

3-2007

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## Publication Info

Published in *The Journal of Alternative and Complementary Medicine*, Volume 13, Issue 2, 2007, pages 217-222.

Sharpe, P. A., Blanck, H. M., Williams, J. E., Ainsworth, B. E., & Conway, J. M. (2007). Use of complementary and alternative medicine for weight control in the United States. *The Journal of Alternative and Complementary Medicine*, 13(2), 217-222.

DOI: 10.1089/acm.2006.6129

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## Use of Complementary and Alternative Medicine for Weight Control in the United States

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### ABSTRACT

**Objectives:** The purpose was to assess the prevalence and correlates of complementary and alternative medicine use for weight control.

**Design:** A list-assisted random-digit-dialed telephone survey of adults was conducted in the fall of 2002 ( $n = 11,211$ ). The focus of the study was complementary and alternative medicine (CAM) use, other than dietary supplements, in the previous 12 months.

**Settings/location:** The sample of respondents was drawn from the total noninstitutionalized U.S. adult population residing in telephone-equipped locations.

**Subjects:** The sampling procedures were designed to obtain adequate representation of Hispanic and non-Hispanic black respondents. Data from the total sample of 11,211 were weighted to achieve an estimate of the U.S. population. Analyses focused on 372 people who had used CAM within the previous 12 months.

**Results:** Of the total, 3.3% ( $n = 372$ ) had used a CAM therapy in the previous 12 months. Higher adjusted odds ratios for CAM use were found among respondents who were exercising for weight control; using a lower carbohydrate, higher protein diet; using a nonprescription weight-loss product(s); overweight; physically active; and not satisfied with one's body (adjusted for age, race, gender, education, and city size). The most often used therapies were yoga (57.4%), meditation (8.2%), acupuncture (7.7%), massage (7.5%), and Eastern martial arts (5.9%). CAM users used CAM therapies on their own (62.6%), in a group setting (26.8%) or with a CAM practitioner (10.6%).

**Conclusions:** The use of CAM therapies other than dietary supplements for weight loss was relatively low. The most popular therapy was yoga, and the majority of CAM users used CAM therapies on their own. Persons who had used other weight loss methods had greater odds for using CAM in the previous 12 months, suggesting that CAM use is often added to other weight-loss strategies.

### INTRODUCTION

Complementary and alternative medicine (CAM) is a group of diverse medical and health care systems, practices, and products that are not considered to be part

of conventional medicine.<sup>1</sup> Recent findings from 31,044 adults ages 18 and older on the 2002 National Health Interview Survey revealed that 36% of adults in the United States had used CAM in the previous year. When the use of prayer specifically for health reasons was added to the

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definition of CAM, CAM use was 62%.<sup>2</sup> Women, persons with higher educational levels, persons who had been hospitalized in the previous year, and former smokers had relatively higher CAM use in the survey. Age showed an inverse U-shaped association, with younger and older persons using less CAM than middle-aged persons. The association of CAM use with race varied depending on the definition of CAM.<sup>2</sup> Findings from several national surveys of CAM use reveal that in the general population, CAM use is highest among women; whites; persons of higher educational attainment and income; and persons who are widowed or divorced, middle-aged, have poorer perceived health, or live in the western United States.<sup>3,4</sup> Persons who visit medical doctors are likely to seek out CAM practitioners concurrently, but between 63% and 72% of persons using various types of CAM do not disclose CAM use to their physician.<sup>5</sup>

Although the prevalence of CAM use for chronic medical conditions has been documented,<sup>2</sup> little is known about the prevalence and correlates of CAM use for weight loss or weight control. In a multistate telephone survey, 7% of respondents reported using nonprescription weight loss product use (e.g., shakes, liquids, powders, and pills),<sup>6</sup> yet little convincing evidence has been found for the effectiveness of weight loss supplements.<sup>7</sup> No data have been published describing the types of CAM therapies used for weight control, with the exception of nonprescription dietary supplements. Given the epidemic of obesity in the United States, CAM use for weight control has significant public health implications, particularly because little research exists regarding the effectiveness of CAM therapies for weight control and existing studies have methodologic weaknesses.<sup>8</sup> This report presents results from the National Physical Activity and Weight Loss Survey (NPAWLS) describing the prevalence and correlates of respondents' use of CAM therapies other than dietary supplements for weight control during the previous 12 months.

## MATERIALS AND METHODS

The National Physical Activity and Weight Loss Survey (NPAWLS) was a nationwide telephone survey conducted between September 2002 and December 2002. Survey questions included items pertaining to overall health status and quality of life, weight-control measures, and participation in physical activity. The overall objective of the study was to obtain data on individual physical activity and nutrition risk behaviors. The sample of respondents was drawn from the total noninstitutionalized U.S. adult population residing in telephone-equipped locations. Excluded from the referent population were institutionalized adults, those living in group quarters with 10 or more unrelated residents, adults without a telephone, and adults who did not speak English or Spanish well enough to be interviewed.

### *Sample design*

The design used a list-assisted, random-digit-dialed (RDD) sample of telephone-equipped households in the United States generated by preparing a list of all current operating telephone exchanges within each U.S. area code. These telephone exchanges, combined with all four-digit numbers from 0000 to 9999, were divided into blocks of 100 numbers each; each block was assessed for containing at least one residential number. Qualifying blocks were combined to create the sampling frame, from which numbers were systematically drawn. Nonresidential, nonworking, fax, and modem numbers were filtered to increase the connect rate of telephone interviews with eligible respondents.

The study was designed to obtain adequate representation of Hispanic respondents and non-Hispanic black respondents. A replicate design mixing telephone numbers from three independent samples was used to achieve desired racial/ethnic percentages in the final sample. The first independent sample consisted of a national RDD draw. The second and third samples were drawn from frames constructed to yield higher percentages of Hispanic and non-Hispanic black respondents. These two samples—one targeting Hispanic households and the other targeting non-Hispanic black households—were constructed by subsetting telephone exchanges in the national frame. Telephone exchanges were included in each respective subset if ethnic household incidence was greater than 20%. Ethnic household incidence was determined by area code exchange and U.S. Census-based demographic information.

### *Respondent selection within household*

A minimum of 15 attempts across at least 5 days was made to reach each sampled number. Interviewers first asked about the number of adults aged 18 and older in the contacted household, then asked all male and female adults in the household to be listed. The survey respondent was randomly selected from this roster. The survey had a total of 11,211 complete interviews, with a Council on American Survey Research Organizations (CASRO) response rate of 30.9%.<sup>9</sup> The CASRO response rate is an outcome rate with the numerator as the number of completed interviews and the denominator as an estimate of the number of eligible units in the sample. The cooperation rate was 51.4%, which is the proportion of all respondents interviewed of all eligible units ever contacted [complete interviews/(complete interviews + refusals + terminations)].

### *Weighting*

The weights for the NPAWLS data were calculated as the product of three components: (1) a sampling weight accounting for differential probabilities of selection, defined as the inverse of the product of the household selection probability and the respondent selection probability; (2) a post-stratification factor adjusting weight totals to 2000 U.S. Cen-

sus population figures by age, race/ethnicity, and gender, computed for each of the three independent samples, with the result that the sum of the adjusted weights for each sample would produce an estimate of the eligible U.S population; and (3) a factor scaling the weights for each sample to allow for estimates based on the combined data that would not overestimate population totals.

*Measures.* The questionnaire was created in the format and style of the Center for Disease Control and Prevention's Behavioral Risk Factor Surveillance Survey (BRFSS), including modules covering behaviors related to diet, weight control, physical activity, and CAM use. The NPAWLS questionnaire included a module of questions to assess use of nonprescription products for weight control, such as pills, powders, and liquids. A module of questions to assess use of all other CAM therapies followed the nonprescription products module. A report on the use of nonprescription dietary supplements for weight loss in this survey is available.<sup>10</sup> This report is focused on respondents who had used other CAM therapies besides nonprescription supplements in the previous 12 months. Introductory comments to respondents described these therapies as "unconventional weight control therapies you have used to support you in weight loss or weight maintenance. By unconventional we mean therapies that are not typically provided by a doctor, hospital or medical clinic. These therapies are sometimes called complementary, alternative, or integrative medicine."

In naming the CAM therapy that respondents used most often in the previous year, they were instructed not to include nonprescription products (as they had previously answered questions about supplements). Therefore, for this report, CAM users were those respondents who had used any CAM therapy besides weight loss supplements as their *main* (most often used) CAM therapy (i.e., "Please tell me what method or therapy you used the most in the past 12 months") during the previous year. Persons who initially said "yes" to CAM use in the previous year, but who subsequently named a non-CAM method (e.g., calorie reduction, exercise) as their main (most often used) CAM method were not categorized as CAM users. Sociodemographic covariates were gender, race/ethnicity, age, income and educational level, and city size. Independent variables were: having a chronic disease ("Has a doctor ever told you that you had high blood pressure, heart disease, or diabetes?"); used exercise for weight control ("Are you using physical activity or exercise to lose weight [or keep from gaining weight?]); ever used a low-carbohydrate, higher protein diet ("Are you currently on or have you ever been on a low-carbohydrate, higher protein diet such as Sugar Busters, The Zone, The Carbohydrate Addict's Diet, or The Atkin's Diet?"); ever used nonprescription products for weight control; body mass index category (weight in kg/height in meters<sup>2</sup>: Obese,  $\geq 30$ , Overweight 25 to 29.9, Normal/underweight  $< 25$ ); and body size satisfaction ("How do you feel about your body size right now?" Very satisfied, Somewhat satisfied, Not satisfied). Physical activity was mea-

sured with the 2001 BRFSS physical activity questions (<http://www.cdc.gov/brfss/questionnaires/pdf-ques/2001brfss.pdf>), and respondents categorized based on the CDC/American College of Sports Medicine recommendation<sup>11</sup> as: active/meets recommendation, insufficiently active, or inactive. Respondents also reported the frequency of use for their most-used CAM therapy ("Thinking about right now, or the most recent period of time you used this method or therapy during the past 12 months, how many days, weeks, or months have you been using it or did you use it?") and the format for the therapy ("When you used this method during the past 12 months, was it done on your own, with a group or class, or with an alternative therapy practitioner? 'On your own' includes the use of videos, audiotapes, or books to guide you.")

### Analysis

Data cleaning and management tasks were conducted in 2003/2004 and the analysis was performed in 2004/2005. Frequencies and percentages were computed with SAS version 8.02 (SAS Institute, Cary, NC). Odds ratios were computed with SUDAAN (RTI, Research Triangle Park, NC), software that weights the data, thereby taking into account the complex sampling design, and adjusts for the under- or overrepresentation of population segments due to nonresponse. Respondents with missing data for one or more of the sociodemographic covariates or behavioral/health status predictors were excluded. Respondents who initially indicated that they had used CAM in the previous 12 months but subsequently named a mainstream weight-control method were categorized as not having used CAM in the previous 12 months. The independent variables were coded as dichotomies or trichotomies. Adjusted odds ratios were computed to determine the association between CAM use for weight control and health status or behavioral variables. Of the total completed interviews, 804 respondents were missing on one or more of the sociodemographic covariates (age, race, sex, education, and city size), and an additional 1200 were missing on one or more of the behavioral and health status variables, resulting in a sample of 9207 for the final analyses.

## RESULTS

Of the 11,211 respondents, 372 respondents had used CAM for weight control in the past 12 months. Characteristics of the entire sample and for the CAM users are shown in Table 1.

Table 2 shows the most commonly used CAM therapies among respondents who had used CAM for weight control in the past 12 months. Yoga (including breathing techniques) was named by the largest proportion of respondents as their most used therapy in the previous 12 months, followed by meditation, massage, acupuncture, and Eastern martial arts (such as *t'ai chi* or *qi gong*). Other responses included hypnosis, subliminal messages, prayer, Pilates, guided imagery/visualiza-

TABLE 1. SAMPLE CHARACTERISTICS

<i>Characteristic</i>	<i>Total sample (n = 11,211) n (weighted %)</i>	<i>Have used CAM for weight control in the past 12 months (n = 372) n (weighted %)</i>
Sex		
Female	6516 (51.71)	295 (74.81)
Male	4695 (48.29)	77 (25.19)
Race/ethnicity		
White, non-Hispanic	7512 (70.85)	266 (76.24)
Black, non-Hispanic	1346 (10.88)	34 (4.63)
Hispanic	1573 (10.62)	46 (10.08)
All others	564 (5.84)	27 (8.31)
Don't know/refused/missing	216 (1.82)	3 (0.75)
Age, y		
18–34	3160 (31.36)	154 (45.83)
35–54	4437 (38.73)	151 (38.69)
55–99	3359 (27.71)	61 (14.19)
Missing/refused	255 (2.20)	6 (1.29)
Income		
≥\$50,000	3628 (36.27)	142 (43.93)
\$25,000–\$49,999	3291 (28.64)	109 (26.12)
≤\$24,999	2705 (20.91)	77 (17.17)
Don't know/refused	1587 (14.71)	44 (12.77)
Education		
>High school	1314 (10.97)	19 (4.40)
High school graduate	3048 (27.14)	61 (18.94)
Some college/technical school	3002 (27.45)	106 (29.69)
College graduate	3762 (33.61)	185 (46.71)
Refused	85 (0.83)	1 (0.26)
City size		
Large city (>100,000 people)	4217 (36.36)	169 (44.44)
Smaller city (30,000–100,000 people)	2784 (25.11)	91 (22.35)
Rural city (1000–2999 people)	2247 (20.96)	65 (20.16)
Small community/village (<1000 people)	1520 (13.85)	38 (10.87)
Don't know/not sure/refused	443 (3.72)	9 (2.18)

CAM, complementary and alternative medicine.

tion/affirmation, chiropractic, light therapy, colon cleansing, and energy healing. Responses among persons who could name a second ( $n = 93$ ) and third ( $n = 25$ ) most-often-used CAM therapy for weight control named the same top five as shown in Table 2 for the primary therapy. Among the 372 respondents, 363 respondents estimated the number of days they had used the primary method. The mean number of days of use in the previous 12 months was 146 (standard deviation = 140), with a range of 1–365 days and median of 93 days. The modes of delivery for the primary CAM weight control therapy were on one's own (including videotapes, audiotapes, or books for guidance) (62.6%), in a group or class setting (26.8%), and from a CAM practitioner (10.6%).

Table 3 shows adjusted odds ratios for CAM use for weight control in the past 12 months for several behavioral and health status variables, adjusted for age, race, gender, education, and city size. The odds ratios were not adjusted for income because 14% of respondents either refused to answer or did not know their income.

Using exercise for weight control at the time of the interview; ever using a lower carbohydrate, higher protein diet; ever using a nonprescription weight loss product; being overweight; being active: either active/meets the guideline or insufficiently active to meet the guideline; and not being satisfied with one's body were associated with significantly higher odds of using CAM for weight control in the past 12 months. Self-rated general health (excellent to poor) ( $p = 0.53$ ) and having a diagnosis of heart disease, diabetes, or high blood pressure (yes, no) ( $p = .64$ ) were not significantly associated with CAM use in the past 12 months, and these data are not shown in the Table 3.

## DISCUSSION

The NPAWLS is the first survey to assess dietary behavior, physical activity, weight-control behavior, and CAM use in a large national sample, with sampling techniques to

TABLE 2. CAM THERAPIES USED MOST OFTEN FOR WEIGHT CONTROL<sup>a</sup> (N = 372)

Therapy	n	Weighted %
Yoga	208	57.40
Meditation	33	8.18
Massage	25	7.46
Acupuncture	22	7.74
Eastern martial arts	20	5.88
All other CAM therapies combined	64	13.34

<sup>a</sup>Not including nonprescription supplements, during the past 12 months.

CAM, complementary and alternative medicine.

ensure large numbers of Hispanic and black/African American respondents. A strength of the study is that respondents were asked to name their primary CAM method for weight control, so that their responses could be coded and any mainstream methods misreported as CAM could be eliminated. Even when the interviewer provided a definition of CAM, 70% of respondents who initially said they had used CAM in the previous 12 months named a therapy that reasonably could be considered CAM, whereas the remaining 30% named a mainstream approach such as calorie or fat restriction or exercise. Other strengths of the study are that the survey was conducted in both English and Spanish and

used a population-based sample rather than a convenience sample. The broad range of dietary, weight control, and physical activity behaviors asked about in the survey made possible an examination of associations between these lifestyle behaviors and CAM use for weight control.

A limitation of the study is the relatively low CASRO response rate of 30%. This rate was partially because of the survey design, which mixed telephone numbers from three independent samples to achieve racial/ethnic target proportions for Hispanic and non-Hispanic black respondents. Pre-targeting of ethnic groups, which is not done by the BRFSS, increases the number of phone calls that are made to urban minority areas. Although this approach oversampled minority groups to increase the number of participants in these strata and to allow for subgroup analyses, these subgroups had low response rates and therefore the overall response rate is lower than one might expect to get in a random sample. Increasing cellular phone use and avoidance of suspected telemarketing calls may have negatively affected the response rate. Although the response rate was lower than optimal, this was unlikely to result from any particular characteristic of the NPAWLS questions, topics, or methods. Response rates for all types of surveys have shown a widespread decline in recent years.<sup>12</sup> When contact was successful and eligibility could be determined, the cooperation rate was 51.4%.

TABLE 3. SIGNIFICANT ADJUSTED BIVARIATE ASSOCIATIONS WITH USE OF CAM FOR WEIGHT CONTROL (N = 9207)

Behavioral and attitudinal variables	n	Weighted % for total sample	Adjusted % Used CAM past 12 mo	Used CAM in the past 12 months		
				AOR Used CAM past 12 mo	95% CI	p value
Used exercise for weight control						
Yes	3966	42.5	5.2	2.71	1.99, 3.69	<0.0001
No or not controlling weight	5241	57.5	2.0	1.00		
Ever used lower carbohydrate/higher protein diet						
Yes	1287	13.4	5.4	1.75	1.26, 2.43	0.0008
No	7920	86.6	3.2	1.00		
Ever used nonprescription product for weight control						
Yes	1664	17.7	5.2	1.77	1.31, 2.38	0.0002
No	7543	82.3	3.1	1.00		
Body Mass Index category						
Obese (≥30)	1957	20.9	3.8	1.35	0.93, 1.96	0.1106
Overweight (25 to 29.9)	3309	36.6	4.5	1.63	1.19, 2.22	0.0022
Normal/underweight (<25)	3941	42.5	2.9	1.00		
Physical activity level (CDC/ACSM recommendation for moderate or vigorous physical activity)						
Active, meets guideline	4396	49.0	4.5	5.68	2.82, 11.45	<0.0001
Insufficiently active	3562	38.3	2.9	3.52	1.73, 7.19	0.0005
Inactive	1249	12.7	0.9	1.00		
Body satisfaction						
Not satisfied	1735	18.0	4.6	1.56	1.04, 2.33	0.0318
Somewhat satisfied	4370	48.5	3.4	1.15	0.84, 1.56	0.3889
Very satisfied	3102	33.5	3.0	1.00		

Note: Models were adjusted for age, gender, race, education, and city size.

CAM, complementary and alternative medicine; AOR, adjusted odds ratio; CDC, Centers for Disease Control and Prevention; ACSM, American College of Sports Medicine.

Another limitation of the study is that not all of the questions addressed the same time frame. Some questions did not address a specific time frame or addressed the present, whereas others referred to "ever" or to the past 12 months. This temporal issue, combined with the cross-sectional nature of the survey, prevents drawing conclusions about causal associations between the behavioral and health status variables and use of CAM therapies for weight control. Additionally, there are likely to be other behavioral, social, and health status variables associated with CAM use for weight control that were not included in the NPAWLS questionnaire.

This report provides new information about CAM use for weight control in a very large sample of U.S. adults. The results show that people who had engaged in other weight control behaviors were more likely to have used CAM in the previous 12 months, a finding that suggests people may be using physical activity, lower carbohydrate/higher protein diets, and nonprescription weight loss products in conjunction with other CAM methods for weight control, or trying them one after the other. This pattern may indicate persistent unsuccessful attempts to lose weight by multiple methods. Although overweight persons had increased odds for using CAM for weight control in the past 12 months, it is of interest to note that of the 372 persons who had used CAM for weight control in the previous year, 156 (weighted % = 42.56) were not overweight or obese according to their BMI, as calculated from self-reported weight and height.

## CONCLUSIONS

Only 3% (weighted) of the total respondents had used CAM for weight control in the previous 12 months; 5% (weighted) of respondents who were trying to lose weight at the time of the interview had done so. These results indicate that the use of CAM therapies for weight loss, other than nonprescription supplements, is relatively low. The method of choice by far was yoga, trailed by meditation, massage, acupuncture, and Eastern martial arts as the top five. Neither the potential direct effects of these methods on weight control, nor the potential indirect effects (e.g., stress reduction attained via these therapies might aid in dietary adherence) have been adequately investigated. Consequently, the effectiveness of these methods for weight loss is unknown.

## ACKNOWLEDGMENTS

The authors appreciate the assistance of Heather Bowles, Ph.D., Brent Hutto, M.S.P.H., Lara Peck, M.P.H., and Deborah Jones, Ph.D., in the preparation of the manuscript. This research was funded by a cooperative agreement from the Centers for Disease Control and Prevention (Atlanta, GA)

(U48/CCU409664) to the University of South Carolina Prevention Research Center (Columbia, SC). The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

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