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### Authors

Milden, Susan P

Stokols, Daniel

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# Physicians' Attitudes and Practices Regarding Complementary and Alternative Medicine

Susan P. Milden, BA; Daniel Stokols, PhD

*This article offers a review of the research literature on complementary and alternative medicine (CAM) and presents the findings from an exploratory survey of the beliefs, attitudes, intentions, and behaviors of conventionally trained physicians toward CAM. Earlier studies of CAM focused primarily on patients' attitudes and behaviors rather than those of physicians. Physicians play a crucial role in moderating patients' beliefs about and use of CAM treatments. Accordingly, this study focused on physicians' knowledge of medical efficacy and their impressions of CAM treatments. The findings from a survey mailed to a random sample of California physicians revealed that physicians' use or recommendations of CAM in their practices are limited by concerns about medical professional norms, yet are positively associated with their use of computer technology for self-education and communication with peers. Sixty-one percent of physicians do not feel sufficiently knowledgeable about CAM safety or efficacy, and 81% would like to receive more education on CAM modalities. The findings raise important issues for medical education and patient care.*

**Index Terms:** *beliefs, behaviors, complementary and alternative medicine (CAM), intentions, physicians' attitudes*

Patient attitudes toward medical care in the United States have shifted away from relying solely on traditional Western<sup>1</sup> medicine. Although not entirely willing to abandon their primary care physician and conventional biomedical treatments, many patients are no longer satisfied with merely being diagnosed and medicated or exposed to invasive and potentially unnecessary surgeries. In some cases, suspicious of or dissatisfied with traditional medicine's inability to alleviate symptoms (especially those associated with chronic illness), Americans have sought to supplement or replace treatments provided by their primary care physicians with new healing modalities they believe will provide a higher level of physical health and well-being.<sup>1,2</sup>

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*Ms Milden and Dr Stokols are with the School of Social Ecology, University of California, Irvine.*

## DEFINITION AND HISTORY OF CAM

Eisenberg and colleagues<sup>3</sup> defined complementary and alternative medical (CAM) therapies as "interventions neither taught widely in medical schools, nor generally available in U.S. hospitals." (p246) Their follow-up trend analysis<sup>4</sup> reported that patient use of CAM had risen from 34% in 1990 to more than 47% in 1997, even though CAM treatments are not widely taught or available. This increase was due primarily to an increase in the number of people seeking CAM, as opposed to the same people using additional treatments. Americans now spend more than \$27 billion each year out-of-pocket for CAM treatments, up from \$14 billion in 1993,<sup>4</sup> clearly expressing a change in their healthcare preferences.

Although patients increasingly use CAM to supplement conventional medical treatment, a discrepancy exists between patient and physician reports of conventional physician

inquiry into CAM use.<sup>4-7</sup> Furthermore, because many physicians have little or no training in CAM modalities, they often dismiss them as being ineffective or unsafe. Despite some physicians' dismissive stance toward CAM treatments, patients continue to use them for the purposes of illness prevention, nutritional supplementation, enhancement of well-being, and personal empowerment,<sup>8</sup> while often remaining unaware of potentially dangerous contradictions.

### WHO USES CAM?

Eisenberg and colleagues<sup>3</sup> nationally representative survey, published in 1993, is regarded as a landmark study that revealed the prevalence, patterns of use, and costs of CAM. By 1997, 47% of the US population used some form of CAM,<sup>4</sup> and visits to CAM providers outnumbered the total number of visits to primary care physicians. Similar usage of CAM was found across all socioeconomic groups, although current indicators suggest greater CAM use among females and those with higher education, higher income, poorer health,<sup>3</sup> transformational (spiritual) experiences, and commitment to personal control.<sup>8</sup>

The reported prevalence of CAM use depends on the specific criteria used to define CAM.<sup>3-5,9</sup> The majority of CAM treatments are used to treat chronic illnesses.<sup>4,10-12</sup> A correlation does exist between the lack of perceived emotional support from conventional physicians and patients' increased interest in CAM.<sup>13</sup> Patient willingness to take risks also is correlated with CAM use.<sup>14</sup> Astin<sup>8</sup> found that dissatisfaction with conventional medical care was not a predictor of CAM use. Eisenberg and colleagues<sup>5</sup> findings support Astin<sup>8</sup> and indicate that patients are mainly concerned with their primary care physician's ability to understand CAM treatments when used in combination with their conventional treatments.

### WHAT TYPES OF CAM ARE USED MOST OFTEN?

Complementary therapies (those used to supplement conventional treatment) are used more often than alternative therapies, particularly among patients with serious illness.<sup>13,15,16</sup> In studies that examine CAM treatments used by individuals with breast cancer, melanoma, and colorectal cancer, for example, the highest use of CAM therapies (greater than 40% responding) were complementary in nature, including spiritual or prayer therapies, vitamin therapy, herbal therapy, massage or physical therapies, and nutrition.

### INSTITUTIONAL TRENDS

Responding to the rise in patients' decisions to use CAM, the National Institutes of Health (NIH) created the Office of Alternative Medicine (OAM) in 1992, eventually renaming it the National Center for Complementary and Alterna-

tive Medicine (NCCAM). The original goal of OAM was to "provide rigorous investigation . . . [and] examine the potential efficacy, effectiveness, safety, and validity of CAM practices, as well as the physiological or psychological mechanisms underlying these practices."<sup>17</sup> The NCCAM has further refined its mission as being dedicated to exploring CAM practices in the context of rigorous science, training CAM researchers, and disseminating authoritative information to the public and professionals.<sup>18</sup> NCCAM Director Stephen Strauss, MD, is optimistic that "CAM will be integrated with conventional medicine as science affords a fuller understanding of its benefits and risks."<sup>19(p25)</sup>

Albeit small by government research standards, Congress increased NCCAM's annual budget for 2002 to \$104.6 million, up \$54 million from 1999, with most of its budget allocated to studies of the efficacy of various CAM treatments.<sup>19</sup> These include the use of shark cartilage for lung cancer, *Ginkgo biloba* to prevent dementia, acupuncture for osteoarthritis, and Ethylenediaminetetraacetic Acid (EDTA) chelation therapy to prevent coronary artery disease.

In 2001, with more than 350 therapies<sup>20</sup> meeting the defining CAM criteria, the NCCAM created 5 generic categories of CAM: (1) Alternative Medical Systems, (2) Mind-Body Interventions, (3) Biologically Based Treatments, (4) Manipulative and Body-Based Methods, and (5) Energy Therapies.<sup>17</sup> Figure 1 provides examples of treatments and methods that fall into each category.

US medical schools also have responded to what has become a consumer driven demand for healthcare. Recognizing that CAM treatments have become part of mainstream self-healthcare, Spiegel et al<sup>21</sup> report that by 1998, at least 27 US medical schools included CAM in their curriculum, although that number is reported by some studies to be as high as 75, collectively;<sup>6</sup> and the number of CAM-accredited programs grew by 90% between 1990 and 2000.<sup>22</sup> Nationwide, student enrollment is up by 35% in chiropractic programs, enrollments in naturopathy programs increased from 319 to 1,523, and enrollments in acupuncture programs tripled.

### WHEN IS CAM NOT CAM?

Although unique for the United States, CAM is the norm for most other nations. The World Health Organization estimates that 80% of the world's population is using some form of CAM for their primary healthcare. Thus, most of the world's population would consider the Westernized form of medicine (allopathic) as "complementary" or "alternative," because it represents a departure from their traditional forms of medicine.<sup>10</sup>

*Alternative Medical Systems*

These are complete systems of medical theory developed independently of Western medicine, in some cases centuries before it.<sup>17</sup>

Examples include:

Traditional Oriental Medicine	Homeopathy
Ayurvedic Medicine	Naturopathy

*Mind-Body Interventions*

Although many mind-body interventions are now considered mainstream, the following are still considered CAM:

Meditation	Music
Hypnosis	Art Therapy
Dance	Prayer

*Biologically Based Treatments*

Examples include:

- Herbal Therapies
- Special Diets believed to control or prevent illness
- Orthomolecular
  - Mega-vitamins and chemicals
- Biological
  - Shark Cartilage to treat cancer
  - Bee Pollen to treat autoimmune diseases

*Manipulative and Body-Based Methods*

Examples include:

- Chiropractic
- Osteopath
- Massage Therapy

*Energy Therapies*

These therapies focus on subtle energy fields\* either within or outside the body, and include:

Qi Gong	Therapeutic Touch (laying on of hands)
Reiki	Magnetic Therapy

\*In some cases these energy fields have not been experimentally proven to exist.

**FIGURE 1. Examples of CAM treatments.**

## TWO HEALING PARADIGMS: WESTERN MEDICINE AND CAM

During the last 100 years, Western medicine has made significant contributions to human health and increased longevity through its empirical approach.<sup>23</sup> These scientific advances have produced state-of-the-art diagnostics, pharmaceuticals, and surgical treatments, all of which are supported by standardized medical training and experimental research.

Any attempt to answer the question, “Why do physicians receive little or no training in CAM modalities?” leads to the philosophical divide that has long separated Western medicine and CAM. The 20th century advances of Western medicine are due in large part to the cultivation of objectivism and the positivist philosophies that embrace the scientific method, a foundation of conventional medical training. These thinking styles, although essential for scientific research, have historically neglected the joint influence of spirit and mind on health and illness. Particularly significant is the relationship between the patient and the physician, because many CAM treatments rely heavily on relationship-centered therapies.<sup>24</sup> Other reasons for the disinterest in some CAM treatments may include the practical matters mentioned by Wynia et al,<sup>25</sup> who suggest that “more important issues took precedence over CAM, such as [in the case of HIV care] anti-retroviral therapy, prophylaxis . . . [and] infections. . . .”<sup>(p454)</sup>

These issues may reflect a struggle over which healing paradigm is superior, and which type of treatment is more important. If the institutions that support the traditional medical paradigm are unwilling to consider a more holistic and complementary approach to healthcare, then physicians interested in CAM treatments must acquire information about them on their own, once they graduate from medical school. For instance, Eisenberg et al<sup>4</sup> and Wynia et al<sup>25</sup> found that practicing physicians may not feel competent to advise patients about the risks and benefits of certain CAM treatments due to a lack of training. Similarly, Pietroni<sup>26</sup> notes: “Some of the methods that fall into these categories [chiropractic, acupuncture, naturopathy] require 4 years of full-time training akin to graduate medical school . . . it is clear that the general practitioner will require guidance before deciding which treatments to include in their primary healing service.”<sup>(pp2-3)</sup> This lack of training and confidence also breeds concerns about legal liabilities (yet another reason cited by some physicians for a reluctance to embrace certain CAM treatments).<sup>25</sup> Some earlier studies suggest that relatively younger physicians, assumed to be recent medical school graduates, are generally more accepting of CAM treatments than their older counterparts,<sup>7,27</sup> despite (or perhaps because of) older physicians’ longer exposure to conventional medical training and practice.

## PREVIOUS STUDIES EXAMINING PATIENT-PHYSICIAN COMMUNICATION

Follow-up studies<sup>8,11,13,16,28</sup> building on Eisenberg’s research examined whether or not patients voluntarily share CAM usage information with their physicians. They also inquired as to whether primary care physicians ask or inform their patients about CAM treatments during a

patient history examination. On the whole, the findings from these studies suggest that physicians should take a more proactive role in ascertaining their patients' actual CAM use.

In surprising contrast to patients' reports that their physicians do not inquire about CAM use,<sup>3</sup> 84% of physicians surveyed by Amster et al<sup>7</sup> indicated that they asked their patients about CAM use during consultations. Those who do not recommend CAM reasoned that they do not know enough about the harm or efficacy of CAM treatments. Although 88% look forward to an integration of CAM with conventional medicine, 69% are cautious of treatments that are not based on biomedicine, and female physicians recommend CAM 16% more often than male physicians. Whereas age (< 46) was found to be significantly associated with CAM use among men only, no significant correlation was evident for ethnicity. Consistent with their high level of interest in patient use of CAM (80%), 92% of all physicians surveyed by Amster et al<sup>7</sup> reported willingness to refer patients for CAM treatment, and 84% reported an interest in attending continuing medical education courses on CAM.

### THE PRESENT STUDY

The existing research literature on CAM suggests the value of more directly investigating physicians' attitudes toward and use of CAM in their medical practice. Therefore, we undertook an exploratory survey study of physicians' (1) attitudes toward their patients' use of CAM, (2) willingness to prescribe or inquire about CAM treatments for their patients, (3) decision to offer or perform CAM treatments as a part of their practice, and (4) consultations of CAM literature and providers, or personal use of CAM treatments. This survey also assessed physicians' self-reported knowledge of medical efficacy and general impressions of approximately 22 CAM modalities and the kinds of technologies, if any, that physicians use in supporting their own level of medical knowledge—CAM or conventional medicine. Finally, the survey examined the levels of research, education, and institutional support that are perceived to be necessary for conventional physicians to feel comfortable supporting the interests of patients in their consideration of CAM treatments and the conditions under which conventionally trained physicians feel confident advising the use of or against the use of a CAM treatment, and the conditions under which they are willing to work in concert with a CAM provider.

The survey design was guided largely by Fishbein and Ajzen's<sup>29</sup> theoretical model of the relationships between individuals' beliefs, attitudes, behavioral intentions, and behav-

ior.<sup>ii</sup> In Fishbein and Ajzen's<sup>29</sup> model, *attitudes* are defined as positive or negative feelings toward particular objects or concepts. *Beliefs* are perceived links between 2 or more concepts or objects. *Behavioral intentions* are statements made by individuals indicating that they plan to enact a particular behavior at some time in the future. Fishbein and Ajzen<sup>29</sup> suggest that although beliefs and attitudes are important, specific behavioral intentions (in this case, intentions to use CAM) are the most reliable predictors of actual (CAM) behaviors. Therefore, the ability to identify which beliefs and attitudes will result in positive intentions is important for predicting actual behavior. Fishbein and Ajzen<sup>29</sup> found, however, that in addition to being causal predictors of intention and behavior, both beliefs and attitudes are themselves subject to normative beliefs about expected or anticipated behavior, thereby promoting greater correspondence between normative expectations (about what behaviors are considered to be appropriate by one's peers or elders) and the individual's actual behavioral intentions. An important implication of this theory, and the hypothesis for the present study, is that physicians' beliefs, attitudes, and behaviors toward CAM are influenced by professional normative beliefs and perceived expectations, including, but not limited to, legal liability concerns, health insurance reimbursement, conventional medical protocol, and patient expectations.

### METHODS

#### Participants

We chose a random sample of 200 California MDs from a list of 56,000 physicians licensed by the California Medical Board. We obtained a CD-ROM containing a database of the licensed physicians from the California Board of Consumer Affairs.<sup>30</sup> We then used a computer to randomize a subset of the database containing only those physicians designated as "active" and included all specialties. We selected the first 200 randomly drawn names to receive the CAM survey.<sup>iii</sup> Once the survey was approved by the University of California Irvine Institutional Review Board, each selected physician received a survey mail packet containing a letter of introduction, a consent letter, a survey, and a self-addressed, stamped return envelope. We asked the participants to return the survey by mail within 3 weeks. Of those initially contacted, 51 physicians filled out and returned the surveys. The average age of physicians was 49 years, with approximately 30% of respondents being women. Seventy-seven percent of all respondents were Caucasian; the remainder identified themselves as African American, Asian, Latino, or Other. Eighty-two percent attended medical school in the United States, and 98% of all respondents were board certified in

their specialty. Only 20% received some form of CAM training in medical school.

### RESPONSE RATE

Of the 200 surveys mailed, the US Post Office returned 4 as undeliverable. Of the 196 surveys delivered, a total of 51 eligible surveys were returned, yielding a response rate of 26%. Of the 51 surveys returned by physicians, we excluded 6 in the statistical analyses because they contained substantially incomplete data. Owing to the lack of respondents' phone numbers, it was not possible to make follow-up phone calls to solicit a higher response rate among nonresponders. Although it is not uncommon for physician response rates on mailed surveys to fall below the 20–25% range because of their busy schedules,<sup>31</sup> response rates in that range pose concerns about potential self-selection and positivity response biases among participants in the study. The exploratory nature of the survey notwithstanding, we made efforts to assess potential response biases by examining the mean, mode, median, minimum, and maximum values on each of the survey items and summary scales. These descriptive statistics revealed marked variation in the CAM-related attitudes, beliefs, behavioral intentions, and practices reported by respondents, suggesting the absence of consistently positive response biases across the different categories of survey measures.

### SURVEY PROCEDURES

We mailed an anonymous self-report survey to physicians during February of 2003.<sup>iv</sup> The survey was 6 pages in length, contained 5 sections, and took approximately 15 minutes to complete. The first page included a brief introduction and definition of CAM, as well as treatment categories and examples. The next section, Physician Orientations, contained a list of 29 questions, inquiring about physician beliefs, attitudes, intentions, knowledge, and behavior toward CAM.<sup>v</sup> We presented these questions as 6-point Likert-type scales, each incorporating 1 of 2 sets of anchors: Strongly Disagree (1), Agree (3), Strongly Agree (5), and Don't Know (6); Never (1), Sometimes (3), Often (5), and Don't Know (6). We did not supply anchor terms for the values 2 and 4 on the Likert-type scales.<sup>vi</sup>

We also presented physicians with 2 open-ended questions and asked them to write in their comments about the integration of CAM with traditional medicine, as well as what CAM resources they thought would be most valuable to them in their practice. Another section of the survey included a list of 22 CAM modalities, categorized into Alternative Medical Systems, Mind-Body Interventions, Biological Treatments, Manipulative Body-Based Methods,

and Energy Therapies. We asked physicians to rank their knowledge of the medical efficacy of the CAM treatments listed on a 1- to 6-point Likert-type scale ranging from Ineffective (1) to Moderately Effective (3) to Very Effective (5) and Don't Know (6). In an effort to crossvalidate the beliefs queried in previous questions, we asked physicians to rate their impressions of the CAM treatments listed on the same Likert-type scale from Very Negative (1) to Neutral (3) to Very Positive (5) and Don't Know (6).

Additionally, the survey incorporated 8 questions on the use of technology in the physicians' medical practices as well as their interest in CAM education. We asked respondents about their use of online databases to obtain peer-review journals for either CAM or traditional medicine. They also were asked about the number of hours per day or week that they spent on the Internet in association with their medical practice, their use of a personal digital assistant (PDA), e-mail, or Web sites to communicate or gather medical data. Some of the questions in the technology and education section were dichotomous, although most were scored on a Likert-type scale ranging from 1 to 5, where 1 = Never, 3 = Sometimes, and 5 = Often.

The final section of the survey assessed demographic information, including age, gender, ethnicity, country of origin, and the country in which the respondent attended medical school. The last page of the survey contained questions asking whether or not respondents had received any CAM training in medical school, the year they graduated from medical school, their number of years in practice, their medical specialty, whether or not they were board certified, whether or not they were a sole practitioner and, if not, with how many MDs they shared a practice or work.

### DATA ANALYSES

We performed Statistical analyses using the SPSS software program (v.11.0). Following initial data entry, survey items were recoded to exclude "Don't Know" answers and missing data. We computed descriptive statistics including mean, mode, minimum, maximum, and standard deviation to identify any data coding anomalies. We computed 2-tailed Pearson bivariate correlations on all variables to identify statistically significant relationships between measures of beliefs, attitudes, intentions, and behaviors, as well as technology and demographic data. We performed a series of multivariate stepwise regression analyses to explore the potential links among key variables (eg, CAM-related attitudes, normative concerns, and behavioral intentions as predictors of physicians' CAM practices). These analyses were highly exploratory in view of the cross-sectional design of the survey and the low response rate noted earlier.

**TABLE 1. Descriptive Statistics for All Composite Indexes**

Composite Index	<i>n</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
Positive CAM Behavior	36	1.9	4.5	2.8	.6
Use of CAM	41	1.2	4.4	2.1	.8
Positive Belief about CAM	30	2.4	4.1	3.2	.5
Positive Attitudes toward CAM	36	2.2	4.7	3.4	.8
Institutional Concerns	38	1.5	6.5	4.1	1.4
Intention to Use CAM	40	1.0	5.0	2.3	1.0
Knowledge of CAM	43	1.0	4.5	2.6	1.0
Efficacy of CAM Treatments	13	2.3	3.9	2.8	.5
Impression of CAM Treatments	9	2.2	3.8	2.8	.5
Use of Technology	45	1.0	4.3	1.9	.9

*Note.* *N* includes only those physicians who answered all of the survey questions included in each summary measure. *Positive CAM Behavior* is a composite of 7 questions designed to assess a physician's current positive behaviors toward CAM. *Use of CAM* is a subset of Positive CAM Behavior and includes 4 questions aggregated separately to assess actual use of recommendation of CAM treatments. *Positive Beliefs about CAM* reflects an aggregate score of 7 questions assessing existing beliefs about CAM. *Institutional Concerns* is a composite of 3 questions designed to assess concern of medical profession norms, potential legal liability, health insurance coverage, etc. *Intention to Use CAM* includes 1 direct intention to use CAM and a subset of 4 belief, attitude, and behavior questions. *Knowledge of CAM* includes a summary of 3 questions examining the physician's own confidence in his or her knowledge of various CAM treatments. *Efficacy and Impression Scales* exclude Energy Therapies. Of the 23 CAM therapies listed on the survey, 4 of them are considered "energy therapies," such as Qi Gong, Reiki, Therapeutic Touch, and Magnetic Therapy. The overwhelming majority of physicians answered "Don't Know" when responding to questions about either the medical efficacy of or their impressions toward Energy Therapies, presumably because of their lack of knowledge, resulting in a relatively low *n* for each of these scales. *Use of Technology* is a composite of the results of 4 questions that assessed the physician's use of technology (e-mail, Web sites, and PDAs), not only as a practice management tool, but also to access or research current medical studies (eg, PUBMED and MEDLINE), as well as to communicate with other healthcare professionals.

### Univariate Measures and Composite Indexes

We incorporated relevant clusters of univariate survey measures into the following composite indexes: Positive CAM Behavior, Use of CAM,<sup>vii</sup> Positive Beliefs About CAM, Positive Attitudes Toward CAM, Institutional Concerns,<sup>viii</sup> Knowledge of CAM, Efficacy of CAM Treatments, Impressions of CAM Treatment, and Use of Technology in Practice. We chose to cluster similar questionnaire items into a smaller number of composite indexes to reduce the likelihood of type I errors (obtaining statistically significant findings by chance) and to increase the ratio of survey respondents to the number of survey items examined in the statistical analyses. For purposes of the analyses, we calculated mean scores (on a 1–5 scale) for each composite index (see Table 1).

## RESULTS

### CAM-Related Beliefs, Attitudes, Intentions and Behaviors

As shown in Table 1, the mean for all respondents on sur-

vey items aimed at identifying positive beliefs toward CAM was 3.2 (1 = most negative and 5 = most positive), indicating slightly better than midrange positive beliefs toward CAM. Similarly, the mean score across those survey items assessing physicians' attitudes toward CAM was 3.4, suggesting a mildly positive reaction to CAM across survey respondents. These slightly positive trends among physicians' beliefs and attitudes toward CAM were in contrast to their more negative responses on survey items designed to assess their current use or intentions to use CAM treatments in the future. For instance, the mean value on the summary scale measuring physicians' intentions to use CAM in their practice was 2.3. Also, the mean value on the summary scale assessing physicians' positive CAM behaviors (eg, their current use or recommendation of CAM treatments in the practices) was 2.8 (where 1 = least positive CAM behavior and 5 = most positive CAM behavior), indicating an overall tendency among survey respondents—even those expressing mildly positive beliefs and attitudes toward CAM—to avoid using such treatments in their practices.

### Knowledge of CAM, Perceived Efficacy of CAM, and Institutional Concerns

Although the composite index of physicians' CAM knowledge yielded a mean score of 2.6, their mean ratings of CAM efficacy (2.8) and general impressions (2.8) of 22 different CAM treatments were skewed by the fact that 36 out of 45 respondents answered "Don't Know" (see Table 1). The incomplete data on these treatment-specific ratings reflected the fact that most participants were unfamiliar with many CAM therapies (such as Ayurvedic Medicine, shark cartilage and bee pollen treatments, Qi Gong, Reiki, magnetic therapy, etc). This general unfamiliarity with several CAM treatments may account for physicians' relatively high scores on the summary index of Institutional Concerns. The mean score of 4.1 on this index suggests that respondents are very concerned about issues such as legal liability, CAM licensure, and the lack of health insurance coverage for CAM treatments. Physicians' use of technology in their medical practice (eg, use of e-mail, the Internet, and PDAs to retrieve or communicate either conventional or CAM data) yielded a mean score of 1.9, suggesting that, among these respondents, computer technology does not serve as a major vehicle for their delivery of healthcare services.

### Bivariate Correlation Results

We found a significant correlation between intention to use CAM and positive attitudes toward CAM,  $r(31) = .813, p < .000$ . Additionally, we found stated intentions to use CAM to be significantly correlated with positive CAM behaviors,  $r(32) = .483, p < .004$ , and physicians' CAM-related attitudes likewise were significantly correlated with CAM practices,  $r(31) = .528, p < .002$ . Intention to use CAM in one's practice was inversely correlated with physicians' years in practice (and with their age),  $r(37) = -.374, p < .021$ . Although only a small number of respondents (9) indicated that they received some form of CAM training in medical school, belief or knowledge of medical efficacy of CAM treatments was significantly correlated with CAM training received in medical school,  $r(8) = .768, p < .016$ . We found physicians' institutional (normative) concerns about non-traditional medical practices to be negatively correlated with their positive beliefs toward CAM,  $r(28) = -.486, p < .007$ .

### Regression Analyses

When we controlled for age, gender, ethnicity, and years in practice, multivariate regression analyses revealed a significant inverse correlation between age and positive CAM behavior ( $R^2 = .347, p < .05$ ), suggesting that approximately 35% of the variance in explaining non-CAM behavior is due to physicians' older ages. In recalculation of the regres-

sion, we included both technology and attitudes as stepwise variables while we controlled for age, gender, ethnicity, and years in practice, and we found technology use to be a more significant predictor of positive CAM behavior ( $R^2 = .610, p < .05$ ) than attitudes toward CAM.

### Physicians' Responses to Open-Ended Questions

Among those physicians who chose to answer the open-ended questions soliciting their comments, suggestions, or concerns regarding the incorporation of CAM treatments into traditional medicine ( $n = 22$ ), the following quotes reflect a generally positive stance toward the integration of CAM and biomedical therapies:

"I believe in the biopsychosocial model. The biomolecular model works best with pathological states, but allows for CAM integration."

"I think CAM and Western Medicine complement each other. The integration of CAM in a systematic and scientifically rigorous manner is essential."

"High quality objective research is very badly needed . . . CAM needs to be evidence based to become fully acceptable."

"There is a well established scientific method to research the efficacy of medications (traditional or otherwise). Not to apply this test to all products and medications is archaic thinking."

## DISCUSSION

Americans' use of CAM therapies is on the rise. Historically, patients have looked solely to their primary care physicians for medical treatment and advice. During the past decade, however, patients have begun to take a more proactive role regarding their own health and well-being. Therefore, the ability of patients to discuss both traditional and alternative treatments with their physicians is becoming increasingly important. Accordingly, the provision of adequate information and education regarding CAM practices and their efficacy has become essential for both patients and physicians.

Although there is disagreement across both patient and physician studies as to how often physicians ask their patients about CAM use, this study found that 76% of physicians responding to the survey do so. Whereas the majority (61%) of physicians surveyed find themselves discouraging CAM therapies because they are not knowledgeable enough about the safety or efficacy of CAM treatments, 81% also claim to want more CAM education. Perhaps because they have not yet received CAM education, 80% of the respondents in this study would prefer to rely solely on conventional biomedical treatments. A qualitative analysis of the open-ended comments provided by almost half of the physicians reveals their general openness toward CAM, provided



that sufficient clinical trials, education, and resources to support CAM practices are made available. Respondents' lack of familiarity about certain CAM techniques (eg, energy therapies; see Table 1) may partly explain the observed bias among respondents against using CAM practices with which they are unfamiliar and whose therapeutic validity they believe remains untested or unknown.

Physicians are more willing to use online databases such as PUBMED or MEDLINE to search out peer-reviewed articles on either CAM or conventional medicine (42%) than they are to search conventional medical Web sites (36%). As noted earlier, physicians' use of technology is a significant correlate of their willingness to use CAM.

Physicians who had been in practice the longest (and were therefore presumably older) expressed the most opposition to CAM,  $r(37) = -.374, p < .021$ . Both their lack of CAM training, as well as the length of time they had been influenced by the institutional norms that historically have resisted CAM, may explain their opposition. This study further indicates that gender was neither significantly correlated with nor predictive of positive CAM beliefs, attitudes, or behaviors.

Physicians holding positive attitudes toward CAM are significantly more likely to express positive behavioral intentions to use CAM,  $r(31) = .813, p < .000$ . However, consistent with Fishbein and Ajzen's<sup>29</sup> theory that social norms can override beliefs, attitudes, and intentions (thereby inhibiting attitudinally-consistent behavior), the findings from this study suggest that physicians' institutional concerns about non-traditional medical treatments significantly influence their willingness to use CAM regardless of their positive beliefs, attitudes, and intentions toward CAM,  $r(28) = -.486, p < .007$ .

Through their responses on both the scaled and open-ended survey items, physicians expressed their desire for greater access to information derived from CAM clinical trials and educational opportunities related to CAM treatments. The results of this study, however, suggest that although positive beliefs toward CAM efficacy are positively correlated with CAM training, institutional concerns diminish actual adoption of CAM practices.

### Contributions and Limitations of This Study

One contribution of this exploratory study is that it focused explicitly on physicians' CAM-related attitudes, beliefs, intentions, and behaviors, whereas prior studies focused primarily on patients' perception and use of CAM. This focus on physician respondents is valuable, considering that medical doctors play a major role in influencing the healthcare decisions of their patients. Second, we grounded the physician survey used in this study in a widely tested conceptual

model of attitude change and behavior, namely, Fishbein and Ajzen's<sup>29</sup> theory of the relationships among individuals' attitudes, beliefs, behavioral intentions, and actual practices. Thus, we designed the survey to examine (albeit in exploratory fashion) certain hypotheses derived from this theory, including the predicted and observed influence of normative beliefs on actual and intended CAM behaviors and the strong association between behavioral intentions and CAM practices. Third, we randomly selected the participants in this study from a statewide listing of all California physicians and medical specialties. Although we drew the sample randomly from only 1 state, California is the most populous (and one of the most culturally diverse) state in the United States and often serves as a bellweather for emerging sociocultural, demographic, and public health trends.

The methodological limitations of this study include: (1) the low response rate (26%) obtained; (2) the cross-sectional rather than longitudinal research design which precludes causal inferences from the descriptive, correlational, and exploratory regression analyses; and (3) the lack of supplemental data provided by nonrespondents that might be used to corroborate participants' self-reports—for example, surveys of nurses or other professional associates who are in a position to report on a physician's CAM practices.

The strengths and limitations of this study must be weighed together to assess its contribution to the research literature on behavioral medicine and CAM. For instance, a low response rate on surveys may result in self-selection and response biases that cloud the interpretation of data. Among the physicians participating in this study, we did find mild trends toward positivity in their attitudes and beliefs about CAM. However, these trends were in contrast to participants' tendencies to avoid using CAM treatments in their medical practices. In the context of these contrasting attitudinal and behavioral trends, it was possible to identify the potentially important role of professional norms regarding the efficacy of CAM in discouraging the use of CAM treatments by conventionally trained physicians. The opportunity to assess theoretically derived hypotheses regarding physicians' CAM-related attitudes, beliefs, behavioral intentions, and medical practices (issues that have received little attention in behavioral medicine research previously) may offset, at least in part, limitations placed on the representativeness of these findings California physicians, let alone those practicing in other states, because of the cross-sectional design and sampling constraints of the study.

### CONCLUSIONS

The results of this exploratory survey study must be interpreted and generalized cautiously because of the limitations

noted earlier. Longitudinal survey designs examining physician beliefs, attitudes, and behaviors at repeated intervals (for example, both before and after exposure to CAM training), the incorporation of larger survey samples, and the use of observational (as well as self-report) measures of physicians' CAM practices remain priorities for future research in this area.

Western medicine has made tremendous strides toward improving human health and longevity over the past century. A new era in healthcare has emerged, which demands that Western medicine empirically evaluate and possibly integrate healing concepts that, initially, may appear to be alien to a traditional medical paradigm. The definition of what both physicians and patients consider as CAM is changing as more CAM treatments come to be viewed as mainstream. In the meantime, it is important that physicians continue to be open to the CAM modalities that remain outside the traditional medical model of allopathic medicine. Willingness to consider the whole person (body, mind, and spirit) as well as their environment is an important first step toward achieving more comprehensive and effective approaches to medical education and healthcare delivery.

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#### NOTES

For comment and further information, please address correspondence to Susan Mildren or to Dan Stokols, Department of Planning, Policy, and Design, School of Social Ecology, Room 206-C SE I Building, University of California, Irvine, Irvine CA 92696-7075 (email: smildren@uci.edu or dstokols@uci.edu).

i. The terms Western medicine, conventional medicine, and biomedicine are used interchangeably within this article and refer specifically to the mainstream medical care available in the United States.

ii. The Fishbein and Ajzen model<sup>29</sup> is one of several alternative theories that might be used to explain the consistencies between physicians' CAM-related attitudes and behavior. We chose to emphasize their model because it emphasizes the importance of individuals' stated intentions to behave in a particular manner as a reliable predictor of their subsequent behavior and because the predicted relationships between behavioral intentions and actual behavior have been found in several earlier studies.

iii. Prior to mailing the final survey form to physicians, we conducted a pilot survey to assess the clarity of the CAM survey items. We administered 12 pilot surveys to physicians based in Orange County, California. We identified physicians as prospective participants for the survey on the basis of their willingness to participate. We encouraged participants to make suggestions on the survey and

to complete and return it within 10 days. Eight completed pilot surveys were returned and used as a basis for refining the final survey items.

iv. Although no compensation was offered for participation in this study, physicians were given the opportunity to request and receive a copy of the survey results. If they wished to remain anonymous, we asked participants to submit an e-mail request to [camsurvey@uci.edu](mailto:camsurvey@uci.edu) for a summary of the findings.

v. We scored questions 1 through 21 on a 1- to 6-point Likert-type scale ranging from Strongly Disagree (1) to Strongly Agree (5), and Don't Know (6). We scored questions 22 through 29 on a 1- to 6-point Likert-type scale of Never (1) to Often (5).

vi. Examples of the questions survey included: (1) *Beliefs*: "In some cases I consider CAM treatments to be superior to traditional medical protocols"; (2) *Attitudes*: "I find myself annoyed when my patients bring me articles from magazines or the Internet regarding CAM therapies"; (3) *Intentions*: "I plan to expand my practice to include CAM treatments"; and (4) *Behaviors*: "I recommend CAM therapies to my patients."

vii. Use of CAM is a subset of Positive CAM Behavior and includes 4 questions aggregated separately to assess actual use or recommendation of CAM treatments.

viii. Institutional Concerns include questions meant to assess concern over medical profession norms, legal liability, health insurance coverage, etc.

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