

## ORIGINAL RESEARCH

# Examination of the use of complementary and alternative medicine in Central Appalachia, USA

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## ABSTRACT

**Introduction:** A growing number of people in the USA and worldwide use complementary and alternative medicine (CAM). CAM usage has been reported to differ by region. Little is known about the usage of CAM, especially among the Appalachian region population. The aim of this study is to evaluate the usage of CAM among adults in Central Appalachia.

**Methods:** A 23-question survey was distributed to 250 participants seeking free medical care at remote area medical events held in Wise County, Virginia in July 2012 and in Buchanan County, Virginia in October 2012. The questions on the survey addressed various aspects concerning CAM: forms of treatment used, frequency of use, main reasons for using CAM, and where they obtained their CAM therapies. The survey also collected demographic characteristics of the respondents. Subjects were asked to complete a two-page survey while waiting for service.

**Results:** A total of 192 (76.8%) responses were useful and complete. About 56% of the CAM users were female and 55% had an annual gross income of less than \$20,000. About 49% had used CAM therapies in the past, of which 58% used CAM therapies at least once a month. Respondents used CAM because it worked well ( $n=52$ ; 27%), had less side effects ( $n=45$ ; 23%), and was affordable ( $n=43$ ; 22%). CAM therapies were used mainly to address back pain ( $n=23$ ; 15.6%), general health and wellbeing ( $n=22$ ; 14.9%), depression and anxiety ( $n=11$ ; 7.5%), and general pain ( $n=11$ ; 7.5%), among others. Having a primary care provider, current level of education, and gross annual income were significantly associated with CAM use ( $p<0.001$ ). Most respondents ( $n=94$ ; 85%) were comfortable telling their doctor or other medical personnel about their use of CAM therapies.

**Conclusion:** The prevalence of CAM usage among people in the Central Appalachia region was high, and higher than the national average. Most respondents were comfortable sharing their CAM usage information with their healthcare providers. More research is needed to further understand the factors underpinning CAM usage by the Central Appalachia population.

**Key words:** Appalachia, CAM, complementary and alternative medicine, conventional medicine, pharmacy.



## Introduction

Complementary and alternative medicine (CAM) is defined by the National Center for Complementary and Alternative Medicine in the USA as therapies not considered to be part of conventional medicine as practiced by medical doctors, doctors of osteopathy, and allied health professionals<sup>1</sup>. CAM therapies include many diverse practices such as homeopathy, massage, chiropractic, relaxation techniques, and herbal medicine<sup>2</sup>. Alternative medicine is popular throughout the industrialized world<sup>1,3,4</sup>. CAM has become increasingly popular among Americans over the past several decades<sup>1,5</sup>, with a substantial proportion of the general population using CAM<sup>5</sup>. Up to 50–65% of adults in developed countries use some form of CAM for their health-related problems<sup>6,7</sup>. Many Americans use CAM therapies to complement rather than replace mainstream or conventional medicine<sup>5</sup>. The CAM products are used for various conditions and disease states including prostate cancer, diabetes, ulcerative colitis, pain management, inducing labor, and autism spectrum disorders<sup>8-11</sup>.

People seek out and use CAMs for multiple reasons, including (i) ethnic or cultural beliefs (many immigrant communities hold health beliefs and practices that favor CAM use)<sup>12</sup>, (ii) an interest in spiritual or personal growth, (iii) convenience<sup>12</sup>, (iv) availability of conventional medicine<sup>12</sup>, (v) dissatisfaction with the ability of conventional medicine to adequately treat chronic and terminal illnesses<sup>13-15</sup>, and (vi) the need to have greater control of their own health<sup>6</sup>. In addition, many people are worried about the cost of conventional care<sup>16</sup> and many find CAM therapies to be cost-effective<sup>17</sup>. Overall, people use CAM therapies if they believe that these therapies will help to improve their health and wellbeing<sup>18,19</sup>.

A majority of CAM users tend to be female, affluent (eg higher incomes), middle-aged, better educated, white, and of poor health status<sup>5,7,18,20</sup>. Many people with chronic<sup>16</sup> and terminal illnesses such as chronic pain, Alzheimer's

disease, rheumatic diseases, cancer, headaches, anxiety and back pain use CAM therapies more than other patients<sup>13,18,21</sup>. Many Americans pay for CAM therapies out-of-pocket as many CAM therapies are not covered by third-party payers<sup>12</sup> – Americans spent \$33.9 billion out-of-pocket on CAM in 2007<sup>12</sup>.

Notable safety and efficacy issues are associated with CAM use. Unlike conventional medicines, most of the alternative medicines sold over the counter are not heavily regulated by the US Food and Drugs Administration; therefore, their quality may not be consistent from one batch to another. The quality of products can vary significantly from one supplier to another. Few efficacy and safety studies have been conducted on CAM therapies prior to marketing<sup>22,23</sup>.

Some physicians do not endorse CAMs or certain CAMs<sup>3</sup>. CAM therapies, as with any medication, can interact with conventional medications<sup>9</sup> prescribed by healthcare providers, causing them to be sub-therapeutic or supra-therapeutic. This underscores the need for physicians and other healthcare providers to be knowledgeable of the CAM therapies their patients are taking for optimal clinical care. However, many CAM users do not disclose their usage to their healthcare providers<sup>5</sup>.

The prevalence of use of CAMs varies markedly in the USA, most likely due to methodological and regional differences (eg rural vs urban)<sup>7,18</sup>. No known CAM study in the USA has included a predominantly rural population. A typical user of CAM in a rural area may have different characteristics to those reported in the literature. The purpose of this study is to evaluate CAM usage in the Central Appalachia region, a predominantly rural setting. Many Central Appalachia residents do not have access to health care. Reasons for this include lack of specialist services; long distances to access services; limited public transportation; lack of health insurance, cost; and shortage of healthcare professionals<sup>24</sup> and specialist services such as dentistry, mental health services and obstetrics services.



The specific research objectives of the study are to determine:

- the prevalence in CAM usage among the adults in Central Appalachia
- the frequency of use of complementary and alternative medicine of Appalachians
- the main reasons people choose to use CAMs
- the main health problems for which the people used CAM therapies
- people's willingness to share their CAM usage information with their healthcare providers
- the relationship between CAM usage and demographic factors.

## Methods

### Design

The survey was administered in July and October 2012 at two different remote area medical events, in the Wise and Buchanan counties in Central Appalachia.

### Instruments

Data were collected using a two-page survey consisting of 23 items developed for this study. The draft survey was circulated to four pharmacy faculty members to check the validity of the questions on the survey. Minor modifications were made after incorporating the changes suggested. The survey was completely voluntary and informed consent was obtained orally from prospective participants. Each survey began with the statement, 'Completing this survey serves as your informed consent. Your answers cannot be linked to you. It is completely voluntary.' The questions on the survey addressed various aspects concerning CAMs, such as whether patients had utilized CAMs before, frequency of use, the main reasons for using CAMs, and whether CAMs were their primary choice of treatment. Survey items included:

*Q. Please check all forms of treatment you have used before:*  
*herbal/natural products/massage/chiropractic/osteopathic/*

*vitamins/faith healing or minister/acupuncture/other (please specify).*

*Q. What are the main reasons why you choose complementary and alternative medications (choose all that apply): convenience/affordable/availability/works well/safety/less side effects than drugs/easy to use/other.*

The survey also had questions about whether the participants were comfortable in telling their doctors or other medical personnel about their CAM usage, and the importance of these health care professionals knowing of their usage. Eight questions assessed patients' demographic characteristics such as gender, race/ethnicity, year born, insurance coverage, having a primary care provider, place of residence, annual gross income, and highest level of education attained.

### Participants

The study targeted 250 participants who were 18 years or older, not pregnant, and residents of the Appalachian region who were attending free medical care clinics and agreed to participate.

### Procedures

Prospective participants who were waiting for medical services at the remote area medical events in Wise and Buchanan counties were asked by Appalachian College of Pharmacy students if they would be willing to participate in the survey about CAM therapies. Those who agreed to participate in the study completed the survey. The survey took approximately 8 minutes to complete. Appalachian College of Pharmacy students were available to provide assistance in completing the survey. All the completed surveys were collected by the students and forwarded to the primary investigator (first author) upon completion.

### Data analysis

All the data were entered into Microsoft Excel 2010 and then uploaded to PASW Statistics 18 (SPSS Inc.; <http://www->



01.ibm.com/software/analytics/spss) for analysis. The means, standard deviations, and frequency distributions of all variables were computed. Chi-square analysis was used to explore the association between CAM use and gender, having a primary care provider, having health insurance, annual gross income and highest level of education attained. An alpha level of 5% was used for statistical significance ( $p \leq 0.05$ ).

## **Ethics approval**

This cross-sectional descriptive study was approved by the Edward Via College of Osteopathic Medicine Institutional Review Board; approval number 2011/016.

## **Results**

Of the 250 surveys administered, 192 were useful and complete (a 76.8% response rate). Fifty-eight surveys were excluded from analysis because of missing data. Most of the respondents ( $n=108$ ; 56%) were female, had a primary care provider ( $n=116$ ; 61%), did not have medical insurance ( $n=105$ ; 55%) and had annual incomes under \$20,000 ( $n=105$ ; 55%) (Table 1).

### **Prevalence and frequency of CAM usage**

Ninety-four respondents (49%) reported having used CAM therapies in the past. Fifty-eight per cent ( $n=108$ ) of respondents used CAM therapies at least once a month with 61 (33%) respondents reporting using CAM on a daily basis.

Most respondents utilized vitamins ( $n=113$ ; 58.9%), and herbal/natural products which were utilized by 72 respondents (37.5%).

Thirty-seven respondents (34%) reported gathering or picking their CAMs from the land or mountain (Table 2).

### **Main reasons for using CAM**

The top three reasons cited by respondents for CAM use were 'they work well' ( $n=52$ ; 27%), 'they have less side

effects' ( $n=45$ ; 23%), and 'they are affordable' ( $n=43$ ; 22%) (Table 2). Other reasons cited included availability, convenience, ease of use, and safety (Table 2). Most respondents ( $n=103$ ; 56%) said they would recommend CAM therapies to their friends and family (Table 2).

### **Health problems for which CAM was used**

CAM therapies were mostly used for back pain ( $n=23$ ; 15.6%), general health and wellbeing ( $n=22$ ; 14.9%), depression and anxiety ( $n=11$ ; 7.5%), and for general pain ( $n=11$ ; 7.5%) (Table 3). In addition, CAM therapies were used for a host of other problems including arthritis, migraine or headaches, neck pain, energy, fatigue, diabetes, sleep, fibromyalgia, finger numbness, constipation, high blood pressure, cold/allergies, prophylaxis, anemia, nutrition, and weight problems (Table 3).

### **Relationship between CAM usage and demographic factors**

There was no statistically significant association between having medical insurance ( $p=0.31$ ) and gender ( $p=0.15$ ) and CAM usage ( $p>0.05$ ). Having a primary care provider, current level of education, and gross annual income were all significantly associated with CAM use ( $p<0.001$ ).

### **Willingness to share information about CAM usage with healthcare professionals**

Most ( $n=94$ ; 85%) respondents reported that they felt comfortable telling their doctor or other medical personnel about their use of CAM therapies. Asked about the healthcare professionals with whom they were likely to share information about their use of CAM, respondents mentioned doctors ( $n=92$ ; 44.0%), pharmacists ( $n=60$ ; 28.7%) and nurses/nurse practitioners ( $n=53$ ; 25.4%) (Table 4).

A total of 83 respondents (76.2%) considered it important or very important for them to share their CAM use information with their healthcare providers (Table 4).



**Table 1: Respondent demographics**

Characteristic	Frequency (%)
Gender (n=192)	
Female	108 (56.2)
Male	84 (43.8)
Have primary care provider? (n=191)	
Yes	116 (60.7)
No	75 (39.3)
Have medical insurance? (n=191)	
Yes	86 (45.0)
No	105 (55.0)
Level of education (n=192)	
High school/GED test	84 (43.8)
Some college/2-year degree	51 (26.6)
Some high school, not graduate	28 (14.6)
More than college	20 (10.4)
8th grade or less	5 (2.6)
4-year college degree	4 (2.0)
Gross annual income (n=192)	
Less than \$20,000	105 (54.7)
\$20,000–40,000	42 (21.9)
\$40,000–60,000	7 (3.6)
\$60,000–80,000	3 (1.6)
\$80,000–100,000	2 (1.0)
>\$100,000	1 (0.5)
Not disclosed	32 (16.7)

GED, general educational development.

## Discussion

Our research findings showed 49% of the respondents reported using CAM, a figure that is higher than CAM use prevalence reported in the literature. For example, results of a national survey found that 42.1% of the respondents used alternative therapies in 1997<sup>5</sup>. In a separate survey in 1990, about 33.8% of the respondents used alternative therapies<sup>13</sup>. In a random sample of 1035 individuals in the USA, 40% of respondents had used some type of CAM during the previous year<sup>18</sup>. Relative to these, the findings of this study suggest that CAM use in Central Appalachia is high and that more Central Appalachia residents use CAM than the rest of the US population<sup>12</sup>.

The high CAM use in Central Appalachia could be explained by many factors. Central Appalachia residents have limited access to conventional medical care, especially specialist services<sup>24</sup>, and may use CAM therapies in place of conventional medical care. High usage could be explained by access to forests and herbal medicines within them. The Central Appalachia region has heavily wooded areas where CAM products can be grown and collected. The availability of these resources was cited by participants as one of the reasons for their usage of CAMs. The high usage could also be explained by poverty: in 2008, 24% of the Central Appalachian residents were poor<sup>25</sup>. Many residents of Central Appalachia are unemployed with unemployment rates higher than state (Virginia) and national averages<sup>25</sup>. Many of these people often cannot afford the cost of conventional medical care and medicines, and may be inclined to use CAM therapies.



**Table 2: CAM use: frequency, types and reasons**

Survey item	Frequency (%)
Used CAM in the past?	
No	98 (51.0)
Yes	94 (49.0)
Forms of CAM used (n=192)	
Vitamins	113 (31.8)
Herbal/natural products	72 (20.3)
Chiropractic	50 (14.1)
Massage	45 (12.7)
Faith healing/minister	41 (11.5)
Osteopathic	15 (4.2)
Acupuncture	10 (2.8)
Other	9 (2.5)
Frequency of CAM use	
Daily	61 (33.0)
Rarely	47 (25.4)
Never	30 (16.2)
Monthly	26 (14.1)
Weekly	13 (7.0)
Twice a month	8 (4.3)
Gathered/picked medicines from mountain/land in the past? (n=109)	
Yes	37 (33.9)
No	72 (66.1)
Would you recommend CAM to friends and family?	
Yes	103 (56.0)
Maybe	53 (28.8)
No	28 (15.2)
Reasons for CAM usage	
Works well	52 (18.6)
Less side effects than drugs	45 (16.1)
Affordability	43 (15.4)
Availability	36 (12.9)
Convenience	34 (12.2)
Easy to use	34 (12.2)
Safety	23 (8.2)
Other	12 (4.3)

CAM, complementary and alternative medicine.

CAM therapies were mostly used for back pain, general health and wellbeing, depression and anxiety and for general pain. Previous studies found that CAMs were mainly used for neck and back problems and arthritis<sup>5,16</sup>. A sizeable proportion of the respondents used CAM therapy for health promotion or disease prevention.

The high CAM usage among Central Appalachia residents has notable implications for delivery of conventional medical care

in the region. It is important for physicians, pharmacists, and nurses to be aware of this wide usage of CAMs by their patients because CAM therapies may interact with other medications they prescribe or dispense. Healthcare professionals need to be made aware of these findings and be encouraged to be vigilant and ask their patients about their CAM usage to provide truly patient-centered care.



**Table 3: Health problems prompting CAM use**

Condition treated (n=147)	Frequency (%)
Other (eg sleep, fibromyalgia, finger numbness, constipation, high blood pressure, cold/allergies, prophylaxis, anemia, nutrition, weight)	34 (23.1)
Back pain	23 (15.6)
General health and wellbeing	22 (14.9)
Depression and anxiety	11 (7.5)
Vitamin deficiency (eg calcium, vitamin D)	11 (7.5)
General pain (eg hip, shoulder, feet, legs, whole body, muscle)	11 (7.5)
Arthritis	7 (4.8)
Headache/migraine	7 (4.8)
Neck pain	6 (4.1)
Energy/fatigue	5 (3.4)
Diabetes	5 (3.4)
Stress	5 (3.4)

**Table 4: Sharing information about CAM usage with health professionals**

Survey item	Frequency (%)
Feel comfortable in sharing CAM usage information with medical personnel? (n=110)	
Yes	94 (85.5)
Maybe	12 (10.9)
No	4 (3.6)
Which healthcare professionals would you be likely to share information with? (n=209)	
Doctor	92 (44.0)
Pharmacist	60 (28.7)
Nurse/nurse practitioner	53 (25.4)
Other	4 (1.9)
Importance of sharing information with healthcare provider? (n=109)	
Very important	52 (47.8)
Somewhat important	31 (28.4)
Unsure	16 (14.7)
Not at all important	10 (9.2)

CAM, complementary and alternative medicine.

The results showed that many factors affect an individual's decision to use CAMs. The main reason respondents used CAM was that it worked well or was efficacious for their health concerns. Many other patients find CAM to be useful in improving their overall health as evidenced by the large and expanding global CAM market, estimated to be \$113 billion<sup>10</sup>. This positive belief in the efficacy of CAMs persists despite lack of formal evidence for the effectiveness and cost-effectiveness of many CAM therapies.

Although some CAM therapies are expensive and are not covered by third-party payers, many patients (22%) chose CAM therapies, citing their affordability. Given that most of the people in Central Appalachia are poor and unemployed, affordability is of significant importance. Interestingly, there was no significant relationship between CAM usage and insurance coverage status ( $p > 0.05$ ). This may suggest that CAM therapies are more affordable than other treatment options available to the respondents.



Contrary to the results of previous studies<sup>13,25</sup> most Appalachian patients (85.5%) were comfortable sharing their information about using CAM products with their healthcare providers, especially doctors and pharmacists. Eisenberg et al. found that 72% of the users did not inform their physicians about their use of CAMs<sup>13</sup>. Another national survey found that only 38.5% of the respondents disclosed their use of alternative therapies to their physicians<sup>5</sup>. It is unclear why respondents in this study were more willing and comfortable to share their CAM usage with their physicians and other healthcare professionals. The results could be explained by longer lasting and personal relationships that patients in small and rural communities in Central Appalachia have with their healthcare providers. Additionally, many healthcare professionals are not very opposed to the forms of CAM mostly used (eg vitamins, chiropractic, massage, and faith healing). These therapies are also frequently used by consumers in other parts of the USA<sup>13,18</sup>.

These study results show that level of education and annual gross incomes are significantly associated with CAM usage of respondents ( $p < 0.05$ ). This is similar to the results of Astin, who found that educational level predicted use of CAM<sup>18</sup>. Most CAM users in the Central Appalachia region tended to be of low income ( $< \$20,000$ ) and have high school education, contrary to previous studies which found that CAM users were mostly well-educated, affluent and middle-aged white people<sup>5,7,18,20</sup>. Another patient characteristic associated with CAM usage is having a primary care provider. The patients with a primary health care provider were more likely to use CAM therapies.

### **Future research**

More studies should be conducted to investigate why the Central Appalachians are more comfortable telling their doctors and other medical professionals about their use of CAM therapies, especially from the healthcare professional's point of view. Also, more studies should replicate this study, using a random and bigger sample.

### **Limitations**

This study did not provide a definition of CAM or alternative medicines, instead capturing the respondents' beliefs and opinions without biasing them. It is possible that different respondents had different ideas of what CAM is and is not. The study targeted participants who were seeking free conventional medical services at remote area medical events and therefore they may not be a good representation of the general population. Patients were not randomly selected – convenience sampling was used. This may limit the ability to generalize the findings. The study may not be generalizable to other areas given that Central Appalachia and its residents may be somewhat different to the rest of the US population in terms of access to forest and other natural products.

### **Conclusion**

People in the Central Appalachia region reported a prevalence of CAM usage higher than the national average. Most people utilized CAM because they believed it worked well, had fewer side effects, and was affordable; and CAM was used mostly by poor, less educated patients who mostly had a primary care provider. Most people in Central Appalachia were comfortable sharing their CAM usage information with their healthcare providers. More research needs to be conducted to understand CAM usage in rural communities in the USA.

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