

Use of and Attitudes Toward Complementary and Alternative Medicine Among Osteopathic Medical Students

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Context: Complementary and alternative medicine (CAM) has grown into a huge health care industry in the United States, with 91.5 million people (38% of adults) using CAM in 2007. Given the increase in CAM use and the need for CAM education for health professionals, it is important to understand the baseline attitudes and beliefs of osteopathic medical students regarding CAM, as well as the factors that may have formed them.

Objectives: (1) To determine osteopathic medical students' use of different CAM modalities. (2) To assess osteopathic medical students' attitudes toward CAM using a previously validated instrument.

Methods: A previously validated, 29-item Integrative Medicine Attitude Questionnaire and a 10-item CAM Health Belief Questionnaire were administered to osteopathic medical students. Demographic and other data were collected on student use of and recommendations for CAM modalities as well as student awareness and use of primary CAM information resources.

Results: Survey respondents were 635 osteopathic medical students from 7 osteopathic medical schools and additional locations in the United States. Osteopathic medical students demonstrated positive attitudes toward CAM use. A total of 527 osteopathic medical students (83.0%) self-reported the

use of at least 1 CAM modality, whereas 69 students (10.9%) used just 1 CAM modality and 458 (72.1%) used 2 or more modalities. The most commonly used CAM modalities—meditation/yoga/relaxation/imagery, massage, and spirituality/prayer—were also most likely to be suggested to patients by osteopathic medical students. Sex, age, and the use of CAM modalities were significantly correlated with attitudes toward CAM modalities.

Conclusion: Osteopathic medical students had a positive attitude toward CAM and had high levels of self-reported CAM knowledge and use. Osteopathic medical students who acquire professional training and have personal experience with CAM may be in a better position to discuss CAM with future patients.

J Am Osteopath Assoc. 2012;112(7):437-446

Complementary and alternative medicine (CAM) has grown into a huge health care industry in the United States. In 2007, a total of 91.5 million people (38% of adults) in the United States used CAM,¹ spending \$33.9 billion out of pocket for visits to CAM practitioners and for the purchase of CAM products, materials, and classes.² The National Center for Complementary and Alternative Medicine (NCCAM) defines CAM as “a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine.”³ The NCCAM defines conventional medicine as “medicine as practiced by holders of MD (medical doctor) and DO (doctor of osteopathic medicine) degrees and by allied health professionals, such as physical therapists, psychologists, and registered nurses.”³ Complementary and alternative medicine includes yoga, biofeedback, chiropractic manipulation, use of herbal medications, homeopathy, ayurvedic medicine, spirituality, therapeutic touch, traditional Chinese medicine, hypnosis, relaxation therapy, and self-help groups. The National Center for Complementary and Alternative Medicine (NCCAM) was established by the federal government in 1998 and resulted in an increase in rigorous scientific investigation to evaluate CAM practices and to build an evidence base establishing the safety and effectiveness of these practices. The NCCAM has provided funding for research and education regarding

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Financial Disclosures: None reported.

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Submitted June 21, 2011; final revision received February 9, 2012; accepted March 23, 2012.

CAM practices in various medical schools, including some osteopathic medical schools.³

Numerous studies in the literature report allopathic medical students' attitudes toward CAM, but less information is known about the attitudes of osteopathic medical students toward CAM.⁴⁻¹⁰ The number of colleges of osteopathic medicine (COMs) in the United States has grown rapidly in recent years. Given the increase in CAM use and education, and given the growth of COMs, it is important to understand the baseline attitudes and beliefs of osteopathic medical students regarding CAM, as well as the factors that may have formed those attitudes.¹

A study by Kurtz et al,¹¹ which surveyed osteopathic primary care physicians, found a positive attitude toward CAM among study participants. The study¹¹ also found that (1) female physicians were more likely than male physicians to talk to their patients about CAM and to refer them for CAM modes of therapy; (2) younger physicians were more predisposed to use CAM for themselves and for their families, compared with older physicians; and (3) most physicians showed a willingness to use CAM or refer patients for CAM therapies for long-term problems. In another study, Saxon et al¹² explored the status of CAM education in the curriculum of COMs. They found that CAM courses were more likely to be required courses at COMs than at allopathic medical schools and that CAM courses were likely to be taught during the first 2 years of medical school. These CAM courses were likely to give introductory information about popular CAM-related topics.¹²

Berman et al¹³ tried to determine the difference in the practice of CAM by osteopathic and allopathic primary care physicians. They reported that osteopathic physicians were more open to CAM practices involving administration of medication and practices using procedural techniques. Berman et al¹³ also found that osteopathic physicians had more training in such CAM practices, were more likely to consider them legitimate, and were more likely to have used them. The validity of these investigations is limited by the lower rate of participation of osteopathic physicians (66 [8.4%] of 783 physicians) compared with allopathic physicians.¹³

Osteopathic medical schools focus on instilling in their graduates a holistic philosophy emphasizing mastery of and competence in hands-on diagnosis and treatment using osteopathic manipulative medicine.¹⁴ The objectives of the present study are (1) to determine the use of different CAM modalities by osteopathic medical students, and (2) to assess the general attitudes of osteopathic medical students toward CAM by use of a previously validated instrument. Because of osteopathic medicine's focus on holistic philosophy, we hypothesized that students at osteopathic medical schools will have positive attitudes toward CAM.

Methods

The protocol and survey forms were reviewed and approved by the institutional review board (approval 10E251) at Ohio University in Athens. The board ruled that the study was exempt because the data collected were anonymous.

Survey Instruments

After reviewing previous studies measuring attitudes toward CAM, we identified 2 questionnaires that would serve the objective of the present study.^{9,15} The first questionnaire, the Integrative Medicine Attitude Questionnaire (IMAQ), included 29 items and was designed to measure the attitudes of students and physicians toward CAM. The IMAQ has demonstrated adequate reliability and construct validity.¹⁵ The second questionnaire, the CAM Health Belief Questionnaire (CHBQ), included 10 items and was designed to measure medical student's attitudes toward and beliefs of CAM.⁹ The IMAQ and CHBQ items used a 7-point Likert-type scale to record responses (with 1 indicating absolutely disagree and 7 indicating absolutely agree). The total scale scores for the IMAQ and CHBQ are calculated by summing across the questionnaires' respective constituent rating items. Many items in the IMAQ and CHBQ rating scales are negatively worded to minimize acquiescence bias.

With permission, we adapted both questionnaires for use in the present study. Other questions related to CAM use were included from an existing instrument.⁹ In these questions, students were asked to check all relevant boxes in response to the following questions regarding 14 common CAM modalities:

- "Have you ever used it or are currently using it?"
- "Would you recommend using it [to nonpatients]?"
- "Have you ever recommended it to patients or would you consider recommending it?"
- "For each of the following CAM resources, answer the following questions: (1) 'Have you heard of it?' (2) 'If you have used it, do you find it useful?'"
- "Where do you obtain information and resources for evidence-based/educational materials on CAM?"

The survey also included questions to collect demographic information (ie, current year in medical school, sex, ethnicity, and age). SurveyMonkey (SurveyMonkey.com LLC, Palo Alto, California) was used to create an online version of the survey for the present study. The survey consisted of 46 questions.

Survey Participants

On October 22, 2010, we sent an e-mail to the deans of the 30 COMs and additional locations to introduce the survey

and request the participation of their students. Reminder letters were sent 6 weeks later to the deans who did not respond to the first letter. The deans who agreed to allow their students to participate were asked to forward both the electronically mailed study recruitment letter and an informed consent statement to all active medical students at their institution. The deans were blinded as to which students replied, and they were informed that they would receive, if requested, only group data and that neither data from individual students nor data from other institutions would be made available to them.

The recruitment letter was e-mailed with a link to the SurveyMonkey Web site (<http://surveymonkey.com>), which provided access to the CAM survey. Students were informed that the questionnaire was voluntary and that they would receive neither additional credit nor punishment for participating. Anonymous data were available to the school administration and researchers. All respondents were advised that by completing the survey, they were providing informed consent for their data to be used for research purposes. Once permission was given by the host COM, the surveys were sent electronically to the host institution for dissemination of the link to the Web-based survey. Responses were entered electronically and received by the investigators at the SurveyMonkey site. The researchers compared school-reported class size with the total number of responses received from each school. Data were collected from October 2010 to April 2011.

Data Analysis

Data were analyzed using SPSS statistical software (version 16; SPSS Inc, Chicago, Illinois). Descriptive statistics (frequencies, means, and standard deviations) were used to describe demographic characteristics and data on the use of and attitude toward CAM among osteopathic medical students. Recommendation and use of CAM modalities were explored and analyzed by school year. The survey used in the present study had a Cronbach's α value of .909. The mean total attitude scale scores for the CHBQ and the IMAQ were calculated by averaging and totaling ratings across all items. The IMAQ and CHBQ total attitude scale scores were also compared by year of medical school and by sex. Associations among survey variables were examined using Pearson correlation coefficient analysis. All statistical tests were 2 tailed, and a Cronbach's α value of .05 or less was considered statistically significant. All confidence intervals (CIs) are reportable at 95%.

Results

A total of 803 osteopathic medical students responded to the CAM survey. Responses were excluded for 168 participants because they did not complete the whole survey. Thus, a total of 635 responses of a potential 4003 osteopathic

medical students (response rate, 15.9%) from 7 osteopathic medical schools were included in the final analysis. However, because of the manner in which the survey was distributed, it is impossible to know the exact response rate. In other words, it is possible that some of the host institutions did not disseminate or disseminate completely the electronic surveys. The first survey was completed on October 22, 2010, and the final responses were collected on April 27, 2011. The number of study participants at each COM ranged from 29 to 149.

Demographics

The osteopathic medical students who responded to the survey had a mean age of 26.9 years and were predominantly white (512 [80.6%]). More female osteopathic medical students (365 [57.5%]) than male osteopathic medical students (270 [42.5%]) responded to the survey. The percentage of female osteopathic medical students who responded to the survey was higher than the overall percentage of osteopathic medical students who were female (52.81% male vs 47.19% female).¹⁶ The number (percentage) of osteopathic medical student respondents by school year was as follows: first year, 193 students (30.4%); second year, 172 (27.1%); third year, 138 (21.7%); and fourth year, 132 (20.8%). Most respondents were white (512 [80.6%]). *Table 1* shows the demographic characteristics of osteopathic medical students.

CAM Modalities Used and Recommended

A total of 527 osteopathic medical students (83%) reported self-use of at least 1 CAM modality, 69 (10.9%) used just 1 CAM modality, and 458 (72.1%) used 2 or more modalities. *Table 2* shows the self-reported use of CAM modalities among respondents. The most commonly used CAM modalities were meditation/yoga/relaxation/imagery (380 students [59.8%]), massage (375 [59.1%]), and spirituality/prayer (322 [50.7%]). Year in osteopathic medical school was not associated with self-reported use of CAM modalities ($P=.164$). The mean total number of CAM modalities used by osteopathic medical students who reported CAM use was 3.3. Female respondents were likely to use more CAM modalities than were male respondents (3.53 vs 3.01; $t=2.51$; $P<.011$). *Figure 1* illustrates the comparative difference in the use of CAM modalities by female and male survey respondents.

Older osteopathic medical student respondents were more likely than their younger counterparts to use a larger number of CAM modalities ($r=0.187$; $P<.01$). *Table 3* shows the likelihood of respondents suggesting various CAM modalities to a patient. Meditation/yoga/relaxation/imagery (356 students [56.1%]), massage (356 students [56.1%]), and spirituality and prayer (288 students [45.3%]) were the modalities most likely to be suggested to patients.

Table 1.
Characteristics of Osteopathic Medical Student Survey Respondents^a and Total Enrolled Osteopathic Medical Students

Variable	Respondents (N=635) ^b	Total Enrollment, 2010-2011 (N=19,427) ¹⁶
Sex		
Male	270 (42.5)	10,259 (52.8)
Female	365 (57.5)	9168 (47.2)
Age, y, Mean (SD)	26.9 (4.3)	NA
Race/Ethnicity		
White	512 (80.6)	13,405 (69.0)
African American	14 (2.2)	575 (3.0)
Asian	70 (11.0)	3773 (19.4)
Hispanic	16 (2.5)	664 (3.4)
Others	23 (3.6)	1006 (5.2)
Year of Medical School		
First	193 (30.4)	NA
Second	172 (27.1)	NA
Third	138 (21.7)	NA
Fourth	132 (20.8)	NA

^a Data are presented as No. (%) unless otherwise indicated. Some percentages do not total 100 because of rounding.
^b Respondents were US osteopathic medical school graduates recruited from 7 of the 30 osteopathic medical schools and additional locations solicited to participate in the study.

Abbreviations: NA, not available; SD, standard deviation.

Fourth-year students were more likely than first-year students to suggest CAM modalities to a patient ($t=-2.86$; $P=.004$). No significant difference was noted between second-, third-, and fourth-year students. Overall, female respondents were more likely than male respondents to recommend CAM modalities to a patient ($P=.01$). The number of CAM modalities recommended to patients was significantly lower than the number of CAM modalities recommended to nonpatients (4.00 vs 4.47 modalities; $t=4.14$; $df, 706$; $P<.0001$). This finding suggests that osteopathic medical students become more conservative when recommending CAM modality to a patient than to a nonpatient. *Figure 2* and *Table 3* show these comparisons.

Sources of CAM Information

The main source of CAM-related educational materials cited by osteopathic medical students included the Internet (538 students [88.8%]), journals (363 [59.9%]), books (319 [52.7%]), a health database (225 [37.1%]), and videos (47.9 [7.9%]). In addition to the aforementioned sources, some of the respondents received CAM information from other sources, including CAM practitioners, CAM lectures and classes, and health conferences. PubMed, the most commonly cited of the Internet health resources named (569 students [89.6%]), was found to be the most useful source by 543 respondents (85.5%).

Figure 3 and *Figure 4* show the various sources of CAM information cited by respondents.

Attitudes and Beliefs About CAM

For each of the 29 items in the IMAQ, we calculated the mean value. The total mean value of the 29 items was considered the IMAQ scale score. The IMAQ scale score for osteopathic medical students was 146.71 (SD, 16.83; range, 78.0-191.0; 95% CI for the mean, 145.4-148.0). Because the IMAQ scale score of 146.71 is greater than the hypothetical scale score midpoint of 116 (the midpoint of a 7-point Likert scale is 4, so $29 \times 4=116$), we report that, overall, students have positive attitudes and beliefs toward CAM ($P<.001$; 95% CI of the difference, 29.40-32.02). The CHBQ scale score of 50.68 is also greater than the scale score midpoint of 40.0, thereby affirming the positive attitude of osteopathic medical students toward CAM ($P<.0001$; 95% CI, 10.0-11.35). *Table 4* shows the mean response of osteopathic medical students to the IMAQ and CHBQ items. The standard deviation for each item in both scales ranged from .996 to 1.709 for osteopathic medical students.

The attitudes of female osteopathic medical students toward CAM were more positive than those of their male counterparts (IMAQ scale score: 149.78 vs 142.56 [$t=5.46$; $P<.0001$]; CHBQ scale score: 52.43 vs 48.31 [$t=6.10$; $P<.0001$]). The age of the respondents positively correlated to the IMAQ and CHBQ scale scores ($r=0.098$ and $r=0.084$, respectively) ($P<.05$). This finding suggests that older osteopathic medical students tend to have a more positive attitude toward CAM than do younger students. There was a statistically significant association between the total number of CAM modalities used by students and the IMAQ and CHBQ total scale score ($r=0.44$ and $r=0.39$, respectively; $P<.0001$). There was no significant difference in CAM attitudes (according to the IMAQ scale score) between different ethnic groups ($F_{4,630}=0.330$; $P=.858$). Second-year osteopathic medical students had a less positive attitude toward CAM than did first- and fourth-year students (IMAQ scale score, 144.08 vs 147.49 and 149.22 [$P=.049$ and $P=.01$, respectively]). Respondents, who reported using a greater number of CAM modalities, had higher IMAQ scale scores and, thus, demonstrated more positive attitudes toward CAM ($r=4.42$; $P<.01$).

The following 5 items from the IMAQ and the CHBQ received responses from osteopathic medical students that indicated strong agreement:

- “Osteopathic manipulative therapy is a valuable method for resolving a wide variety of musculoskeletal problems (beyond back pain).” (mean rating, 6.28)
- “Counseling on nutrition should be a major role of the physician toward the prevention of chronic disease.” (mean rating, 6.21)

Table 2.
Use of Complementary and Alternative Medicine Modalities
by Osteopathic Medical Students, by Year of Medical School, No. (%)

Modality Used	First (n=193)	Second (n=172)	Third (n=138)	Fourth (n=132)	Total (N=635)
Biofeedback	17 (8.8)	19 (11.0)	17 (12.3)	3 (2.2)	74 (11.7)
Hypnosis	14 (7.3)	8 (4.7)	9 (6.5)	6 (4.5)	36 (5.7)
Meditation/yoga/relaxation/imagery	130 (67.4)	104 (60.5)	75 (54.3)	77 (58.3)	380 (59.8)
T'ai Chi/Qi Gong	28 (14.5)	20 (11.6)	24 (17.4)	25 (18.9)	91 (14.3)
Traditional Chinese medicine	31 (16.1)	26 (15.1)	24 (17.4)	35 (26.5)	109 (17.2)
Ayurvedic medicine	14 (7.3)	7 (4.1)	11 (8.0)	6 (4.5)	37 (5.8)
Curanderismo	5 (2.6)	4 (2.3)	1 (0.7)	0	10 (1.6)
Chiropractic	65 (33.7)	46 (26.7)	31 (22.5)	39 (29.5)	175 (27.6)
Massage	119 (61.7)	108 (62.8)	76 (55.1)	74 (56.1)	375 (59.1)
Therapeutic touch/Reiki	24 (12.4)	14 (8.1)	14 (10.1)	22 (16.7)	71 (11.2)
Spirituality/prayer	109 (56.5)	87 (50.6)	67 (48.6)	67 (50.8)	322 (50.7)
Herbal/botanical supplement	87 (45.1)	64 (37.2)	53 (38.4)	58 (43.9)	251 (39.5)
Homeopathy	36 (18.7)	24 (14.0)	22 (15.9)	33 (25.0)	107 (16.9)
At least 1 modality used	166 (86.0)	146 (84.9)	106 (76.8)	109 (82.6)	527 (83.0)

- “A patient’s expectations, health beliefs, and values should be integrated into the patient care process.” (mean rating, 6.13)
- “The spiritual beliefs and practices of patients play no important role in healing.” (mean reversed rating, 6.11)
- “A strong relationship between patient and physician

is an extremely valuable therapeutic intervention that leads to improved outcomes.” (mean rating, 6.05).

Comment

To our knowledge, the present study is the first to report attitudes toward CAM and the use of CAM modalities in

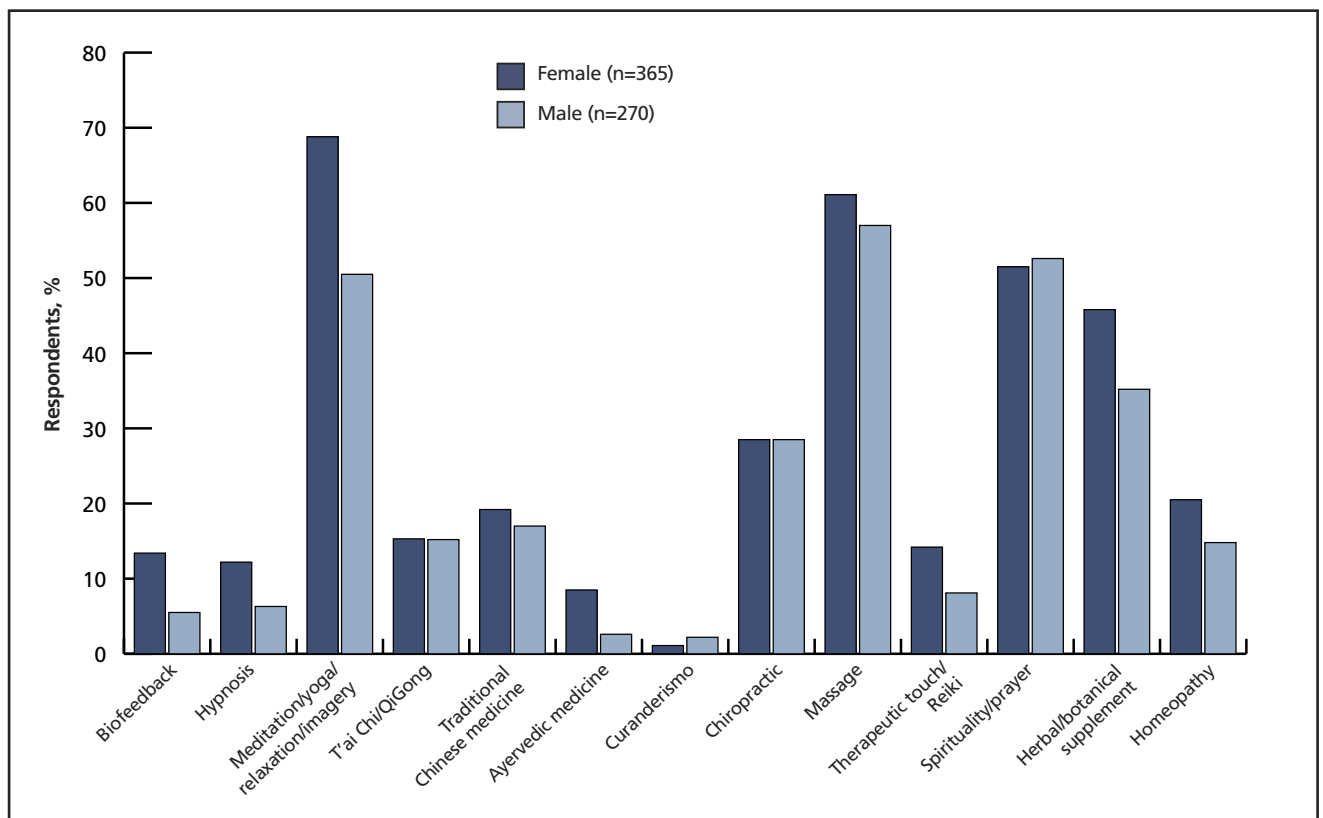


Figure 1. Use of complementary and alternative medicine modalities by osteopathic medical students, by sex.

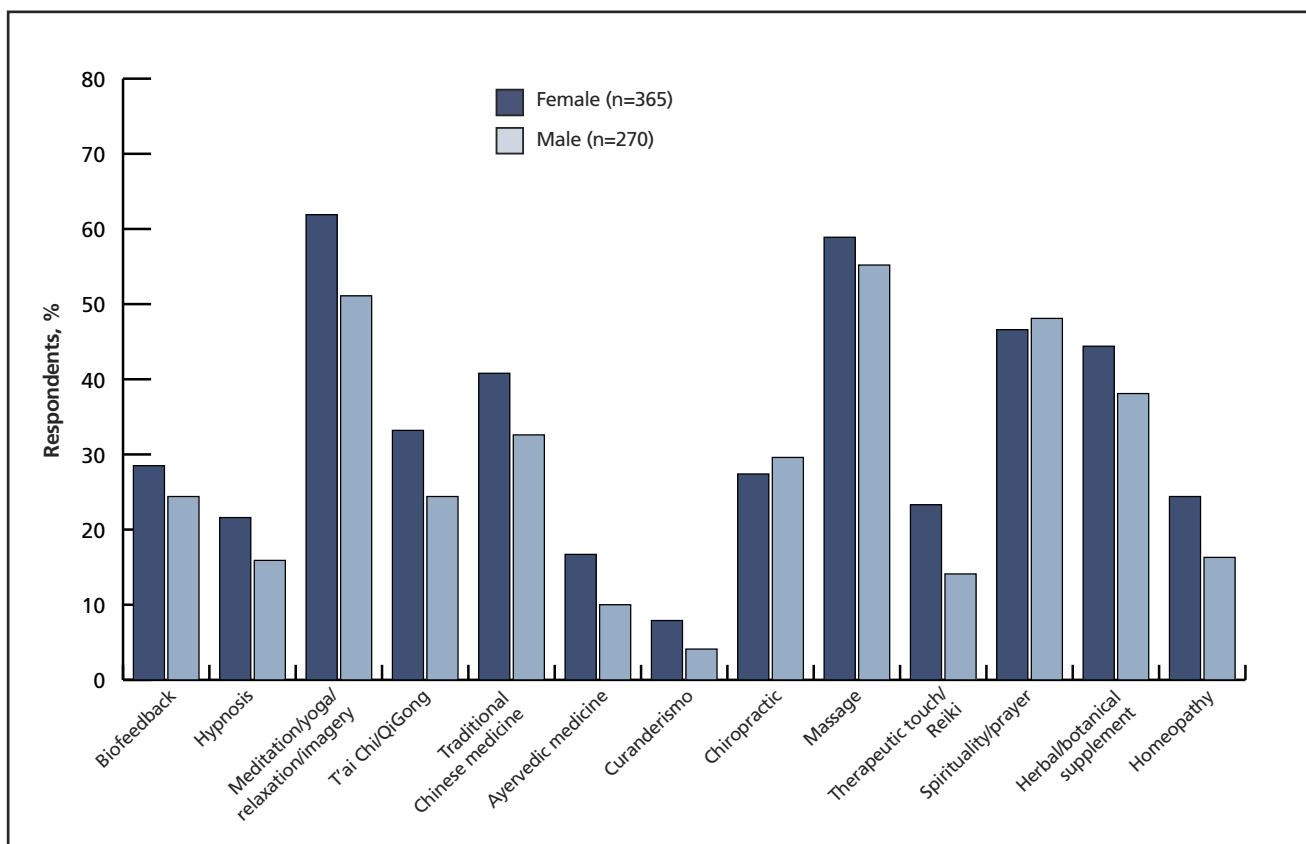


Figure 2. Likelihood of osteopathic medical students suggesting complementary and alternative medicine to a patient, by sex (% of respondents).

a nationwide sample of osteopathic medical students. In the current study, 83% of osteopathic medical students reported using at least 1 type of CAM modality, and the use of CAM by osteopathic medical students was considerably higher than the use of CAM in the general population.¹ Female osteopathic medical students were also likely to use a greater number of CAM modalities and were more likely to recommend CAM to a patient, compared with their male counterparts. These findings are consistent with those of previous studies.^{5,18,19}

When it comes to recommending CAM therapies to patients, fourth-year osteopathic medical students were likely to recommend a significantly higher number of CAM modalities, compared with first-year osteopathic medical students. This finding may be explained by the CAM education received during medical school.²⁰ However, osteopathic medical students reported that Internet sites and journals were the main sources of CAM information, and we have no way of knowing whether these sources were used in association with a formal curriculum or self-study. We were not made aware of which COMs had CAM curricula, and most COMs did not reply to a

request for this specific information. Use of a number of CAM modalities was positively associated with the age of the respondents. This finding may have been explained by personal experiences, or it might be the result of a selection bias that alternative (second-career) medical students could have had experience with CAM before entering medical school. Self-reported ethnic group was not significantly correlated with the IMAQ and CHBQ total scale score. Female osteopathic medical students were more positive about CAM than were their male counterparts, and older students were more likely than younger students to have a positive attitude toward CAM. These sex and ethnic group findings were similar to those noted in a similar study.⁹

Among older adults, CAM is widely used for general health maintenance and for management of specific health conditions.^{21,22} The majority of older users of CAM use multiple CAM modalities.^{23,24} Users of CAM have shown high satisfaction with the use of various CAM modalities.^{21,25} Because the US population is aging, the health care needs of individuals who are chronically ill and disabled—conditions that are major stimuli for patients to

Table 3.
Likelihood of Osteopathic Medical Students Suggesting 1 or More Complementary and Alternative Medicine Modalities to a Patient, by Class Year

Modality	First (n=193)	Second (n=172)	Third (n=138)	Fourth (n=132)	Total (N=635)
Biofeedback	32 (16.6)	45 (26.2)	41 (29.7)	52 (39.4)	152 (23.9)
Hypnosis	32 (16.6)	32 (18.6)	26 (18.8)	32 (24.2)	112 (17.6)
Meditation/yoga/relaxation/imagery	107 (55.4)	95 (55.2)	80 (58.0)	82 (62.1)	356 (56.1)
T'ai Chi/Qi Gong	56 (29.0)	43 (25.0)	40 (29.0)	48 (36.4)	178 (28.0)
Traditional Chinese medicine	57 (29.5)	60 (34.9)	50 (36.2)	70 (53.0)	227 (35.7)
Ayurvedic medicine	26 (13.5)	19 (11.0)	20 (14.5)	23 (17.4)	83 (13.0)
Curanderismo	10 (5.2)	11 (6.4)	10 (7.2)	9 (6.8)	35 (5.5)
Chiropractic	54 (28.0)	42 (24.4)	40 (29.0)	44 (33.3)	168 (26.4)
Massage	111 (57.5)	95 (55.2)	82 (59.4)	76 (57.6)	356 (56.1)
Therapeutic touch/Reiki	31 (16.1)	30 (17.4)	24 (17.4)	38 (28.8)	114 (17.9)
Spirituality/prayer	82 (42.5)	84 (48.8)	64 (46.4)	70 (53.0)	288 (45.3)
Herbal/botanical supplements	77 (39.9)	70 (40.7)	57 (41.3)	61 (46.2)	255 (40.2)
Homeopathy	42 (21.8)	31 (18.0)	22 (15.9)	38 (28.8)	127 (20.0)
At least 1 modality suggested	142 (73.6)	137 (79.7)	113 (81.9)	110 (83.3)	502 (79.1)

use CAM—will increase.²⁶ These facts demand that physicians have a high level of knowledge of and a positive attitude toward CAM. For osteopathic medical students, a high level of knowledge of and a positive attitude toward CAM are in line with the demands of older patients. Historically, osteopathic medical students are likely to choose primary care practice.²⁷ Specific knowledge of and positive attitudes toward CAM may prove beneficial to osteopathic medical students in medical practice.^{13,28}

The current study has many limitations. For instance, the low response rate of the students may have caused self-selection bias, which might skew the results. Unfortunately, our response rate is very similar to that reported by other, similar studies of populations of health care pro-

professionals.¹⁰ Furthermore, the present study is a cross-sectional study; hence, it has the shortcomings that are associated with such studies. We may have captured the true collective opinion of the general population of medical students, but this is unknown. Furthermore, we are relying on recall at a given point in time, and attitudes and opinions are malleable with experience. The level of knowledge of and attitudes toward CAM may evolve with changes in exposure to CAM research and other new situations. Thus, results may change over time. The authors did not try to correlate these opinions with the educational curricula at the respective COMs. At the end of the study, we contacted the COMs to request information on the curriculum that is offered at each school; however, only 2 COMs responded

with the requested information. Different CAM curricula at different COMs were not taken into consideration during analysis of the results.

Conclusion

Osteopathic medical students who responded to this survey demonstrated positive attitudes toward CAM and had a high self-reported use of

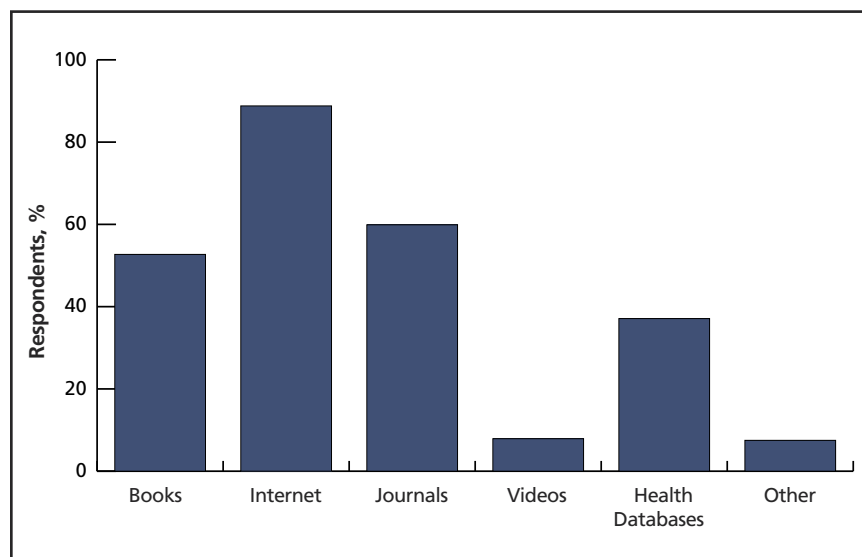


Figure 3. The main sources of information about and education materials for complementary and alternative medicine, as reported by osteopathic medical students (n=606).

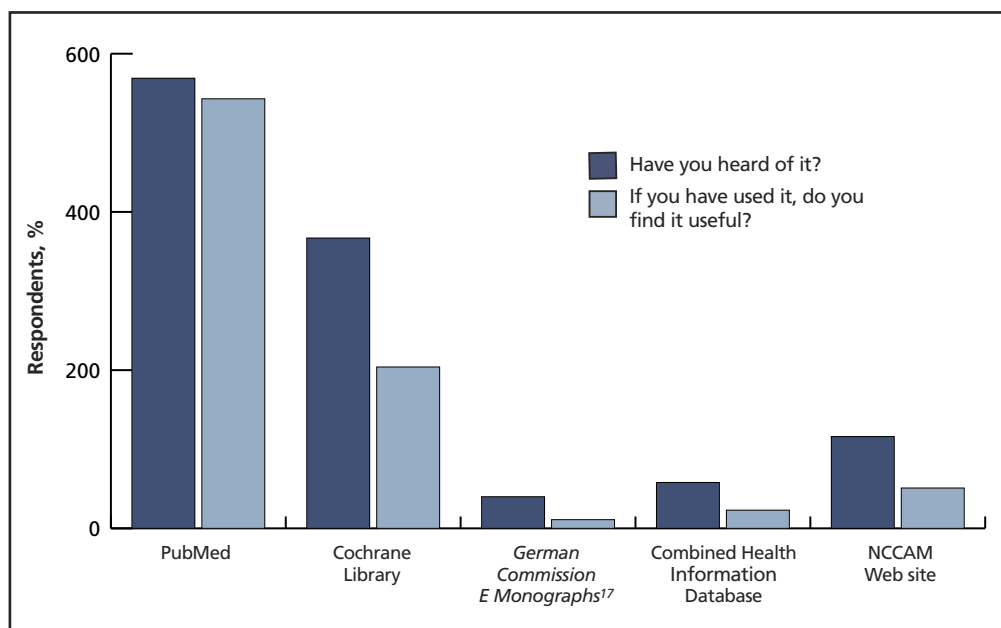


Figure 4. Awareness of various sources of information on complementary and alternative medicine among osteopathic students (n=626). **Abbreviation:** NCCAM, National Center for Complementary and Alternative Medicine.

CAM. Osteopathic medical students who acquire professional training and have personal experience with CAM may be in a better position to discuss CAM with their future patients. Patients seeking out these students as their physicians may benefit from this increased knowledge.

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Table 4.
Response of Osteopathic Medical Students to Integrative Medicine Attitude Questionnaire and Complementary and Alternative Medicine Health Belief Questionnaire Items (N=635)

Item Content	Mean Rating ^a
IMAQ	
1. A patient is healed when the underlying pathological processes are corrected or controlled. ^b	3.10
2. The physician's role is primarily to promote the health and healing of the physical body. ^b	2.60
3. Patients whose physicians are knowledgeable of multiple medical systems and complementary and alternative practices (ie, Chinese, ayurvedic, osteopathic, homeopathic, etc), in addition to conventional medicine, do better than those whose physicians are only familiar with conventional medicine.	5.53
4. Physicians should warn patients to avoid using botanical medicines (herbs) and dietary supplements until they have undergone rigorous testing, such as is required for any pharmaceutical drug. ^b	3.85
5. It is appropriate for physicians to use intuition ("gut feelings") as a major factor in determining appropriate therapies for patients.	3.17
6. The spiritual beliefs and practices of physicians play no important role in healing. ^b	5.07
7. The spiritual beliefs and practices of patients play no important role in healing. ^b	6.11
8. It is irresponsible for physicians to recommend acupuncture to patients with conditions like chemotherapy-related nausea and vomiting or headache. ^b	5.69
9. End-of-life care should be valued as an opportunity for physicians to help patients heal profoundly.	4.86
10. It is not desirable for a physician to take therapeutic advantage of the placebo effect. ^b	5.00
11. Healing is not possible when a disease is incurable. ^b	5.77
12. Physicians knowledgeable of multiple medical systems and complementary and alternative practices (eg, Chinese, ayurvedic, osteopathic, homeopathic), in addition to conventional medicine, generate improved patient satisfaction.	5.67
13. Therapeutic touch has been completely discredited as a healing modality. ^b	5.44
14. Physicians who model a balanced lifestyle (ie, attending to their own health, social, family and spiritual needs, as well as interests beyond medicine) generate improved patient satisfaction.	5.82
15. Quality-of-life measures are of equal importance as disease-specific outcomes in research.	5.79
16. Chiropractic is a valuable method for resolving a wide variety of musculoskeletal problems (beyond back pain).	3.92
17. The physician's role is primarily to treat disease, not to address personal change and growth of patients. ^b	6.03
18. Massage therapy often makes patients "feel" better temporarily, but it does not lead to objective improvement in long-term outcomes for patients. ^b	4.78
19. The innate healing capacity of patients often determines the outcome of the case regardless of treatment interventions.	4.42
20. A strong relationship between patient and physician is an extremely valuable therapeutic intervention that leads to improved outcomes.	6.05

(continued)

^a All items used a 7-point response scale (1, absolutely disagree; 7, absolutely agree)

^b These items were negatively worded, and item responses were reverse scored so higher value indicated greater endorsement.

Abbreviations: CAM, complementary and alternative medicine; CHBQ, CAM health benefit questionnaire; IMAQ, Integrative Medicine Questionnaire.

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(continued)

Table 4 (continued).
Response of Osteopathic Medical Students to Integrative Medicine Attitude Questionnaire and Complementary and Alternative Medicine Health Belief Questionnaire Items (N=635)

Item Content	Mean Rating ^a
IMAQ (continued)	
21. Physicians who strive to understand themselves generate improved patient satisfaction.	5.57
22. Instilling hope in patients is a physician's duty.	4.83
23. Physicians should be prepared to answer a patient's questions regarding the safety, efficacy, and proper usage of commonly used botanical medicines, such as saw palmetto, St. John's wort, valerian, etc.	5.75
24. Counseling on nutrition should be a major role of the physician toward the prevention of chronic disease.	6.21
25. Physicians should avoid recommending botanical medicines on the basis of observations of long-term use in other cultures and systems of healing, because such evidence is not based on large randomized controlled trials. ^b	4.50
26. Osteopathic manipulative therapy is a valuable method for resolving a wide variety of musculoskeletal problems (beyond back pain).	6.28
27. Information obtained by research methods other than randomized controlled trials has little value to physicians. ^b	5.23
28. It is ethical for physicians to recommend therapies to patients that involve the use of subtle energy fields in and around the body for medical purposes (ie, Reiki, healing touch, therapeutic touch, etc).	4.21
29. Physicians who strive to understand themselves provide better care than those who do not.	5.47
CHBQ	
30. Physical health and mental health are maintained by an underlying energy or vital force.	4.16
31. Health and disease are a reflection of balance between positive life-enhancing forces and negative destructive forces.	3.98
32. The body is essentially self-healing, and the task of a health care provider is to assist in the healing process.	5.53
33. A patient's symptoms should be regarded as a manifestation of a general imbalance or dysfunction affecting the whole body.	5.22
34. A patient's expectations, health beliefs, and values should be integrated into the patient care process.	6.13
35. Complementary therapies are a threat to public health. ^b	5.91
36. Treatments not tested in a scientifically recognized manner should be discouraged. ^b	4.66
37. Effects of complementary therapies are usually the result of a placebo effect. ^b	5.03
38. Complementary therapies include ideas and methods from which conventional medicine could benefit.	5.42
39. Most complementary therapies stimulate the body's natural therapeutic powers.	4.65

^a All items used a 7-point response scale (1, absolutely disagree; 7, absolutely agree)

^b These items were negatively worded, and item responses were reverse scored so higher value indicated greater endorsement.

Abbreviations: CAM, complementary and alternative medicine; CHBQ, CAM health benefit questionnaire; IMAQ, Integrative Medicine Questionnaire.