

CHAPTER 3

Integrative and Complementary Medicine Use in Adults With Chronic Lower Back Pain, Neck Pain, and Arthritis/Musculoskeletal Diseases

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1. INTRODUCTION

This chapter provides an overview of the distribution and factors that influence complementary and alternative medicine (CAM) use worldwide for chronic diseases, with an emphasis on musculoskeletal diseases and chronic arthritis/rheumatoid arthritis as well as symptoms commonly associated with these conditions (e.g., chronic neck and back pain). We additionally provide a summary of our recent research on the role of body mass index (BMI) on CAM use among normal weight, overweight, and obese adults in the United States with these conditions.

In the United States, four nationally administered surveys since 1990 have demonstrated that a third of American adults turned to CAM therapies for acute and chronic issues, with total expenditures for CAM therapies most recently estimated at \$34 billion in 2007.¹ Early trends suggested CAM usage for back pain was the highest commonly reported reason,² and a number of studies to examine the perceived benefits of various CAM modalities for patients who suffer from back pain followed.³ Yoga evolved as one of the more common CAM activities used to help reduce chronic low back pain,² with additional studies examining the benefits of yoga for overweight or obese persons with comorbid conditions.⁴ CAM use for pain management in patients with chronic musculoskeletal pain has been studied in the United Kingdom, with glucosamine and fish oil being the most commonly used treatments.⁵ Adult patients in this study remained active users of conventional medicine, but supplemented their care with CAM as a healing therapy for persistent pain.

Studies of healthy individuals have sought to investigate how attitudes of healthcare recipients impact CAM use beyond justifications based on dissatisfaction with conventional medicine. For example, McFadden and colleagues reported that among healthy

individuals, having a mindset congruent with CAM philosophies was the sole predictor of past CAM use, agreement with holistic balance (more narrowly focused as the mind-body relationship) was the sole predictor for current CAM use, and future CAM use was predicted by CAM philosophical congruence and influence from powerful others (e.g., doctors, family, friends).⁶ Alternatively, for chronic pain populations, factors such as having more control of their treatment plan have been reported at a higher rate compared to dissatisfaction with conventional medicine.⁷ A CAM adherence study examining perceptions of arthritis patients to the use of provider-based CAM found that viewing oneself as having a healthy lifestyle predicted CAM use.⁸

Results from additional surveys, such as the Canadian Community Health Survey, allowed researchers to begin reporting on the use of CAM with chronic diseases such as asthma, migraines, diabetes, and epilepsy.⁹ Nationwide observational studies in France on patients with musculoskeletal disorders noted patients with chronic musculoskeletal conditions (i.e., a duration of >12 weeks with their current episode) tended to seek care more often with practitioners offering alternatives to conventional medicine (e.g., homeopaths or regular prescribers of CAM).¹⁰ In Lagos, Nigeria, studies on childhood use of CAM for treating chronic health conditions (epilepsy, sickle cell anemia, and asthma) noted the high use of biological products as well as the influence of relatives, friends, and neighbors in making choices regarding CAM use.¹¹ Research on factors associated with pediatric use of CAM in Germany has been ongoing within the German Infant Study on the Influence of Nutrition Intervention birth cohort established in 1995, with 14% of 15 year olds contacted in 2011–13 reporting the use of at least one type of medicinal CAM in the preceding month.¹²

2. COSTS, QUALITY OF LIFE, AND PATIENT SATISFACTION WITH CAM

Studies addressing the cost of annual sick days due to back pain have been conducted for decades in countries such as Sweden and the United Kingdom.¹³ As CAM use has increased, a number of researchers have examined the overall impact to cost expenditures within healthcare systems for CAM users versus non-CAM users. For example, annual out-of-pocket expenses for vitamins/minerals and/or at least one form of CAM for cancer survivors and cancer-free adults in the US have been estimated at \$6.7 and \$52 billion, respectively.¹⁴ A 2012 study on US patients with back or neck problems showed that the spine-related medical expenditures were lower among CAM users compared to non-CAM users.¹⁵ Researchers have also quantified the higher costs associated with lost productivity due to lower back pain compared to the costs of different doses of CAM, such as number of sessions of spinal manipulative therapy.¹⁶ Comparison studies of private health plans have similarly shown the reduced cost of chiropractic care compared to costs associated with conventional treatments.¹⁷

Quality of life and patient satisfaction studies related to CAM use are difficult to evaluate in terms of direct cost savings, but can help healthcare providers understand both stressors and dissatisfaction points in various patient populations as related to the utilization of various CAM modalities. For example, Malaysian researchers within outpatient chemotherapy centers noted that CAM users reported higher financial burdens.¹⁸ In a systematic review comparing the costs of chiropractic care to other interventions for spine pain, Dagenais and colleagues noted that several studies noted high patient satisfaction with chiropractic care compared to receiving care from a medical physician or receiving an educational booklet about lower back pain.¹⁷

3. TRENDS IN CAM USAGE FOR TREATING LOWER BACK PAIN

Using data from the 2012 National Health Interview Survey, Ghildayal and colleagues reported that individuals suffering from lower back pain most commonly used herbal therapies compared to other CAM options.¹⁹ Additional studies have noted the efficacy outcomes with this condition when CAM treatments were applied immediately or at short-term follow-up.²⁰ The relevance of long-term use of CAM in this population is critical, given that estimates range from 10% to 62% for the percentage of this population that will develop chronic pain,²¹ and back pain or back problems rank within the top five medical conditions for which CAM was most used across multiple studies.²² In addition, the mean pain duration for patients with chronic pain has been reported as high as 9.8 years.⁷

Healthcare utilization costs for lower back pain have been estimated at \$100 billion a year, and these patients have been reported with rates of psychological distress at four times the rate of those without back pain.¹⁹ Due to the longevity and debilitating chronic nature of their medical conditions, this patient population has been reported to have significant concerns about permanent conventional drug intake, with some studies noting concerns about drugs at a rate four times more frequent than concerns resulting from bad experiences with conventional medical practitioners.²³ When comparing insured patients with back pain that do and do not use CAM providers, cost savings were noted in studies among CAM users, with reduced expenditures attributed to less inpatient care and reduced use of high-tech imaging.²⁴ Gender-based studies of back pain populations have noted that females tend to seek out CAM as a supplement, rather than a replacement, for conventional care.²⁵

4. TRENDS IN CAM USAGE FOR TREATING NECK PAIN

Among US adults, national surveys suggest the 38% utilizing some form of CAM therapy most commonly use it to relieve back or neck pain.²⁶ In 2007, neck and back pain together ranked as the most frequent reason for CAM therapies among children.²⁷ In

a recent study on pregnant women and CAM usage, patients reported consultations for neck pain were most often done with CAM practitioners only.²⁸ In a cohort study including patients with neck pain, Saha and colleagues found that a 2-week integrative medicine inpatient treatment including CAM demonstrated improved health outcomes related to improved pain intensity/disability, health-related quality of life, and mental health.²⁹

5. TRENDS IN CAM USAGE FOR TREATING MUSCULOSKELETAL DISEASES

For individuals with musculoskeletal conditions, CAM is most often cited for its use to improve pain and functional limitations.³⁰ Studies have additionally examined the use of CAM in patient populations using opioid therapy for chronic pain syndromes as a way to help guide physicians seeking information on the use of CAM therapies as initial or adjunctive treatments alongside the lowest-effective opioid dosing strategy.³¹ Given the economic burden of these conditions on healthcare systems, assessing the medical expenditures associated with musculoskeletal conditions often focuses on understanding the direct and indirect costs for specific CAM modalities. For example, studies on the use of neural therapy in this population compared to conventional medicine have suggested that direct costs may be higher due to longer consultations, but improved health outcomes in terms of fewer work incapacity attestations can lower indirect costs.³²

6. TRENDS IN CAM USAGE FOR TREATING ARTHRITIS

Given the high disability burden of arthritis in the United States³³ (approximately 22% of adults are diagnosed with this condition³⁴), researchers have sought to identify specific populations with comorbidities (e.g., cancer³⁵) as well as underserved populations³⁴ that may benefit from CAM-specific therapies. The use of CAM to treat stress in autoimmune diseases³⁶ has important implications for this population, particularly those with a family history of rheumatoid arthritis and especially because of the serious side effects of conventional therapy.³⁷ A study on CAM use among African Americans with rheumatoid arthritis found that, on average, patients tried three treatments, five activities, and consulted at least one CAM provider.³⁸ Additional studies examining the use of CAM in women across urban, suburban, and rural areas showed that supplements were commonly used across all locations.³⁹

7. SUMMARY OF OUR PREVIOUS RESEARCH

We have previously examined CAM use trends by normal weight, overweight, and obese persons with arthritis or other musculoskeletal diseases,⁴⁰ using data from

participants completing the 2007 National Health Interview Survey (NHIS)⁴¹ and the supplemental Adult Alternative Medicine module. Respondents completing this survey reported CAM use within the following domains defined by the National Center for Complementary and Alternative Medicine:⁴² (1) manipulative, including chiropractic approaches and massage; (2) mind-body, including meditation, prayer, and yoga; (3) biologically based, including herbs and diets; (4) energy therapies, including Reiki and magnet therapy; and (5) alternative/whole medical systems, including Ayurveda, homeopathy, and naturopathy.

A dataset consisting of 9724 adult Americans (≥ 18 years) provided the means to examine self-reported cases of chronic musculoskeletal diseases and chronic rheumatoid arthritis, stratified by BMI, along with the ability to include cases of self-reported chronic neck or lower back pain or limitation due to chronic disease (common symptoms of many forms of musculoskeletal diseases). As summarized in [Table 3.1](#), in addition to the variables noted above, the characteristics of the study population included age, gender, race/ethnicity, education, marital status, family income, insurance status, whether the participant had a regular source of care, and region of residence.

A complete description of the descriptive, bivariate, and multivariate logistic regression results is provided in Mbizo et al.⁴⁰ with an overview provided here. Key findings from this research based on demographic characteristics and health conditions included the following:

- CAM use was high ($>70\%$) for all groups with nonmissing data based on:
 - Age ($\chi^2 = 4.7, P < .01$)
 - Gender ($\chi^2 = 77.1, P < .001$)
 - Race/ethnicity ($\chi^2 = 13.1, P < .001$)
 - Education ($\chi^2 = 4.3, P < .01$)
 - Marital status ($\chi^2 = 10.6, P < .001$)
 - Family income ($\chi^2 = 75.0, P < .001$)
 - BMI status ($\chi^2 = 44.1, P < .001$)
 - Insurance status ($\chi^2 = 34.8, P < .001$)
 - Region of residence ($\chi^2 = 2.7, P < .05$)
 - With and without chronic neck pain ($\chi^2 = 22.6, P < .001$)
 - With and without chronic lower back pain ($\chi^2 = 21.9, P < .001$)
 - With and without limitation due to chronic disease ($\chi^2 = 152.1, P < .001$)
 - With and without chronic/rheumatoid arthritis ($\chi^2 = 73.3, P < .001$).
- Participants with a usual source of care had higher CAM use at 83% compared to those without a usual source of care, reporting CAM usage at 52% ($\chi^2 = 622.8, P < .001$).
- For those with self-reported chronic musculoskeletal diseases, CAM use was 50% compared to those without this condition reporting 80% usage, ($\chi^2 = 349.5, P < .001$).

[Figure 3.1](#) provides a summary of significant results in terms of those characteristics of the study population from [Table 3.1](#) with increasing odds ratio of CAM use (see [Table 3.1](#) for

Table 3.1 Characteristics of study participants

Independent variables	Sample characteristics (n = 9724)	
	Count	Weighted (%)
<i>Gender</i>		
Male (ref)	3816	39.5
Female	5908	60.5
<i>Race/ethnicity</i>		
White (ref)	7751	79.6
Black/African American	1466	15.1
Hispanic	123	1.2
Others	338	3.6
Missing	46	0.5
<i>Body mass index</i>		
Normal/underweight (ref)	3689	37.9
Overweight	3063	31.5
Obese	2972	30.6
<i>Age</i>		
<35 (ref)	1737	17.8
35–49	1495	15.5
50–64	1901	19.4
> 64	3193	32.8
Missing	1398	14.5
<i>Marital status</i>		
Married (ref)	5293	54.4
Widowed/divorced	2830	29.1
Single/never married	1565	16.1
Missing	36	0.4
<i>Education</i>		
Incomplete high school (ref)	1760	18.2
High school graduate	5585	57.3
College graduate	2105	21.7
Missing	274	2.8
<i>Family income</i>		
Less than \$35,000 (ref)	4273	44.0
\$35,000–49,999	1229	12.5
\$50,000–74,999	1300	13.4
\$75,000 or more	1816	18.9
Other (including missing)	1106	11.2
<i>Region</i>		
Northeast (ref)	1668	17.1
Midwest	2297	23.5
South	3499	35.9
West	2260	23.5

Table 3.1 Characteristics of study participants—cont'd
Independent variables

	Sample characteristics (n = 9724)	
	Count	Weighted (%)
<i>Have a usual source of care</i>		
Yes	8216	84.5
No (ref)	1508	15.5
<i>Insurance</i>		
Yes	8342	86.0
No (ref)	1382	14.0
<i>Chronic musculoskeletal disease</i>		
Yes	768	7.9
No (ref)	8956	92.1
<i>Chronic/rheumatoid arthritis</i>		
Yes	5100	52.5
No (ref)	4624	47.5
<i>Chronic neck pain</i>		
Yes	3105	32.2
No (ref)	6619	67.8
<i>Chronic lower back pain</i>		
Yes	6067	62.3
No (ref)	3657	37.7
<i>Limitation due to chronic disease</i>		
Yes	5399	55.8
No (ref)	4325	44.2

the reference characteristics). For example, patients reporting chronic/rheumatoid arthritis were 27% more likely to use CAM compared to those not reporting this condition (95% confidence interval, 1.10–1.45; $P < .01$). For the educational levels reported in [Table 3.1](#), those with high school education and those college graduates were 25% (95% confidence interval, 1.07–1.46; $P < .01$) and 49% (95% confidence interval, 1.21–1.83; $P < .001$) more likely to use CAM, respectively, compared to those with an incomplete high school education. Of additional note is that persons with a usual source of care were approximately three times more likely to use CAM compared to those without a usual source of care (95% confidence interval, 2.54–3.45; $P < .001$). For additional details on confidence intervals for the remaining items in [Figure 3.1](#) (and also in [Figure 3.2](#)), see Mbizo et al.⁴⁰

Alternatively, [Figure 3.2](#) summarizes significant results in terms of those characteristics where a decreased odds ratio of CAM use was observed. Notably, a 23% reduction in the odds of CAM use was found for those aged 50–64 (95% confidence interval, 0.64–0.92; $P < .01$), and those with a chronic musculoskeletal disease were 56% less likely

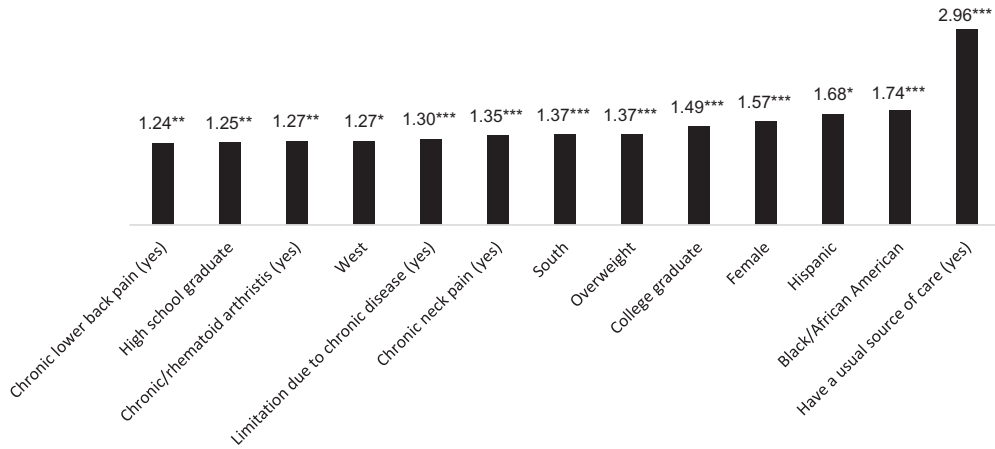


Figure 3.1 Significance levels: * $P < .05$, ** $P < .01$, *** $P < .001$.



Figure 3.2 Significance levels: ** $P < .01$, *** $P < .001$.

to use CAM (95% confidence interval, 0.37–0.52; $P < .001$), compared to the respective reference characteristics in Table 3.1. Marital status and having insurance were not significantly associated with CAM use ($P \geq .05$).

CAM use by BMI stratification provided additional insights into the proportion of CAM use by chronic disease status, as shown in Figure 3.3. BMI categories were defined as normal/underweight ($BMI < 25 \text{ kg/m}^2$), overweight ($25 \leq BMI < 30 \text{ kg/m}^2$), and obese ($BMI \geq 30 \text{ kg/m}^2$). Across all weight groups, 50% of persons with chronic musculoskeletal disease reported using CAM ($P < .001$). However, when stratified by BMI, for those persons

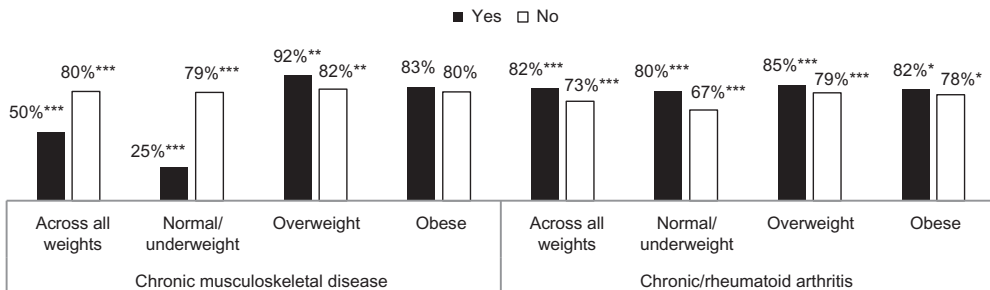


Figure 3.3 Significance levels: * $P < .05$, ** $P < .01$, *** $P < .001$; BMI = body mass index.

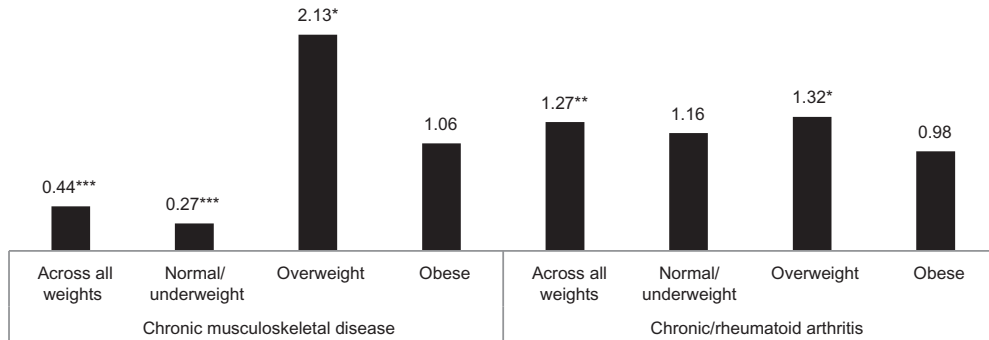


Figure 3.4 Significance levels: * $P < .05$, ** $P < .01$, *** $P < .001$; BMI=body mass index.

with chronic musculoskeletal disease, CAM use was highest among those overweight (92%, $P < .01$) and lowest in those underweight or with normal weight (25%, $P < .001$). The proportion of CAM use for obese chronic musculoskeletal disease patients was not statistically significant ($P \geq .05$). Alternately, CAM use was very high ($\geq 80\%$) across all weight groups and at each level of BMI for those with chronic/rheumatoid arthritis ($P < .05$).

The associated odds ratios of CAM use by chronic disease status, stratified by BMI, are summarized in Figure 3.4. Of note here is that for persons with chronic musculoskeletal disease, those overweight were more than two times more likely to use CAM compared to those overweight patients without chronic musculoskeletal disease ($P < .05$). Similarly, overweight patients with chronic/rheumatoid arthritis were 32% more likely to report CAM use compared to those overweight but not reporting having chronic/rheumatoid arthritis ($P < .05$).

The odds ratios of CAM use by race/ethnicity, overall and stratified by BMI, are summarized in Figure 3.5. Blacks/African Americans and Hispanics showed statistically significant increased odds of CAM use when compared to whites across all weight groups ($P < .05$). Increased odds of CAM use were also observed for these two races in the normal/underweight group after BMI stratification; however, these odds were not statistically significant ($P \geq .05$). Furthermore, blacks/African Americans who were overweight

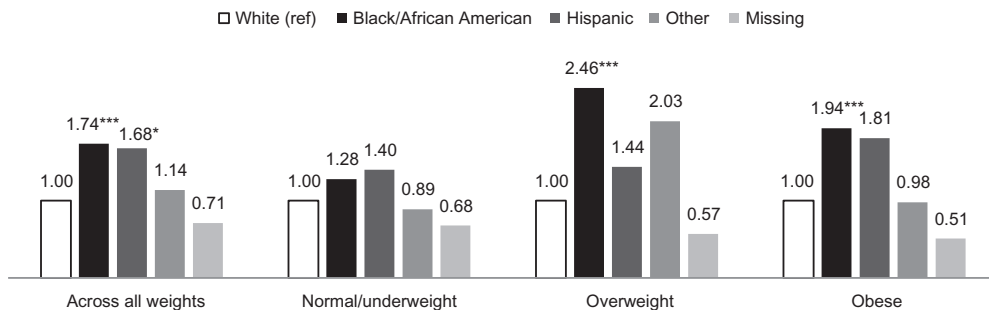


Figure 3.5 Significance levels: * $P < .05$, *** $P < .001$; BMI=body mass index.

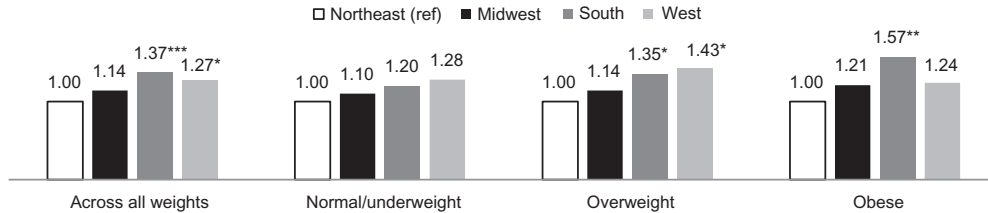


Figure 3.6 Significance levels: * $P < .05$, ** $P < .01$, *** $P < .001$; BMI = body mass index.

were 2.46 times more likely to report CAM use compared to white participants ($P < .001$). Obese blacks/African Americans were 94% more likely to report CAM use compared to whites ($P < .001$).

Across all weight groups, [Figure 3.6](#) summarizes how individuals from the South and West demonstrated the highest odds of CAM use at 37% and 27% increased likelihood compared to those from the Northeast, respectively ($P < .05$). However, when region of residence was stratified by BMI, it was observed that region of residence was not a significant indicator of CAM use for normal and underweight participants. Alternatively, those overweight participants from the South and West were 35% and 43%, respectively, more likely to report CAM use compared to Northeast residents ($P < .05$). For obese individuals only from the South, this likelihood increased to 57% ($P < .01$).

Additional results from BMI stratification in Mbizo et al.⁴⁰ included:

- Female gender was a statistically significant predictor of CAM use at all levels of BMI ($P < .001$).
- For educational levels, increased odds of CAM use were statistically significant for high school graduates at both the normal/underweight and overweight BMI levels, increasing from 1.32 to 1.65 ($P < .05$).
- Increased odds of CAM use were also statistically significant for college graduates at both the normal/underweight and overweight BMI levels, increasing from 1.57 to 2.25 ($P < .01$).

8. DISCUSSION

Studies comparing consumer motivations toward CAM noted a shift in 2005 where consumers were weighing the positive aspects of CAM more so than the negative aspects of conventional medicine.⁴³ Following these trends in 2007, consumers were spending nearly twice as much on self-care purchases of CAM products, classes, and materials (\$22 billion) compared to practitioner visits (\$12 billion).⁴⁴ Examining behavioral indicators,⁴⁵ demographic⁴⁶ and sociocultural factors,⁴⁷ and religious beliefs⁴⁸ for impact on CAM use will continue to be critical as future economic evaluations of CAM^{1, 15} attempt to identify specific clinical populations that may be best suited for educational

outreach. Equally important to these outreach efforts will be the consideration of ongoing studies identifying how the structure of healthcare systems impacts CAM utilization, particularly when there are delays in seeking conventional care⁴⁹ or cost considerations.⁵⁰

9. SUMMARY AND FUTURE DIRECTIONS

CAM use has gained popularity in the United States and the western hemisphere. Its growing acceptance both among native-born Americans and immigrants importing health practices from their lands of origin provides unique opportunities for systematic examinations of usage trends. Our work and those of others have provided observational yet convincing evidence of the prevalence of the use of numerous types of CAM modalities. The time has now come for more basic science studies to understand the biochemical processes by which these modalities work to improve health and wellness among users. Such studies should also address safety and toxicity effects so healthcare providers can be better informed regarding the relevance of patients sharing CAM usage information.

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