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Use of Provider-Based Complementary and Alternative Medicine by Adult Smokers in the United States: Comparison From the 2002 and 2007 NHIS Survey

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Abstract

Purpose—To provide a snapshot of provider-based complementary and alternative medicine (pbCAM) use among adult smokers and assess the opportunity for these providers to deliver tobacco cessation interventions.

Design—Cross-sectional analysis of data from the 2002 and 2007 National Health Interview Surveys.

Setting—Nationally representative sample.

Subjects—A total of 54,437 (31,044 from 2002; 23,393 from 2007) adults 18 years and older.

Measures—The analysis focuses on 10 types of pbCAM, including acupuncture, Ayurveda, biofeedback, chelation therapy, chiropractic care, energy therapy, folk medicine, hypnosis, massage, and naturopathy.

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Manuscript format: research; Research purpose: descriptive; Study design: nonexperimental; Outcome measure: behavioral; Setting: national; Health focus: smoking control; Strategy: skill building/behavior change, policy; Target population: adults; Target population circumstances: education/income level, race/ethnicity

Analysis—The proportions of current smokers using any pbCAM as well as specific types of pbCAM in 2002 and 2007 are compared using SAS SURVEYLOGISTIC.

Results—Between 2002 and 2007, the percentage of recent users of any pbCAM therapy increased from 12.5% to 15.4% ($p = .001$). The largest increases occurred in massage, chiropractic, and acupuncture. Despite a decrease in the national average of current smokers (22.0% to 19.4%; $p = .001$), proportions of smokers within specific pbCAM disciplines remained consistent.

Conclusion—Complementary and alternative medicine (CAM) practitioners, particularly those in chiropractic, acupuncture, and massage, represent new cohorts in the health care community to promote tobacco cessation. There is an opportunity to provide brief tobacco intervention training to CAM practitioners and engage them in public health efforts to reduce the burden of tobacco use in the United States.

Keywords

Smoking; Acupuncture; Massage; Chiropractic; Training; Tobacco Use Cessation; Prevention Research

PURPOSE

Tobacco is still the leading preventable cause of morbidity and mortality in the United States, accounting for 443,000 deaths annually between 2000 and 2004,¹ and causing 5.1 million years of potential life lost in this 4-year time span.¹ Tobacco use is also costly, with an estimated \$96 billion spent annually on health care attributable to smoking in the same period.¹ Decades of public health tobacco control efforts have led to steady declines in tobacco use. However, years of steady downward trends in smoking prevalence have leveled off, particularly in low-education populations, prompting public health calls for new and expanded approaches to promote tobacco cessation.²

The 2008 Public Health Guideline on Treatment of Tobacco Dependence recommends a range of medications and intervention strategies, indicating that effective treatments are more numerous and accessible, yet the leading evidence-based treatments remain underutilized, particularly in low-education populations.³ Combined pharmacotherapy and behavioral interventions are the most effective strategies for smoking cessation⁴; however, 75% of primary care physicians are still focused on pharmacotherapy interventions alone, and less than a third report referring to behavioral therapy programs or cessation experts in conjunction with medication or nicotine replacement.⁵ Although patients themselves report receiving advice to quit smoking from their practitioner (70% of smokers and 68.7% of recent quitters),⁶ a considerably lower percentage of smokers report that their practitioner discussed strategies for smoking cessation (36%) or made them aware of smoking-cessation medications (37.6%).⁶ When physicians do advise cessation, it is more likely to occur if they have the confidence to counsel patients about smoking or have trained staff to provide such counseling.⁵

The finding that 72% of quit attempts are made without therapeutic assistance, despite the wide availability of treatment and support options,⁷ emphasizes the need for increased

offerings of brief tobacco interventions within health care provider encounters. Brief interventions (BIs) assess readiness and motivation to quit, and can involve discussing a strategy for quitting with current evidence-based treatments, such as medication and quitlines, that are available to tobacco users. Even 1- to 3-minute clinician contacts can increase abstinence rates, and input from a variety of clinician types has been shown to enhance quit attempts.³ For decades, tobacco cessation training efforts have focused primarily on conventional biomedical practitioners, particularly physicians.⁸ The 2008 Public Health Guideline recommends expansion of BI training to other conventional health care practitioners (e.g., nurses, pharmacists, dentists).^{9–11} However, few efforts have been made to offer BI training to practitioners outside of conventional medicine.¹² There is an opportunity to train complementary and alternative medicine (CAM) practitioners to deliver tobacco BIs based on the percentage of smokers using CAM therapies.

In 2007, 38.3% of the U.S. population reported using some CAM therapy in the previous 12 months.¹³ Most commonly used CAM therapies were special diets and natural foods, deep breathing exercises, osteopathic/chiropractic manipulation, massage therapy, and yoga.¹³ High rates of CAM use have been reported by ethnic and racial minority groups,^{14–16} groups with lower socioeconomic status,^{17,18} and specific condition-based populations (e.g., HIV/AIDS, diabetes, cancer).^{15,19} Several of these specific groups also have higher rates of tobacco use than the general population, further contributing to health disparities.¹ Additionally, those who are uninsured or underinsured may use CAM therapies as a more economical approach to both primary and specialty health care.¹³ The 2002 as well as the 2007 National Health Information Survey (NHIS) revealed that adults were more likely to seek CAM if they had delayed their use of conventional medical care because of concerns about cost, or if cost of conventional care was unaffordable.^{13,18}

Not all CAM use requires interaction with a practitioner—for example, home-based yoga practice or taking vitamin or herbal supplements—yet publications often combine these practices into one category. Provider-based CAM (pbCAM) therapies are those CAM therapies delivered by practitioners trained (and in most states, licensed or certified) to provide specific CAM therapies. pbCAM is of specific interest for this analysis because CAM practitioners have the potential to provide Public Health Service (PHS) guideline-based³ BIs to current smokers. Ten of the 18 NHIS CAM categories are considered pbCAM for this analysis (see Methods section). Compared to conventional physicians, pbCAM practitioners may see patients/clients more frequently and for longer appointments,^{20,21} providing ample opportunities for BIs and the potential to further expand the variety and networks of practitioners able to intervene with smokers. pbCAM practitioners are providing care to significant numbers of patients/clients with lifestyle-related chronic diseases and risky health behaviors.²² Some may provide specific tobacco cessation treatments (e.g., acupuncture)²³ within their scope of practice, yet few are trained to provide brief behavioral interventions with patients who are not specifically seeking CAM treatment for cessation support, or to incorporate PHS guideline recommended cessation aids, e.g. quitline referrals.

The profiles and patterns of pbCAM use by smokers offer valuable data on which to base new strategies for promoting tobacco cessation. To this end, the present study was designed to examine changes in adult smokers' use of pbCAM between 2002 and 2007, as detailed in

each year's NHIS, and to identify potential intervention opportunities for reaching smokers through pbCAM practitioners.

METHODS

Design

Data from a large, nationally representative household survey, the NHIS, were used for this study.^{24,25} In 2002, the NHIS started the CAM supplement, assessed every 5 years, including questions about 18 nonbiomedical health care practices such as visiting CAM practitioners, special diets, and use of vitamins and other supplements. Information about smoking and other health behaviors and conditions was also collected in the Adult survey. More details on survey design, content, and sampling specifics are available from <http://www.cdc.gov/nchs/nhis.htm>.

Sample

NHIS data were examined for adults over the age of 18 who completed the 2002 or 2007 Alternative Health/Complementary and Alternative Medicine supplements; data were matched to the Sample Adult Core survey^{24,25} provided during those years. Response rates for sample adults were 84.4% in 2002 and 78.3% in 2007.^{26,27} Although all sample adults were asked the questions on alternative health, some did not respond to this supplement. Data were not included if responses were missing or coded as “not ascertained” or “status unknown”; thus, 2.4% of 2007 sample adults and .8% of 2002 sample adults were removed.^{26,27} Overall, 54,437 respondents are included in the sample: 31,044 from 2002 and 23,393 from the 2007 sample.

Measures

Demographic Characteristics—Demographic characteristics included age (18–29, 30–39, 40–49, 50–59, 60–69, or 70 years), gender (male or female), race (White, black/African-American, American Indian/Alaska Native, Asian, other, or multiple race), ethnicity (non-Hispanic, Hispanic), educational attainment (less than high school graduate, high school graduate, some college, college graduate or more), ratio of income to poverty level, and residential region (Northeast, Midwest, South, or West).

Smoking Status—Current smokers were identified as persons answering yes to both (1) ever smoking 100 cigarettes, and (2) smoking “every day” or “some days” in the past 30 days.

pbCAM use—Only pbCAM therapies requiring interaction with a trained practitioner (i.e., no self-care therapies) were included in this analysis because the main purpose is to identify use of pbCAM therapies that also have potential opportunities for practitioners to deliver guideline-based cessation behavioral interventions, such as BIs and quitline referrals. Use of pbCAM in the past year was defined as a respondent reporting use of a CAM therapy in the previous 12 months that is delivered by a practitioner (e.g., “seen a practitioner for *acupuncture* in the past 12 months?”). Ten of the 18 NHIS CAM categories were asked in this format and were included in the analysis: acupuncture, Ayurveda, biofeedback,

chelation therapy, chiropractic care, energy therapy, folk medicine, hypnosis, massage, and naturopathy. Homeopathy was not included in the analysis because of differences between the 2002 and 2007 survey question format.

Analysis

Data were prepared using the Survey function in STATA (version 12.1, College Station, Texas; ref 18, 2002) and the SURVEYLOGISTIC procedure in SAS (version 9.2, Cary, North Carolina) to account for the complex sample design of the NHIS.^{26,27} All parameters were set according to NHIS instructions for the public use data set.^{27,28}

Differences in the percentage of respondents using any pbCAM therapies and specific pbCAM therapies and differences in specific pbCAM therapy usage among smokers between 2002 and 2007 were analyzed with χ^2 tests using the SURVEYLOGISTIC procedure.

RESULTS

Our analysis sample includes 54,437 respondents: 31,044 from the 2002 data set and 23,393 from the 2007 data set. The percentage of current smokers in the total NHIS sample fell from 22.0% to 19.4% ($p = .001$) between 2002 and 2007. Usage of pbCAM among all respondents significantly increased from 12.5% in 2002 to 15.4% in 2007 ($p = .001$). Using weighted frequencies to produce population estimates, this suggests over 17 million people in the United States use pbCAM services.

Table 1 displays demographic characteristics of the 2007 total NHIS sample, those who reported pbCAM use in the past year, and current smokers who used pbCAM in the past year. Smokers who use pbCAM are primarily non-Hispanic Caucasian and less than 50 years of age, and are more likely to be high school graduates or have some college as compared to nonsmokers who use pbCAM. There are significantly more male smokers and fewer female smokers who use pbCAM than nonsmoking pbCAM users; however, pbCAM users are still more likely to be female. CAM use is typically ascribed to those with higher levels of education and income,²⁹ whereas smokers typically fall in lower education and income categories.² This comparison shows the majority of smokers reporting pbCAM use tend to fall in the middle education category (some college) and the highest income category (with ratio of income to poverty level over 5.0) as reported in Table 1.

Between 2002 and 2007, the percentage of people using any pbCAM therapies in the previous 12 months significantly increased (Table 2), and corresponding increases were observed in the specific pbCAM therapies of massage therapy, chiropractic care, folk medicine, acupuncture, and Ayurveda therapy. In both 2002 and 2007, chiropractic care, massage, and acupuncture were the three most commonly used pbCAM therapies. Currently 14.02% of smokers report pbCAM use (Table 2), amounting to over 3 million people in the United States, and this percentage increased from 2002 (11.5%) to 2007 (14.0%, $p = .003$; Table 2). Within specific pbCAM therapies, there were nonsignificant increases in use by current smokers for most therapy types, with the exception of massage therapy, where the

percentage of use significantly increased from 4.2% to 6.7% in 2007 ($p = .001$) among smokers.

Further exploration within the three most widely used pbCAM practices reveals the proportions of smokers within those practices are near the general population proportion of smokers (19.4%; Table 3). The population estimates from this study demonstrate over 1 million smokers seek these CAM services, suggesting CAM providers are delivering health-related services to a significant number of smokers. These rates may continue to rise given the continued growth in CAM use across the nation, making CAM practitioners a large potential audience for BI trainings.

DISCUSSION

Between 2002 and 2007, rates of smoking in the general population declined and rates of pbCAM use increased, driven mostly by increased use of massage, chiropractic, and acupuncture therapies. Over 15% of the population (estimates at more than 17 million people) reported using pbCAM services in 2007, including a significant number of smokers. Current smokers use pbCAM in similar proportions as nonsmokers, and their sociodemographic characteristics suggest a moderate education level and higher incomes than are typically found within smoking populations.¹ The changes in smoking rates and pbCAM therapy usage presented in this analysis reveal a potential opportunity. Although the proportion of smokers is slowly declining in the general population, an increasing number of smokers are using pbCAM, and there is a significant prevalence of smoking among users of the three most common pbCAM therapies—chiropractic, acupuncture, and massage. Although there has been little change in smoking prevalence among people utilizing massage, chiropractic, and acupuncture, overall these practitioners are seeing an increasing number of the U.S. population and thus an increasing number of smokers who could potentially benefit from receiving PHS guideline-based BIs from these practitioners.

Practice-based tobacco cessation efforts have shifted from a focus on physician-delivered interventions to office system/team care intervention approaches.³ Likewise, tobacco cessation training is now being offered to a broader range of conventional health care professionals.^{9–11} Still, there have been few attempts to engage practitioners outside of biomedical practices in the tobacco cessation public health agenda. Given this information, targeting pbCAM practitioners for tobacco cessation BI training could expand the number of health practitioners prepared to encourage tobacco cessation through the use of effective treatments, such as BIs and quitline referrals. Although the percentage of current pbCAM users who are smokers is below the national rate,² it remains substantially above the goal of 12% set for the Healthy People 2010 and 2020 national health objectives. It is also the case that tobacco use remains one of the areas with significant health disparities.^{30,31} CAM practitioners are already providing health and wellness services to a significant number of smokers. With the previously steady declines in smoking prevalence in the United States now reaching a plateau^{1,3} and prevalence rates still well above national public health goals, it is time to engage CAM practitioners in the nations' public health tobacco cessation efforts.

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SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

After decades of tobacco control efforts, declines in tobacco use have slowed. Despite increased availability of varied and effective tobacco cessation aids, they remain underutilized. Tobacco cessation training is expanding from a focus on physicians to now include other biomedical practitioners, but few efforts have extended tobacco cessation training to complementary and alternative medicine (CAM) practitioners.

What does this article add?

This paper is the first to examine smoking among provider-based CAM (pbCAM) users and potential opportunities for CAM practitioners to promote tobacco cessation.

What are the implications for health promotion practice or research?

The increasing use of pbCAM by smokers signals an opportunity for new, expanded training to prompt motivation to quit and use of guideline-based tobacco cessation strategies by pbCAM users. Given the differences between biomedical and CAM practitioners, there is a need for guideline-based tobacco training that is tailored to the unique characteristics of CAM practitioners and their practice patterns.

Table 1

Characteristics of the 2007 Total Survey Population and Recent pbCAM Users Who Are Nonsmokers and Smokers[†]

	% Total NHIS Sample (N = 23,393)	% pbCAM Users Who Are Nonsmokers (n = 2858)	% pbCAM Users Who Are Smokers (n = 576)
Gender			
Male	48.28	39.60	46.07*
Female	51.72	60.40	53.91*
Race			
White only	81.02	86.67	91.72**
Black/African-American only	11.89	5.23	3.66
AI/AN only	0.99	1.02	1.38
Asian only	4.68	4.51	1.35***
Other race only	0.15	0.15	0.00
Multiple race	1.35	1.43	1.89
Ethnicity			
Non-Hispanic	86.62	92.39	95.41*
Hispanic	13.48	7.61	4.59*
Age			
18–29	22.09	16.92	28.12***
30–39	17.89	19.63	22.19
40–49	19.85	22.98	22.83
50–59	17.03	20.55	16.71*
60–69	11.89	11.63	8.05*
70+	11.23	8.28	2.10***
Education			
Less than 12 years	15.64	6.60	9.71*
High school graduate	28.92	19.71	28.38***
Some college	28.48	31.53	42.18***
College graduate or more	26.96	45.16	19.73***
Income to poverty ratio			
Less than 1.0	13.70	10.10	10.63
1.0–1.9	18.46	12.14	16.74**
2.0–2.9	16.57	14.27	18.82*
3.0–3.9	13.05	12.80	13.43
4.0–4.9	10.74	11.87	14.34
Over 5.0	27.48	38.81	26.03***
Region			
Northeast	17.12	17.15	14.94

	% Total NHIS Sample (N = 23,393)	% pbCAM Users Who Are Nonsmokers (n = 2858)	% pbCAM Users Who Are Smokers (n = 576)
Midwest	24.11	27.22	30.25
South	36.67	26.92	30.03
West	22.09	28.71	24.77

[†]Centers for Disease Control and Prevention/National Center for Health Statistics, NHIS, 2007. pbCAM indicates provider-based complementary and alternative medicine; NHIS, National Health Interview Survey; and AI/AN: American Indian/Alaska Native.

*
 $p < 0.05$.

**
 $p < 0.01$.

 $p < 0.001$.

Table 2
Changes in Percentage of pbCAM Users Between 2002 and 2007 Among the Total Sample and Current Smokers

Modality	Total Sample, %			Current Smokers, %		
	2002 (N = 31,044)	2007 (N = 23,393)	χ^2, p	2002 (n = 6816)	2007 (n = 4345)	χ^2, p
Any pbCAM	12.47	15.38	42.6, 0.001*	11.47	14.02	8.79, 0.003*
Acupuncture	1.04	1.41	8.81, 0.003*	0.72	0.97	1.46, 0.23
Ayurveda	0.07	0.10	15.47, 0.001*	0.02	0	—
Biofeedback	0.14	0.16	0.38, 0.54	0.17	0.18	0.003, 0.96
Chelation therapy	0.03	0.05	0.69, 0.41	0	0	—
Chiropractic care	7.40	8.39	9.83, 0.002*	6.82	7.77	2.29, 0.13
Energy therapy	0.52	0.55	0.07, 0.79	0.42	0.52	0.50, 0.48
Folk medicine	0.11	0.36	23.88, 0.001*	0.18	0.35	2.63, 0.10
Hypnosis	0.25	0.02	0.02, 0.91	0.48	0.50	0.01, 0.91
Massage	4.88	8.10	128.64, 0.001*	4.19	6.67	21.88, 0.001*
Naturopathy	0.24	0.33	2.39, 0.12	0.14	0.20	0.58, 0.45

† Centers for Disease Control and Prevention/National Center for Health Statistics, National Health Interview Survey, 2002, 2007. pbCAM indicates provider-based complementary and alternative medicine.

* Statistically significant, $p < 0.05$.

Table 3Percentage and Population Estimates of 2007 CAM Users Who Are Smokers^{*}

Modality	No.	Total Population Estimate[†]	% Smokers	Smoker Population Estimate[†]
Total sample	23,393	111,590,483	19.4	21,591,150
Acupuncture	344	1,570,466	13.3	208,599
Chiropractic	1855	9,370,048	17.9	1,676,672
Massage	1830	9,034,168	15.9	1,439,170

^{*} Centers for Disease Control and Prevention/National Center for Health Statistics, National Health Interview Survey, 2007. CAM indicates complementary and alternative medicine.

[†] Population estimates are computed using sample adult weights.²⁸