believe health behaviors will be beneficial in preventing disease. In addition, they obtain health knowledge (e.g., awareness of genetic testing) and want to take control of their own medical information electronically. Furthermore, there is a statistical correlation between users who consume more servings of fruits and vegetables, try to lose weight, often wear a hat, and seldom use skin protection and increased CAM use (Table 1).Logistic regression analysis results are presented in Table 2. Using demographic variables as control, predictive factors such as number of servings of fruits and vegetables per day, weight status, skin protection use, umbrella use, attempting to lose weight and wearing a hat were correlated with CAM use.

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Table 1. Chi-Square analysis for the CAM use

Variables	Yes	No	P-Value
Gender			<0.001
Male	32.2%	39.9%	
Female	67.8%	60.1%	
Age			<0.001
18-34	14.0%	14.1%	
35-49	27.1%	23.3%	
50-64	37.4%	33.7%	
65-74	14.3%	15.6%	
75+	7.2%	13.2%	
Race			<0.001
Hispanic	6.5%	8.8%	
White	86.9%	80.0%	
African American	6.6%	11.2%	
Education Level			<0.001
Less than high school	3.1%	8.3%	
High school graduate	18.9%	25.0%	
Some college	31.0%	30.3%	
College graduate	46.9%	36.4%	
Income			<0.001
< $20,000	10.8%	15.3%	
$20,000 to $35,000	12.3%	16.0%	
$35,000 to < $50,000	14.6%	13.3%	
$50,000 to < $75,000	18.9%	18.8%	
$75,000 or more	39.6%	32.0%	
Others (Refused)	3.7%	4.7%	
Marital Status			0.102
Married	37.1%	39.6%	
Others	62.9%	60.4%	
Region			0.345
Metro area> 1 million	50.2%	48.3%	
Metro area> 250,000	19.9%	21.7%	
Metro area< 250,000	12.0%	11.1%	
Non-metro county	17.9%	19.0%	
Number of Visit Health Professional			< 0.001
1 time	13.5%	16.3%	
2 times	17.6%	21.0%	
3 times	15.3%	14.0%	
4 times	13.6%	15.2%	
5-9 times	22.1%	19.4%	
10 or more times	17.9%	14.0%	
Self-Perceived Health Status			< 0.001
Excellent	30.4%	36.4%	
Very good	41.6%	41.6%	
Good	20.2%	16.3%	
Fair	7.8%	5.7%	

Own Medical Information electronically			0.001
Very important	54.1%	48.3%	
Somewhat important	32.2%	36.0%	
Not at all important	13.7%	15.7%	
Heard of Genetic Tests			< 0.001
Yes	41.6%	32.1%	
No	58.4%	67.9%	
Regular Exercises			0.001
Yes	82.5%	69.3%	
No	17.5%	30.7%	
Anxiety of Getting Cancer			0.199
Rarely or never	47.2%	45.5%	
Sometimes	43.1%	43.1%	
Often	9.6%	11.4%	
Cancer is most often caused by a person's behavior or lifestyle			< 0.001
Strongly agree	9.1%	7.0%	
Somewhat agree	42.4%	39.7%	
Somewhat disagree	32.0%	31.3%	
Strongly disagree	16.5%	22.1%	
Number of Servings of Fruits and Vegetables			< 0.001
0-2 time	15.4%	22.7%	
3-4 times	32.8%	39.9%	
5 times or more	51.8%	37.5%	
Lose Weight			< 0.001
Yes	64.8%	57.9%	
No	35.2%	42.1%	
Weight Status			0.353
Overweight	30.7%	32.8%	
Slightly overweight	38.3%	37.6%	
Underweight	0.7%	0.9%	
Slightly underweight	2.4%	2.9%	
Right weight for you	27.9%	25.9%	
Wear Hat			< 0.001
Always	14.7%	17.7%	
Often	19.6%	17.2%	
Sometimes	27.7%	22.1%	
Rarely	18.0%	16.0%	
Never	20.0%	26.9%	
Times of using skin protection			< 0.001
0 times	79.6%	86.5%	
1-2 time	5.9%	4.5%	
3-10 times	7.5%	4.7%	
11-24 times	3.8%	2.3%	
25 times or more	3.3%	2.0%	

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Table 2. Logistic regression analysis of characteristics associated with CAM use

Characteristics	Odds Ratios (95% Cl)
Gender	
Male	1.00
Female	1.45 (1.15, 1.83)*
Age	
18-34	1.00
35-49	1.26 (0.95, 1.67)
50-64	1.26 (0.96, 1.66)
65-74	1.07 (0.78, 1.48)
75+	0.66 (0.45, 0.99)*
Race	
Hispanic	1.00
White	1.34 (0.93, 1.93)
African American	0.84 (0.52, 1.35)
Education Level	
Less than high school	1.00
High school graduate	1.51 (0.91, 2.50)
Some college	1.85 (1.11, 3.08)*
College graduate	1.90 (1.13, 3.17)*
Income	
< $20,000	1.00
$20,000 to $35,000	0.99 (0.66, 1.47)
$35,000 to < $50,000	1.40 (0.95, 2.08)
$50,000 to < $75,000	0.98 (0.67, 1.44)
$75,000 or more	1.07 (0.74, 1.55)
Others (Refused)	0.90 (0.54, 1.49)
Marital Status	
Married	1.00
Others	0.95 (0.77, 1.18)
Region	
Metro area> 1 million	1.00
Metro area> 250,000	0.70 (0.55, 0.87) **
Metro area< 250,000	1.02 (0.74, 1.41)
Non-metro county	0.89 (0.68, 1.16)
Number of Visit for Health Professional	
1 time	1.00
2 times	1.14 (0.83, 1.57)
3 times	1.38 (0.99, 1.93)
4 times	1.41 (0.99, 2.00)
5-9 times	1.63 (1.19, 2.24) **
10 or more times	2.29 (1.65, 3.18) ***
Self-Perceived Health Status	
Excellent	1.00
Very good	1.31 (1.05, 1.62) **
Good	1.79 (1.37, 2.33) ***
Fair	2.62 (1.71, 4.03) ***

Own Medical Information electronically	
Very important	1.00
Somewhat important	0.68 (0.56, 0.83) ***
Not at all important	0.94 (0.70, 1.24)
Heard of Genetic Tests	
Yes	1.00
No	0.76 (0.62, 0.92) **
Regular Exercises	
Yes	1.00
No	0.62 (0.49, 0.79) ***
Anxiety of Getting Cancer	
Rarely or never	1.00
Sometimes	0.83 (0.68, 1.01)
Often	0.73 (0.51, 1.03)
Cancer is most often caused by a person's behavior or lifestyle	
Strongly agree	1.00
Somewhat agree	0.86 (0.59, 1.26)
Somewhat disagree	0.65 (0.44, 0.96) *
Strongly disagree	0.53 (0.36, 0.78) **
Number of Servings of Fruits and Vegetables	
0-2 time	1.00
3-4 times	1.15 (0.88, 1.51)
5 times or more	1.77 (1.35, 2.32) ***
Lose Weight	
Yes	1.00
No	0.78 (0.63, 0.98) *
Weight Status	
Overweight	1.00
Slightly overweight	1.07 (0.86, 1.34)
Underweight	3.74 (1.09, 12.88) *
Slightly underweight	1.19 (0.67, 2.13)
Right weight for you	1.59 (1.21, 2.08) **
Wear Hat	
Always	1.00
Often	0.90 (0.65, 1.26)
Sometimes	1.17 (0.84, 1.63)
Rarely	1.11 (0.77, 1.60)
Never	0.66 (0.47, 0.93) *
Number of using skin protection	
0 times	1.00
1-2 time	1.61 (1.06, 2.43) *
3-10 times	1.22 (0.85, 1.76)
11-24 times	1.48 (0.93, 2.34)
25 times or more	1.70 (0.94, 3.09)

* p<0.05, ** p<0.01, *** p<0.001

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DISCUSSION

In the HINTS study population; approximately 28.9% of respondents used at least one CAM therapy in the past 12 months. Non-Hispanic whites used CAM more frequently than Hispanics and non-Hispanic blacks. This finding was consistent with the report in the 1999 National Health Interview Survey (NHIS) (Ni *et al.,* 2002). In the past few years, researchers examined what factors contributed the most to CAM use and found that people normally believe that nutrition, acceptance in using medical information, weight control, and skin protection were the keys to keep in good health.

Our results indicated that being female; having more years of formal education, higher income status, and being senior are all associated with higher rates of CAM use. These relationships between socio-demographic variables and CAM use were consistent with previous findings (Bair et al., 2002; Owen and Fang, 2003; Barraco *et al.,* 2005; Graham *et al.,* 2005; Burke *et al.,* 2006; Mehta *et al.,* 2007; Bennett *et al.,* 2009; Matsuyama *et al.,* 2011). Our research found that CAM users care a lot for their health. They believe that cancer could be caused by a person's behaviors or lifestyles, so they take an active role in keeping up their health. For example, they exercise regularly (McCaffrey *et al.,* 2004) and visit health professionals frequently. Conversely, they also consistently show a poor self-perceived health status, likely due to their anxiety or worries about their own health conditions (Kessler *et al., 2001*; Al-Windi, 2004; McCaffrey *et al.,* 2004; Goldstein *et al.,* 2005; Upchurch *et al.,* 2007; Wu *et al.,* 2007; Smith *et al.,* 2008; Nelson *et al.,* 2009).

Genetic testing helps users understand their genetic risks for certain diseases, so that people can adapt better or effective health behaviors or life styles for health prevention (Kolor *et al.,* 2008). CAM users obtain sufficient health knowledge and know the benefits of genetic testing for better prevention planning. In addition, they would like to handle their own medical information online so that can monitor their activity profiles for exercises, nutrient intakes, as well as other prevention activities. CAM users like other type of health users will be beneficial from the increasing adaption of Personal Health Records or Electronic Health Record.

Interestingly, weight status plays an important role in a person's behavior. Many people, especially females, believe themselves to be overweight or slightly overweight. In logistic regression analysis, we found that being a female and self-defined overweight were positively related to the CAM use. Knowing their weight status could prompt users to seek out strategies to lose weight which may in turn cause them to evaluate the CAM use.

CAM has been used widely to treat skin disease (Smith *et al.,* 2008).In this study, we found that skin protection behaviors were also related to use of CAM. There is a correlation between females who often wear hats and use more skin protection, such as sunscreen, and active CAM use.

Consumption of fruits and vegetables plays an important role in the health of an individual. The National Cancer Institute (NCI) recommends that people consume five to nine servings of fruits and vegetables in order to decrease their risk of cancer (NCI, 2005). In our findings, the number of servings of fruits and vegetables consumed was significantly correlated to CAM use. Eating fruits and vegetables could improve the immune system, and therefore, it is a convenient preventive approach to lower the risks of getting chronic disease and cancer.

This study has limitations. HINTS are largely restricted to a multiple-choice format with only one question related to CAM use, and there is little information available on different CAM modalities. Despite these limitations, the findings from this study have important implications for CAM users by highlighting CAM users' attitudes on health information management, as well as the health behaviors in nutrition, lifestyle, and skin protections.

CONCLUSIONS

The study revealed the correlates of socioeconomic status, attitudes on use of health information, health preventive Behaviors with complementary and alternative medical therapies in the U.S. Survey results may help better understand the determinants for CAM usage among the U.S. adults. Overall, CAM users were normally female, elderly, with good education, live in a metro area, visit health professionals frequently although they perceive themselves to have a low health status. They are not

overweight, believe in behavior interventions exercise, and have heard of preventive intervention strategies such as genetic testing.

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