

# Complementary and Alternative Medicine Use in a Heterogeneous Sample of Women

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## Abstract

This study examined prevalence of biologically-based Complementary and Alternative Medicine (CAM) use in adult women receiving care at three different sites in a health care system and to explore associated use of caffeine, alcohol, and tobacco. The Complementary and Alternative Medicine Prevalence Survey (CAMPS) assessed frequency, quantity and reason for use of 36 biologically-based CAMs and communication with a physician/pharmacist about use. CAMPS also assessed depressive symptoms and prior week use of alcohol, tobacco and caffeine. Of 289 participants, 83% reported CAM use in their lifetime, with 64% of respondents reporting regular use of at least one CAM. Only 51% of those using CAM reported informing their physician/pharmacist about it. African American women were less likely to report use than Caucasian women. Use was more prevalent among women reporting regular alcohol and/or caffeine use. Use of CAM is prevalent in this diverse sample of women. Under-reporting to medical providers suggests a need for screening in healthcare settings. Failure to do so could increase risk for interactions between CAM and prescribed medications. Further, the association between CAM use and regular or problematic use of alcohol or caffeine consumption warrants further study focusing on potential consequences.

**Keywords:** Alternative medicine; Health care; Screening; Pregnancy; Multivitamin; Vitamin C

## Introduction

Health care approaches that are developed and used outside of modern western medicine are often considered complementary and/or alternative medicines. According to the National Center for Complementary and Integrative Health (NCCIH), complementary medicine is used together with conventional medicine and alternative medicine is used in place of conventional medicine [1]. Examining trends in National Health Interview Survey (NHIS) data, Clarke et al. found 32.3% of adults used complementary health approaches in 2002, and 35.5% in 2007. Rates have remained high; with the 2012 National Health Interview Survey reporting 33.2% of adults having used CAM therapy in the past year [2]. A secondary analysis examining sex differences in CAM use found that 59.1% of CAM users were women [3]. Further, rates of biologically based CAM, (i.e. herbal medicines such as vitamins, minerals, and other "natural products") are higher in Caucasians vs. African Americans [1,4].

Anecdotal reports of more patients using CAM recently triggered practitioner concern within the Virginia Commonwealth University (VCU) Health System for two main reasons. First, dietary supplements are regulated as foods and therefore subject to different regulations than prescription and over-the-counter drugs (e.g., manufacturers do not have to prove safety or efficacy of dietary supplements before

marketing) [1]. Such supplements are readily accessible in health food stores and over the internet. Second, even if the substance is properly identified on the label, little may be known of the potential side effects and/or interactions with other medications [5]. Although some forms of CAM present little to no risk to patients, others have been found to produce serious side effects and/or interact with conventional medicines, in many cases increasing drug toxicity, inducing or inhibiting drug-metabolizing enzymes, and even leading to fatality [5,6]. In other instances, interactions may occur between the herbal medicines themselves, affecting blood sugar levels or increasing risk of bleeding [6]. Most CAM users do so in addition to conventional medical care, however 63-72% of these patients fail to inform their providers about their CAM use [7]. Disclosure of CAM use is particularly low among minority populations [8]. Even if physicians are aware their patients are taking herbal products, the need for more validated herbal medicine claims through randomized clinical trials [6] coupled with the lack of comprehensive federal regulations and standards further inhibits physicians from advising patients appropriately. As a result, this may put patients at risk.

The present study was conducted by a team of investigators from the VCU Institute for Women's Health (IWH), a National Center of Excellence. The topic area was identified by a group of physicians treating women seen in one of the VCU Health System clinics. Specifically, the physicians expressed concern that patients' use of CAM could interact with other prescribed medications. The three VCU Health System clinics were intentionally selected because they

represented diversity with regard to age, race and socio-economic status. The purpose of the present cross-sectional study was to:

1) Establish the recent and lifetime prevalence of biologically based CAM use in women attending one of three clinics in the VCU Health System, and 2) Explore potential correlates of CAM use (such as demographics, use of other licit substances such as caffeine, alcohol and tobacco, and depressive symptomatology).

## Materials and Methods

### Study population and setting

Women were eligible to participate in this study if they were 18 years or older, English-speaking, and able to read and understand informed consent and survey documents. The survey was administered at three university-affiliated outpatient medical clinics with diverse populations: A suburban women's health practice serving predominantly middle to upper class women; a University student health clinic serving male and female students; and an urban, hospital-based gynecological clinic serving predominantly lower income women. The goal sample size was 300, with up to 100 completed surveys at each of the three clinics.

### Procedure

Prior to their medical appointment, women at all three sites were approached in their clinic waiting area by a member of the research team. They were given a short introduction to the study by a research assistant, who indicated the survey assessed use of biologically based CAM therapies (defined as substances found in nature such as herbs, foods and dietary supplements). Informed consent was obtained from all participants who were eligible and expressed interest in the study. Participants were given a 10-15 minute self-administered, CAMPS survey, which was completed either prior to or following their medical appointment. Upon completing the survey, women were thanked for their participation. No monetary compensation was provided. This study was approved by the VCU Institutional Review Board.

### Survey instrument

The Complementary and Alternative Medicine Prevalence Survey (CAMPS) was designed by the study team, with input from physicians providing care at the clinics. The CAM therapies listed in the survey were identified from a list of most commonly used biologically based CAM found on the website of the National Center for Complementary and Alternative Medicine (now the National Center for Complementary and Integrative Health). Section 1 focused on demographics (age, race, education, employment status, and insurance status), religious affiliation, pregnancy status, reason for that day's clinic visit, and use of prescription medications.

Section 2 comprised the crux of the survey and focused on biologically based CAM usage including age of first use, frequency and quantity of use, and the primary reason for using each CAM. Participants were asked to report any use, regular use, and current use (within the past 30 days) for 36 commonly used CAM therapies. Respondents were then asked to indicate the primary reason for use of each CAM therapy from a list of 20 potential health reasons (e.g., back pain, anxiety, insomnia, menopause, etc.). Perceived efficacy of CAM use was assessed using a 5-point scale from 'not at all effective' to

'extremely effective'. Additional space was provided for participants to report use of any additional CAM not listed in the survey. Participants who indicated ever using one or more CAM therapies were then asked why they chose CAM, if they informed their health care practitioner or pharmacist about their CAM use, how they learned about CAM, where they purchased it, why they discontinued CAM use (if applicable), and if any other family members also use CAM.

Section 3 focused on use of alcohol, tobacco and caffeine. Respondents were asked to report regular use of these substances, current use (within the past 30 days), age of first use, and frequency and quantity of use. The final section of the survey contained questions about the respondent's depressive symptomatology during the past week, utilizing the Center for Epidemiologic Studies Depression Scale (CES-D). This validated 20 item scale is widely used to measure depressive symptomatology in the general population [9]. Respondents recorded how they felt during the past week (e.g., I was bothered by things that don't usually bother me, I felt I was just as good as other people, I had trouble keeping my mind on what I was doing) on a 4-point Likert type scale (Rarely-less than 1 day, Some or a Little-1 to 2 days, Occasionally or Moderately 3 to 4 days, and Most or All of the time-5 to 7 days). Total scores range from 0 to 60; with scores of 16 and above indicative of depression.

### Statistical analyses

Statistical analyses used SPSS software 14.0 (February 16, 2006). Continuous variables (e.g. age) were described with means or medians as appropriate based on normality, while categorical variables were described with frequencies. Demographic variables and higher frequency (>10% at a site) CAM use patterns were then compared across the three clinic sites using Chi-square and Kruskal-Wallis. CAM use frequencies as a function of regular use of other substances (alcohol, caffeine, and tobacco) and past week depressive symptoms were also compared.

## Results

### Demographic characteristics

The overall sample consisted of 289 women, with 98 at the urban clinic, 101 at the student clinic, and 90 at the suburban clinic. The median age was 29 years overall (range 18-74 years). A Kruskal-Wallis test indicated a statistically significant difference in age across the three clinic settings ( $p < 0.001$ ), with median ages of 34.5, 21, and 46 years at the urban, student, and suburban clinics, respectively. Of the total study sample, 175 were Caucasian, 91 were African American, and 23 were other races. A Chi-Square analysis of race indicated a difference in race distribution across the clinics, with fewer proportion of Caucasians in the urban clinic ( $n=41$  vs. 67 in each of the other two clinics). There were more African Americans in the urban clinic ( $n=53$ ) than in either the student ( $n=16$ ) or suburban clinic ( $n=22$ ). Races marked as "other" occurred at higher frequency in the student clinic ( $n=17$ ) than in the urban ( $n=5$ ) and suburban ( $n=2$ ) clinics.

### CAM use

Prevalence of ever and regular CAM use, CAM use excluding vitamins and minerals (CAM-EVM), and use of specific CAMs reported on the survey are presented in Table 1.

Dietary supplement (CAM)	Ever tried (%)	Regular use (%)
Any CAM	83	63.6
CAM-EVM	61.9	33.7
Multivitamin	67	44.6
Vitamin C	39.8	22.1
<i>Echinacea</i>	26.5	6.1
Vitamin B12	21.1	9.5
Vitamin E	20.7	10.5
Green Tea	20.4	7.5
Ginseng	19.4	6.1
Fish oil	18.4	10.2
Garlic	15.3	5.4
Chamomile	14.6	6.1
St. John's Wort	13.6	3.7
Gingko	12.9	4.1
Soy	12.6	6.1
Zinc	12.6	4.8
Vitamin B6	11.6	4.4
Ginger	10.2	3.1
Mint	9.2	2.7
Glucosamine	8.8	4.4
Magnesium	7.8	3.4
Vitamin B1	6.1	2
Vitamin A	5.8	2.4
Vitamin B3	5.4	1.7
Royal Jelly	5.1	1.7
Valerian	5.1	2.7
Metabolite	4.4	1
Ephedrine	3.4	1.7
Beta carotene	3.1	0.7
Manganese	3.1	1
Alfalfa	2.7	0
Kava Kava	2.4	0
Lycopene	2.4	0.7
Saw Palmetto	2	0.7
Ragweed	1	0

Cat's Claw	1	0
Choline	1	0
Barberry	1	0

**Table 1:** Participant's reported use of CAM.

Overall, 83% of respondents had ever tried CAM and 63.6% had used at least one CAM on a regular basis in their lifetime. Most regularly used CAMs were a Multivitamin (44.6%) or Vitamin C (22.1%). Sixty-two percent of participants reported CAM-EVM use, with 33.7% reporting using at least one on a regular basis. The top five reasons for trying CAM were: For improved health (43.6%), curiosity (33.3%), conventional medicine practitioner suggested it (22.5%), conventional medicine too costly (7.9%), and conventional medicine failed (6.7%). Among participants using CAM (n=227), 51.1% had not informed their physicians of their CAM use.

Table 2 using bivariate analyses, depicts statistically significant differences in proportions for CAM use that was at least 10% prevalent

by at least one of the sites. While the student clinic site showed the highest percentage of having tried any CAM or CAM-EVM, *Echinacea*, glucosamine, fish oil, and soy had been tried with higher frequency at the suburban clinic site. Ginkgo, ginger, chamomile, and vitamins A, B6, and C were tried with higher frequency at the student site. There were no instances where a CAM was tried most frequently by patients at the urban site, and in fact, the urban site had the lowest reported frequency for ever trying CAM for all but Vitamin C (30.8% at the urban site, 26.5% at suburban site and 42.7% at student clinic).

Variable	Urban Clinic	Student clinic	Suburban clinic	p-value
	(n=98)	(n=101)	(n=90)	
Any CAM	76 (77.6%)	91 (90.1%)*	77 (85.6%)	0.011
Any CAM-EVM	46 (46.9%)	71 (70.3%)*	65 (72.2%)	<0.001
Glucosamine	4 (4.08%)	4 (3.96%)	18 (20.0%)*	<0.001
Fish oil	9 (9.18%)	19 (18.8%)	26 (28.9%)*	0.002
Ginger	4 (4.08%)	14 (13.9%)*	12 (13.3%)	0.034
Soy	5 (5.1%)	14 (13.9%)	18 (20.0%)*	0.007
Chamomile	8 (8.2%)	20 (19.8%)*	15 (16.7%)	0.046
Vitamin A	5 (5.1%)	11 (10.9%)*	1 (1.1%)	0.013
Vitamin B6	5 (5.1%)	16 (15.8%)*	13 (14.4%)	0.032
Vitamin C	36 (36.7%)	50 (49.5%)*	31 (34.4%)	0.048
Regular CAM use	50 (51.0%)	76 (75.2%)*	61 (67.8%)	<0.001
Regular CAM-EVM use	21 (21.4%)	43 (42.6%)*	35 (38.9%)	0.002
Regular Soy use	3 (3.1%)	4 (4.0%)	11 (12.2%)*	0.016
Regular Multivitamin use	33 (33.7%)	54 (53.5%)*	44 (48.9%)	0.007
Regular Vitamin C use	14 (14.3%)	28 (27.7%)*	23 (25.6%)	0.038

**Table 2:** Frequency (and percent) for lifetime CAM use by health clinic site [Note: Only CAM with a reported prevalence of at least 10% at one or more sites are included in the table (\*Indicates significantly higher CAM use)].

Similar trends were found for regular use, with the highest frequency of regular use of any CAM and CAM-EVM reported at the student clinic, and lowest frequencies reported at the urban clinic. Regular use of Multivitamins and Vitamin C were reported with highest frequency at the student clinic, while regular use of glucosamine, fish oil, and soy were reported with highest frequency at the suburban setting. The urban site had the lowest reported frequency

for regular use of CAM in all categories where CAM use had a prevalence of at least 10%. CAMs that had reported prevalence of at least 10% at one or more sites but were not statistically significantly different between sites were ginseng, garlic, St. John's Wort, Mint, Green tea, Multivitamin, Vitamins B12 and E, and zinc, as well as regular use of Vitamins B12 and E.

For CAMs with at least 10% use at one or more sites, statistically significant age differences were found for fish oil, green tea, and Vitamin C, as well as for regular use of fish oil. Those who had tried fish oil were older than those who had not (median age 37.5 years vs. 29.0 years,  $p=0.014$ ). This was also the case for those who had regularly used fish oil (median age 42.5 years vs. 29.0 years,  $p=0.004$ ). Conversely, those who had tried green tea or Vitamin C were younger than those who had not (median age 24.0 years vs. 32.0 years,  $p=0.009$  and 26.0 years vs. 32.0 years,  $p=0.036$ , respectively).

African Americans had the lowest prevalence of CAM use for all categories, with 67.0% reporting use of any CAM and 46.2% reporting use of CAM-EVM (Table 3). Likewise, 42.9% of African Americans reported regular use of any CAM, and 20.9% reported using CAM-EVM. Frequency was highest for the “other” race category for trying CAM-EVM and zinc, and for regular use of CAM-EVM.

Variable	Caucasian (n=175)	African American (n=91)	Other (n=23)	p-value
Any CAM	160 (91.4%)	61 (67.0%)	20 (83.3%)	<0.001
Any CAM-EVM	119 (68.0%)	42 (46.2%)	18 (75.0%)	0.001
Tried <i>Echinacea</i>	59 (33.7%)	13 (14.3%)	5 (20.8%)	0.002
Tried St. John's Wort	33 (18.9%)	5 (5.5%)	2 (8.3%)	0.008
Tried Multivitamin	137 (78.3%)	44 (48.4%)	14 (58.3%)	<0.001
Tried Zinc	28 (16.0%)	4 (4.4%)	4 (16.7%)	0.02
Regular use of Multivitamin	98 (56.0%)	23 (25.3%)	10 (41.7%)	<0.001
Regular use of Vitamin C	49 (28.0%)	12 (13.2%)	4 (16.7%)	0.018
Regular use of any CAM	131 (74.9%)	39 (42.9%)	15 (62.5%)	<0.001
Regular use of CAM-EVM	68 (38.9%)	19 (20.9%)	10 (41.7%)	0.009

**Table 3:** Differences in CAM use by race [Note: Only CAM with a reported prevalence of at least 10% at one or more sites are included in the table].

### CAM and other licit substance use

Regular caffeine use was reported by 62.2% of women surveyed, regular tobacco use by 29.9%, and regular alcohol use by 26.2%. Regular users of alcohol and caffeine were more likely to report any

CAM-EVM use, as well as regular CAM and CAM-EVM use (Table 4). No differences were found between regular tobacco users and the rest of the sample for either CAM or CAM-EVM use.

Substance	Regular user of substance (%)	Non-regular user of substance (%)	p-value
<b>CAM</b>			
<b>Alcohol</b>			
Tried CAM-EVM	72.7	58.3	0.025
Tried <i>Echinacea</i>	39	22.2	0.004
Tried Ginseng	31.2	15.3	0.002
Tried St. Johns Wort	20.8	11.1	0.034
Tried Chamomile	23.4	11.6	0.012
Tried Multi vitamin	77.9	63.4	0.02
Tried Vitamin B6	18.2	9.3	0.036
Tried Vitamin C	50.6	36.1	0.025
Tried Vitamin E	35.1	15.7	<0.001
Tried Zinc	19.5	10.2	0.035
Regular CAM use	79.2	58.3	0.001

Regular CAM-EVM	42.9	30.6	0.05
Regular Multi vitamin	61	38.9	0.001
Regular Vitamin C	35.1	17.6	0.002
Regular Vitamin E	18.2	7.9	0.012
<b>Caffeine</b>			
Tried any CAM	89.1	73.6	0.001
Tried any CAM-EVM	67.8	52.7	0.01
Tried <i>Echinacea</i>	30.6	20	0.047
Tried St. Johns Wort	18.6	5.5	0.002
Tried Multi vitamin	72.1	59.1	0.021
Tried Vitamin C	47	28.2	0.001
Tried Vitamin E	24.6	14.5	0.04
Regular CAM	76	43.6	<0.001
Regular CAM-EVM	41	21.8	0.001
Regular Multi vitamin	53.6	30	<0.001
Regular Vitamin C	28.4	11.8	0.001

**Table 4:** Significant differences of CAM use by regular users of alcohol and caffeine.

### CAM and depressive symptoms

A valid CES-D score was calculated for n=254 respondents. Of these, a depression score  $\geq 16$  was reported by 35.8% of women (n=91). Within this group there were no significant differences found between women who reported having ever used CAM as compared to those who reported no CAM use (36.9% vs. 29.7%, p=0.404). Although not statistically significant, a higher percentage of women in this group did report CAM-EVM use as compared to no CAM-EVM use (40.1% vs. 28.3%, p=0.058).

### Discussion

In this study, we report a high prevalence of lifetime CAM use (83%) in a diverse population of women. Further, 3 out of every 4 women who ever tried CAM (77%) report using at least one CAM regularly. Rates of CAM use varied across the 3 sites, with the highest percentage of participants having ever tried or used CAM regularly occurring at the student and suburban clinics. The higher use of CAM excluding vitamins and minerals in the suburban clinic (average age 46) is consistent with national survey data, which shows the highest rates (44%) of CAM use occurring among people aged 50-59 [10]. We observed African Americans reporting lower regular CAM use (21.1%) than Caucasians (70.8%), which has also been previously demonstrated in the literature [4].

Women who used alcohol and caffeine regularly were more likely to use CAM, while no differences were found among regular tobacco users. Holden et al. [10] also found an association between CAM use and patterns of moderate to heavy alcohol consumption. Future research on the interaction of CAM with these substances, in addition to prescribed medications, is warranted. While not statistically

significant, a trend was observed toward higher CAM-EVM use among women with depressed mood.

Among the top five reasons indicated for using CAM, three of these were in response to, or dissatisfaction with, conventional medicine, yet the majority (51%) of CAM users had not informed their physician or pharmacist that they were using CAM. This is consistent with previous findings which estimate as many as 63-72% of patients using CAM in addition to conventional medical care do not inform their healthcare providers of their CAM use [7]. National survey data further demonstrate that among the largest adult age group reporting CAM use (ages 50-59), two-thirds (67%) had not discussed their use with a healthcare provider [11].

These findings indicate a need for physician screening tools, particularly within clinics providing services to older suburban patients, and student populations. While many physicians are concerned about their patients' use of CAM and potential interactions with prescription medications, the reality of adding additional screening tools to lengthy assessment batteries in busy clinical settings poses a challenge. These findings may be useful in identifying risk groups where additional CAM screening is warranted. Associations found between CAM use and regular use of alcohol or caffeine also warrant further attention; in particular, quantity of use data should be examined to determine if heavier alcohol or caffeine use is related to CAM use.

If so, such women may represent a unique subgroup; one that might benefit from follow-up assessment and/or education about heavy/regular alcohol or caffeine consumption and potential interactions with CAM use [12]. To minimize practitioner time needed to screen for tobacco, alcohol, and other drug use, computer-delivered measures have been developed, with the goal of promoting integration with

routine medical care [13]. Such methods may promote more routine screening for CAM use, which in turn, can better alert practitioners to any risks associated with CAM and other medication interactions.

### Limitations

This study is descriptive and taken from a convenience sample in three clinics within the same health system; thus, generalizability may be reduced due to selection bias. In addition, the cross-sectional study design does not allow for causal inference. Third, measures of alcohol, tobacco, and caffeine use were limited to frequency, with no estimates of quantities consumed. Finally, study participants were adult women; findings may not generalize to other groups such as men or adolescents. Such populations may warrant future research, with subsequent comparisons to present study findings.

### Conclusion

Use of CAM is common among women seeking healthcare and is often not reported to clinicians. Given the potential for untoward interactions between CAM and prescribed medications, coupled with the lack of reported CAM use to medical professionals, a need for physician screening is apparent. Public health strategies that promote patient disclosure of CAM use to health care providers may be of benefit. The association between CAM use and the use of alcohol and caffeine found in this study provides additional support for future exploration of concurrent use of CAM with alcohol and caffeine.

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### Disclosure

The authors have no conflicts of interest to report.

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