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Alternative Medicine Research in Clinical Practice:

A US National Survey

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Abstract

Background—Little is known about whether federally funded complementary and alternative medicine (CAM) research is translating into clinical practice. We sought to describe the awareness of CAM clinical trials, the ability to interpret research results, the acceptance of research evidence, and the predictors of trial awareness among US clinicians.

Methods—We conducted a cross-sectional mailed survey of 2400 practicing US acupuncturists, naturopaths, internists, and rheumatologists.

Results—A total of 1561 clinicians (65%) responded. Of the respondents, 59% were aware of at least 1 major CAM clinical trial; only 23% were aware of both trials. A minority of acupuncturists (20%), naturopaths (25%), internists (17%), and rheumatologists (33%) were “very confident” in interpreting research results ($P<.001$). Fewer acupuncturists (17%) and naturopaths (24%) than internists (58%) and rheumatologists (74%) rated the results of randomized controlled trials as “very useful” ($P<.001$). Twice as many internists (53%) and rheumatologists (64%) rated patient preferences as “least important” compared with acupuncturists (27%) and naturopaths (31%) ($P<.$

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001). In multivariate analyses, for clinicians aware of at least 1 trial, male sex (odds ratio [OR], 1.30 [95% confidence interval {CI}, 1.05–1.62]), prior research experience (OR, 1.45 [95% CI, 1.13–1.86]), institutional or academic practice setting (ORs, 1.98 [95% CI, 1.01–3.91], and 1.23 [95% CI, 0.73–2.09], respectively), and rating randomized trials as "very useful" (OR, 1.46 [95% CI, 1.12–1.91]) (P<.001) for clinical decision making were positively associated with CAM trial awareness. Acupuncturists, naturopaths, and internists (ORs, 0.15 [95% CI, 0.10–0.23], 0.15 [95% CI, 0.09–0.24], and 0.18 [95% CI, 0.12–0.28], respectively) were all similarly less aware of CAM trial results compared with rheumatologists.

Conclusion—For clinical research in CAM to achieve its social value, concerted efforts must be undertaken to train clinicians and improve the dissemination of research results.

Complementary And Alternative medicines (CAM) are widely used, but until recently there have been few rigorous empirical studies of the safety and efficacy of CAM treatments. In response, the National Institutes of Health (NIH) has invested more than US $2 billion over the past decade to support scientific research on CAM.[1,2] For this investment to achieve its anticipated social value,[3,4] clinical research must be translated into improvements in clinical and public health practice—a process fraught with obstacles.[5,6]

Prior beliefs and attitudes of clinicians toward CAM and CAM research may limit the extent to which they translate new empirical data regarding CAM into their clinical practice.[7–9] Clinicians' practice philosophies, their attitudes regarding the efficacy of CAM therapies, their experience with those therapies, and their judgments regarding the reliability of different information sources all appear to shape their views of CAM.[10–21] There is also evidence that CAM clinicians differ from mainstream clinicians in their attitudes toward the role of research results in clinical decision making.[13,22,23] Still, other factors such as prior training, practice context, and professional norms may all influence the extent to which evidence from CAM research influences clinical practice.

For evidence from clinical research to have an impact on medical practice, health care professionals must first be aware of the research. Once aware, health care professionals must be able to interpret these findings, judging both their validity and their implications. Finally, they must apply the scientific evidence to their own practices.[5] While not directly measuring the clinical impact of CAM research, this study sought to address the following questions regarding the translation of CAM research into the clinical practices of conventional and alternative health care professionals: (1) To what extent are clinicians aware of findings from prominent CAM trials? (2) Do clinicians feel prepared to interpret research results? And (3) how highly do clinician audiences for CAM research value research evidence relative to other factors in clinical decision making? To clarify the obstacles that may hinder CAM research evidence from influencing clinical practice, this study also explored the characteristics, experiences, and attitudes of clinicians that are associated with being aware of CAM research.

METHODS

PARTICIPANTS

We mailed a self-administered, 12-page questionnaire to stratified random samples of 1200 practicing US physicians (600 general internists and 600 rheumatologists) and 1200 licensed US CAM providers (600 acupuncturists and 600 naturopaths). Between May 20 and June 1, 2007, each sampled health care professional received a cover letter, an informational sheet, a letter of support from a relevant professional society, and the questionnaire. After 6 weeks, a second packet was sent to nonrespondents. A $20 incentive accompanied the initial mailing. Among the 2400 health care professionals sampled, 1561 responded (65% response rate): 440 acupuncturists (73%), 442 naturopaths (74%), 334 general internists (56%), and 345

rheumatologists (58%). Among acupuncturists and naturopaths, respondents and nonrespondents did not differ by age or practice setting, but respondents were slightly more likely to report female sex (P =.04). Among rheumatology and internal medicine samples, respondents did not differ from nonrespondents by age, practice setting, or sex.

Physician samples were obtained from the American Medical Association Physician Masterfile—a comprehensive database of US physicians. The CAM provider samples were obtained from national databases of licensed acupuncturists and naturopaths compiled from state boards. Acupuncturists were selected because the NIH funds many clinical trials in acupuncture that might bear on the practices of these CAM providers. Similarly, naturopaths routinely recommend herbs, vitamins, and other dietary supplements commonly studied in NIH trials. At the time the sample was drawn (fall 2006), 13 states licensed naturopathic physicians and 44 states licensed acupuncturists.

Eligibility was defined as holding an active license for the designated profession, current involvement in patient care, and ability to read English. After verifying as many addresses as possible, we sent questionnaires to a random list of 600 eligible health care professionals (without replacement) from each professional group.

QUESTIONNAIRE DEVELOPMENT

We devised measures of health care professional knowledge, attitudes toward and experiences of CAM, and attitudes toward research evidence as follows: (1) We compiled key theoretical constructs from the literature and explored those constructs in focus groups using a semistructured moderator's guide devised and implemented by an experienced social scientist and coinvestigator (B.C.). (2) A convenience sample of health care professionals participated in two 90-minute focus groups—one for alternative health care professionals (4 naturopaths and 5 acupuncturists) and one for conventional health care professionals (2 rheumatologists and 4 general internists). (3) Videotaped group interactions and observer notes were analyzed, and themes were used to revise a draft survey instrument. (4) Eight additional health care professionals (2 internists, 2 rheumatologists, 3 acupuncturists, and 1 naturopath) completed the revised survey instrument and participated in a 90-minute, face-to-face cognitive interview to further clarify the questionnaire. (5) We then revised the survey based on these interviews. (6) Finally, we conducted a pretest of 40 health care professionals (10 from each respective professional group) to get rough estimates of group response (21 responded), to test usability, to check initial distributions, and to obtain participant comments that might indicate problems.

The final questionnaire included the following 5 domains: (1) participant characteristics, (2) experience with research and CAM therapies, (3) awareness of CAM trials, (4) acceptance of research evidence, and (5) factors that influence judgments about hypothetical studies.

DEPENDENT VARIABLE

Because awareness is an absolutely necessary first step in translating research evidence into improved health outcomes,5 awareness of CAM trials was our primary dependent variable. Rather than asking general questions about familiarity with CAM research that may be vague and especially susceptible to social desirability, we asked respondents about their awareness of 2 specific prominent CAM studies. Between 2004 and 2006, 2 landmark, high-profile CAM studies were published that evaluated CAM modalities, which formed the basis for evaluating respondent awareness of CAM research.[24,25] We asked participants to read summaries of the 2 clinical trials that studied the use of CAM modalities for osteoarthritis of the knee. The first study, a randomized controlled trial (RCT) comparing adjunctive acupuncture with sham acupuncture for osteoarthritis of the knee, was published in the *Annals of Internal Medicine* in 2004.[24] That study found that acupuncture was superior to educational control for improving

standardized measures of pain and function. The second study, a double-blind RCT of glucosamine with and without chondroitin, was published in the *New England Journal of Medicine* in 2006.[25] That study found no benefit over placebo for the primary outcome. However, in a secondary analysis the investigators found that the glucosamine-chondroitin combination was superior to placebo for participants with moderate to severe disease. With respect to each study, survey participants indicated whether they were familiar with the trial, whether the trials' findings were consistent with their clinical experience, and whether they had changed their practices in light of the trial's results. In subsequent analyses, we operationalized awareness of CAM trials in 2 ways: familiarity with at least 1 of the 2 studies or familiarity with both studies.

INDEPENDENT VARIABLES

Respondents' ability to interpret research results was measured according to their confidence in interpreting research results in general (very confident, moderately confident, not very confident, or not at all confident).

We also measured health care professionals' acceptance of research evidence in general (not related to CAM research specifically). Clinical experience, research results, and patient preferences are all legitimate considerations for clinical decisions.[26] However, to generate an indirect measure of the extent to which health care professionals are inclined to accept new scientific evidence as relevant for their clinical decisions, we asked participants to indicate the overall importance and relative role of each factor in their clinical decisions. Participants also rated the overall clinical usefulness of published results from RCTs.

Respondents reported their demographic information, practice characteristics, and their participation in any of the following 6 research activities: enrolled patients in a clinical study, been a coinvestigator, been a principal investigator, been a reviewer for a journal, designed a study, or served on an institutional review board. To measure respondents' experiences with CAM, we asked them to indicate whether they had ever recommended each of the following: spinal manipulation (eg, chiropractic), acupuncture, energy medicine (eg, Reiki), meditation practices (eg, yoga), glucosamine ± chondroitin, and body work (eg, massage and Shiatsu). These types of CAM therapies are commonly used for musculoskeletal conditions and correspond to a spectrum of CAM treatment categories as defined by the NIH.[27]

HUMAN SUBJECTS APPROVAL

This study was approved by the Office of Human Subjects Research of the National Institutes of Health and by the institutional review board of the University of Massachusetts–Boston. A cover letter outlined the voluntary nature of participation; a returned questionnaire was considered documentation of informed consent.

DATA MANAGEMENT AND STATISTICAL ANALYSIS

All data were double entered and 100% verified. In unadjusted bivariate comparisons of professional groups, we performed Pearson χ^2 tests for categorical variables and unpaired, 2-tailed *t* tests for continuous variables. Unless otherwise specified, responses to ordered categorical variables were dichotomized based on the distribution characteristics of responses. Then, 2 basic logistic regression models that included independent variables of age, sex, race, geographic region, practice setting, professional group, and research experience and variables indicating whether a clinician had recommended acupuncture or glucosamine were constructed using awareness of 1 CAM trial or awareness of both CAM trials, respectively, as the dependent variable. Then, because individual variables measuring attitudes toward evidence in clinical practice were highly correlated, these variable were tested in the base models individually to determine independent associations. All regression models used Hosmer-Lemeshow

goodness-of-fit tests, which tests for low model fit. All analyses were performed with STATA Intercooled 8.0 (Stata-Corp, College Station, Texas) statistical software.

RESULTS

Of the 2400 clinicians who were sent questionnaires, 1561 responded (65%). Professional groups varied considerably in their personal and professional characteristics (Table1). A higher proportion of acupuncturists(28%)reported being Asian. Acupuncturists (63%) and naturopaths (63%) were more likely to be women, and a much higher proportion of rheumatologists reported having an academic practice setting(20%).Acupuncturists and naturopaths were more likely to be from the western region of the United States.

Experience in conducting research and recommending CAM modalities also varied widely (Table 2). Acupuncturists were the least likely to report personal experience in research (25%), followed by naturopaths (32%), general internists (46%), and rheumatologists (77%). A majority of respondents in all professional groups reported having recommended each of the listed CAM therapies except energy medicine, which few internists or rheumatologists (7% and 7%, respectively) had recommended.

AWARENESS OF CAM TRIALS

There was wide variation in respondent awareness of the 2 presented CAM trials within and across professional groups (Table 3). Among all health care professionals, 37% were aware of the acupuncture trial published in the *Annals of Internal Medicine* in 2004[24] and half (49%) were aware of the glucosamine trial published in the *New England Journal of Medicine* in 2006.[25]

Acupuncturists (46%) and rheumatologists (49%) were more likely to be aware of the acupuncture study than were naturopaths (30%) and general internists (22%). Among those who were aware, a modest proportion of clinicians, ranging from 19% (acupuncturists) to 30% (rheumatologists), reported changing their practice based on the study results among the 4 professional groups.

Internists (59%) and rheumatologists (88%) were much more likely to be aware of the glucosamine study than were acupuncturists (20%) and naturopaths (39%). Among those who were aware of this study, slightly greater proportions of respondents in the professional groups reported changing their practice based on the study results, ranging from 22% to 51%. Overall, 59% of all respondents (88% of rheumatologists, 60% of internists, 47% of naturopaths, and 48% of acupuncturists) were aware of at least 1 of the studies. Only 23% were aware of both trials (45% of rheumatologists, 17% of internists, 20% of naturopaths, and 15% of acupuncturists).

ABILITY TO INTERPRET RESEARCH RESULTS

A minority of respondents in all professional groups expressed the highest level of confidence in their ability to interpret research results; 20% of acupuncturists, 25% of naturopaths, 17% of internists, and 33% of rheumatologists were “very confident” in their ability to critically interpret research literature. A majority of respondents in all groups described themselves as “moderately confident,” including 59% of acupuncturists, 64% of naturopaths, 67% of internists, and 59% of rheumatologists (Table 3).

ACCEPTANCE OF RESEARCH EVIDENCE

With respect to the relative importance of different considerations in clinical decision making (clinical experience, patient preferences, and research results),we found that most respondents

in all groups said that clinical experience is “very important” (Table4). Physicians were more than twice as likely as CAM providers to say research was “very important,” while CAM providers were more likely to say that patient preferences were “very important.” Moreover, physicians were 3 times more likely to rate results of RCTs as “very useful” than were CAM providers (most of the latter rated RCTs as “moderately useful”) (Table 4).

This same pattern emerged in participants’ rankings of the most and least important factors in their decision making. A majority of acupuncturists (79%) and naturopaths (81%) rated clinical experience as “most important,” whereas internists and rheumatologists were more evenly divided between those who rated clinical experience (50% each) and published research (37% and 43%, respectively) as the most important factor. Conversely, two-thirds of acupuncturists and naturopaths rated published research as “least important” (70% and 66%, respectively), while a majority of internists and rheumatologists rated patient preferences as “least important” (53% and 64%, respectively).

After controlling for age, sex, race, census region, and practice setting, being in the rheumatology professional group was independently associated with ratings of the importance of patient preferences (rating of patient preferences as “very important,” odds ratio [OR], 0.59 [95% confidence interval {CI}, 0.41–.85]).A similar pattern emerged with rating patient preferences as “least important.” In that analysis, after controlling for age, sex, race, census region, and practice setting, internal medicine and rheumatology specialties were both independently associated with rating patient preferences as least important(OR,2.76[95%CI, 1.93–3.94], and OR, 4.03 [95% CI, 2.76–5.89], respectively).

ASSOCIATIONS WITH CAM TRIAL AWARENESS

In analyses using pooled unadjusted data from the 4 professional groups, we found that those who reported male sex, any research experience, being “very confident” in their ability to interpret research results, or having strong, favorable opinions about the role of research in their practice were all more likely to be aware of CAM trials (Table 5). In addition, awareness of CAM trials varied by professional group, practice setting, and region. For instance, higher proportions of rheumatologists, those with an academic or institutional practice setting, and those from the Northeast or Midwest regions reported being aware of CAM trials. In contrast, lower proportions of acupuncturists, those in solo practice, and those from the West region reported being aware of CAM trials (Table 5).

Multivariate analyses showed that several characteristics and attitudes were independently associated with greater CAM trial awareness (Table 5). These included male sex (OR, 1.30 [95% CI, 1.05–1.62]), institutional practice setting (OR, 1.98 [95% CI, 1.01–3.91]), having research experience (OR, 1.45 [95% CI, 1.13–1.86]), and greater acceptance of evidence (rating of research as “very important,” OR, 1.40 [95% CI, 1.09–1.80]) (Table 5). Those with moderate or slight confidence in interpreting research results were less likely to be aware of CAM trials (ORs, 0.69 [95% CI, 0.52–0.93] and 0.53 [95% CI, 0.36–0.79], respectively). Acupuncturists, naturopaths, and internists (ORs, 0.15 [95% CI, 0.10–0.23], 0.15 [95% CI, 0.09–0.24], and 0.18 [95% CI, 0.12–0.28], respectively) were much less aware of CAM trial results than rheumatologists. In a second model using awareness of both CAM trials as the dependent variable, most associations remained the same; however, sex was not significantly associated with CAM trial awareness (OR, 1.29 [95% CI, 0.96–1.60]), but practicing in an academic setting was associated with being aware of both CAM trials (OR, 1.96 [95% CI, 1.22–3.15]). The *P* value of Hosmer-Lemeshow goodness-of-fit test to examine poor fit for the basic regression model (without attitudinal variables) was not significant (*P*=.44) and remained nonsignificant for subsequent models (including attitudinal variables) (*P* values ranged from . 70 to .98), suggesting reasonable model fit.

COMMENT

In this national survey of 1561 conventional and CAM health care professionals, half said that they were aware of at least 1 of the 2 CAM trials presented, but only 1 in 4 was aware of both studies. Few clinicians were very confident in interpreting research results. Compared with those who were not aware of CAM trials, clinicians who were aware of CAM trials were much more likely to be rheumatologists, to be practicing in an institutional or academic setting, to have some research experience, to express greater ability to interpret evidence, and to report greater acceptance of evidence.

These results suggest that the ultimate clinical impact of clinical research in CAM likely depends on the training, attitudes, and experiences of the clinicians who could translate research results into clinical practice. For instance, CAM providers expressed much less research experience and less regard for trial results in their clinical decision making compared with their conventional colleagues, and they were also less aware of CAM trial results. In contrast, internists reported an intermediate level of research experience and very favorable regard for the role of research evidence in their practice, but they were no more aware of CAM trial results than their CAM counterparts. In contrast, clinicians who believe that they can make sense of research results may pay more attention to those results. Rheumatologists on average spend more time training and typically participate in research and learn skills of research interpretation during fellow-ship training. These experiences may confer greater confidence in interpreting results and may thereby lead to increased trial awareness.

Similarly, health care professionals must believe that scientific research is useful before they will be motivated to learn about it and accept it. Less than one-third of CAM providers indicated the highest level of regard for research results in their clinical decision making compared with two-thirds of conventional health care professionals. These findings may reflect differences in professional culture regarding what constitutes “evidence” and what makes one kind of evidence more dependable than another. Physicians may feel increasingly compelled to say that they practice “evidence-based medicine,” stressing measurable population-based health outcomes. [13,28,29] Providers of CAM may conceive of “evidence” in broader terms—including their own clinical experience—and place less emphasis on population-based empirical data. [28,29] In turn, it appears that CAM providers may emphasize patient preferences more in their clinical decision making compared with their conventional colleagues.

Despite the differences, all professional groups cite clinical experience as central to their clinical decision making. [30] To have the maximal impact, evidence from clinical research (appropriately synthesized and graded) must be approached with an open mind and integrated with clinical experience and patient preferences.[26] If clinicians have entrenched views either in favor of or in opposition to a given therapy, it will be difficult for new evidence to refute such preconceived notions.31 Furthermore, scientists must disseminate research evidence in a clinically relevant manner so that clinicians can implement decisions consistent with that evidence.32

This study has several limitations. First, as a cross-sectional survey it does not permit causal inferences. Second, despite our efforts to elicit candid opinions of respondents, the perceived desire to give socially acceptable responses could have differentially biased health care professionals’ responses. Third, self-reported attitudes and experiences may not reflect actual skills and behaviors and may not accurately reflect these clinicians’ views of CAM research in general, since we focused on just 2 studies. Furthermore, the differences in awareness between the 2 trials we asked about may be due to time delays or other factors not captured by this survey. Exactly whether or how respondents changed their practice in response to a clinical trial is also difficult to ascertain by survey. Finally, these results may not generalize to other

conventional or CAM professional specialties. Nevertheless, these data provide an initial examination of the influence CAM research is having on clinical practice and factors that appear to be at play in that process.

In conclusion, data from this large national survey suggest that evidence from CAM research has the potential to make a difference in the practice of a broad range of professional practices, conventional and alternative, so long as health care professionals are aware of that evidence and have the experience, training, and opportunities to apply that evidence in the context of their specific practice. Nevertheless, significant barriers to CAM clinical research awareness exist. For clinical research in CAM (and conventional medicine) to achieve its potential social value, concerted efforts must be undertaken that more deliberately train clinicians in critical appraisal, biostatistics, and use of evidence-based resources, as well as expanded research opportunities, dedicated training experiences, and improved dissemination of research results.

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Table 1

Characteristics of 1561 Clinician Respondents, Shown by Professional Group

Characteristic	Overall, % (N=1561)	Professional Group, %				*P* Value
		CAM Providers		Conventional Health Care Professionals		
		Acupuncturists (n=440)	Naturopaths (n=442)	General Internists (n=334)	Rheumatologists (n=345)	
Age, mean (range), y	49 (29–81)	50 (29–78)	46 (29–81)	49 (31–65)	52 (28–65)	<.001
Female	47	63	63	30	24	<.001
Race						
Asian	15	28	4	19	9	<.001
Black	1	0.5	1	3	1	
White	80	66	93	73	89	
Other	4	5	3	5	1	
Practice setting						
Solo	49	70	61	27	28	<.001
Group	37	23	29	54	46	
Institutional	3	3	3	5	3	
Academic	7	1	3	9	20	
Other	3	2	4	5	2	
Region						
Northeast	22	15	14	24	40	<.001
South	23	23	0.2	35	40	
Midwest	9	8	1	20	12	
West	46	54	85	21	8	

Abbreviation: CAM, complementary and alternative medicine.

Table 2

Experiences With Research and Recommending CAM Therapies Among 1561 Clinician Respondents

		Professional Group, %				
		CAM Providers		Conventional Health Care Professionals		
Variable	Overall,% (N=1561)	Acupuncturists (n=440)	Naturopaths (n=442)	General Internists (n=334)	Rheumatologists (n=345)	*P* Value
Respondents with any research activity	43	25	32	46	77	<.001
Respondents who have recommended CAM therapies						
Spinal manipulation	77	84	96	64	58	<.001
Acupuncture	87	100	98	68	73	<.001
Energy medicine	40	62	70	7	7	<.001
Meditation practices	83	93	97	63	69	<.001
Glucosamine ± chondroitin	87	77	98	90	83	<.001
Body work	87	97	99	74	72	<.001

Abbreviation: CAM, complementary and alternative medicine.

Table 3

Awareness of CAM Clinical Trials and Ability to Interpret Research Results Among 1561 Clinician Respondents, Shown by Professional Group

		Professional Group, %				
		CAM Providers		Conventional Health Care Professionals		
Response Item	Overall, %	Acupuncturists	Naturopaths	General Internists	Rheumatologists	*P* Value
CAM trial awareness						
2004 Acupuncture trial	37	46	30	22	49	<.001
2006 Glucosamine trial	49	20	39	59	88	<.001
Aware of either study	59	48	47	60	88	<.001
Aware of both studies	23	15	20	17	45	<.001
Ability to interpret results						
Very confident	24	20	25	17	33	<.001
Moderately confident	62	59	64	67	59	
Not very confident	13	19	10	15	7	
Not at all confident	1	3	0	1	1	

Abbreviation: CAM, complementary and alternative medicine.

Table 4

Relative Importance of Research Evidence in Clinical Decisions Among 1561 Clinician Respondents, Shown by Professional Group

	Professional Group, %				
	CAM Providers		Conventional Health Care Professionals		
Response Item	Acupuncturists	Naturopaths	General Internists	Rheumatologists	*P* Value
Importance of decision factors					
Clinical experience “very Important”	90	92	74	80	<.001
Published research “very important”	27	30	64	76	<.001
Patient preferences “very important”	58	63	53	43	<.001
Research usefulness					
RCTs are “very useful”	17	24	58	74	<.001
Most important factor					
Clinical experience	79	81	50	50	
Published research	3	5	37	43	<.001
Patient preferences	15	14	12	6	
Least important factor					
Clinical experience	2	3	16	16	
Published research	70	66	31	20	<.001
Patient preferences	27	31	53	64	

Abbreviations: CAM, complementary and alternative medicine; RCTs, randomized controlled trials.

Table 5

Likelihood of CAM Trial Awareness, Stratified by Clinician Characteristics, Experiences, and Attitudes

Covariate	Aware of at Least 1 Trial: % of Respondents	Aware of at Least 1 Trial: Bivariate, *P* Value	Aware of at Least 1 Trial: Multivariate, OR (95% CI)	Aware of Both Trials: % of Respondents	Aware of Both Trials: Bivariate, *P* Value	Aware of Both Trials: Multivariate, OR (95% CI)
Age, y						
<35	55		1 [Reference]	16		1 [Reference]
35–44	59		0.96 (0.59–1.54)	19		1.12 (0.60–2.12)
45–54	60	.75	0.85 (0.54–1.35)	25	.005	1.51 (0.82–2.79)
>55	60		0.64 (0.40–1.05)	28		1.49 (0.79–2.79)
Sex						
Female	52	<.001	1 [Reference]	18	<.001	1 [Reference]
Male	66		1.30 (1.05–1.62)	29		1.29 (0.96–1.60)
Race						
White	59		1 [Reference]	25		1 [Reference]
Asian	63		1.38 (0.98–1.95)	18		0.90 (0.59–1.37)
Black	53	.16	0.94 (0.35–2.55)	16	.11	0.66 (0.18–2.39)
Other	46		0.77 (.42–1.39)	20		1.04 (0.50–2.17)
Professional group						
Acupuncture	48		0.15 (0.10–0.23)	15		0.33 (0.22–0.51)
Naturopathy	47	<.001	0.15 (0.09–0.24)	20	<.001	0.50 (0.31–0.79)
Internal medicine	60		0.18 (0.12–0.28)	17		0.26 (0.18–0.39)
Rheumatology	88		1 [Reference]	46		1 [Reference]
Practice setting						
Solo	52		1 [Reference]	19		1 [Reference]
Group	64	<.001	1.08 (0.83–1.40)	25	<.001	1.26 (0.93–1.70)
Institutional	74		1.98 (1.01–3.91)	33		2.12 (1.11–4.06)

Covariate	Aware of at Least 1 Trial: % of Respondents	Aware of at Least 1 Trial: Bivariate, *P* Value	Aware of at Least 1 Trial: Multivariate, OR (95% CI)	Aware of Both Trials: % of Respondents	Aware of Both Trials: Bivariate, *P* Value	Aware of Both Trials: Multivariate, OR (95% CI)
Academic	77		1.23 (0.73–2.09)	42		1.96 (1.22–3.15)
Other	57		1.12 (0.60–2.11)	23		1.35 (0.65–2.81)
Census region						
Northeast	69		1 [Reference]	29		1 [Reference]
South	65	<.001	0.77 (0.54–1.10)	30	<.001	1.21 (0.84–1.75)
Midwest	69		1.02 (0.64–1.62)	24		1.00 (0.60–1.65)
West	49		0.76 (0.55–1.05)	18		0.89 (0.61–1.31)
Recommended acupuncture						
No	69	.003	1 [Reference]	22	.07	1 [Reference]
Yes	57		1.05 (0.91–1.21)	24		1.09 (0.93–1.29)
Recommended glucosamine therapy						
No	53	.08	1 [Reference]	14	.004	1 [Reference]
Yes	60		1.03 (0.93–1.14)	25		0.93 (0.80–1.08)
Research experience						
None	51	<.001	1 [Reference]	16	<.001	1 [Reference]
Any	71		1.45 (1.13–1.86)	33		1.63 (1.22–2.17)
Ability to interpret results						
Very confident	68		1 [Reference]	34		1 [Reference]
Moderately confident	59	<.001	0.69 (0.52–0.93)	23	<.001	0.67 (0.50–0.89)
Not very confident	49		0.53 (0.36–0.79)	11		0.30 (0.18–0.52)
Not at all confident	32		0.20 (0.06–0.59)	0		NR[a]
Acceptance of evidence						
Research is “very important”						
No	51	<.001	1 [Reference]	18	<.001	1 [Reference]
Yes	69		1.40 (1.09–1.80)	31		1.43 (1.07–1.90)
Research is most important						

Covariate	Aware of at Least 1 Trial: % of Respondents	Aware of at Least 1 Trial: Bivariate, *P* Value	Aware of at Least 1 Trial: Multivariate, OR (95% CI)	Aware of Both Trials: % of Respondents	Aware of Both Trials: Bivariate, *P* Value	Aware of Both Trials: Multivariate, OR (95% CI)
No	55	<.001	1 [Reference]	21	<.001	1 [Reference]
Yes	76		1.46 (1.02–2.07)	35		1.49 (1.06–2.08)
Research is least important						
No	66	<.001	1 [Reference]	28	<.001	1 [Reference]
Yes	52		0.89 (0.69–1.15)	18		0.82 (0.61–1.11)
RCTs are “very useful”						
No	51	<.001	1 [Reference]	18	<.001	1 [Reference]
Yes	72		1.46 (1.12–1.91)	32		1.51 (1.12–2.03)

Abbreviations: CAM, complementary and alternative medicine; CI, confidence interval; NR, not reported; OR, odds ratio; RCTs, randomized controlled trials.

[a]Too few observations to determine an OR from logistic regression.