Comparative survey of Complementary and Alternative Medicine (CAM) attitudes and use and resource-seeking behavior amongst medical students, residents & faculty

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Abstract

Background

We previously reported on initial validation of the 10-item CHBQ (CAM Health Belief Questionnaire) using responses from medical students in years 1 and 2 (n=272), together with data on their reported use of CAM modalities and primary CAM information resources [1].

Methods

New survey data on CAM modality use, key CAM information resources, and CAM attitudes was collected amongst (1) a new cohort of medical students and additional data on the previous cohort (n=355), (2) two successive classes of interns entering residencies in medical and surgical disciplines (n= 258), and (3) faculty from diverse health professions attending workshops on evidence-based CAM with the goal of integrating CAM instruction into their own teaching (n= 54). New survey data are described and compared to that obtained previously.

Results

Medical students followed from year 1 to 2 and from year 2 to 3 showed no significant change in their already positive attitudes towards CAM. Compared to interns and medical students, faculty who teach or intend to integrate CAM into their teaching have more positive attitudes as measured on the CHBQ, and use CAM modalities significantly more frequently. Use of CAM information resources differed among the respondent types.

Conclusions

Faculty, students and interns demonstrate positive attitudes toward CAM use and integration into allopathic education, and themselves use CAM modalities at a high frequency. CAM teaching should therefore be focused on acquiring knowledge of available CAM modalities and skills to appraise evidence to appropriately advice patients on best approaches to CAM use.
Background and Rationale

There is significant and growing national interest in the introduction and integration of CAM instruction into allopathic medical education, in part supported by recent educational funding from the National Institutes of Health [2]. Reliable, practical, and valid measures of CAM learning outcomes are not widely available and existing measures still are in various developmental stages. The evaluation of CAM curricular impact is complicated by the perceived heterogeneity of baseline attitudes toward CAM practices. Tracking change in learner attitudes is one strategy to document successful and effective CAM instruction. Reports documenting attitudes of medical students [3, 4] and nursing, medical and pharmacy students and faculty [5] have used survey instruments that were not validated. Two survey instruments were recently validated. The first, the 29-item Integrative Medicine Attitude Questionnaire (IMAQ), was tested on internists attending a conference on holistic medicine and their responses were compared to those attending an annual general professional meeting. The second, our 10-item CAM Health Belief Questionnaire (CHBQ) was validated against the IMAQ using 3 cohorts (n=272) of medical students at one medical school [1] with coefficient alphas of .70 to .75 for each item. The CHBQ was accompanied by questions to respondents about self-use of CAM modalities and use of CAM information resources. Rates of CAM use by medical students were found to be higher than reported in the US general population in 1998 [6, 7] and 2004 [8]. For example, 73.5% reported use of at least one modality and 54.0% used two modalities. Massage was the most frequently used modality at 43%.

The objective of this study was to investigate CAM attitudes and use amongst entering interns and faculty who teach or intend to integrate CAM into their courses or classes, and to compare
CAM attitudes amongst year 1, 2 and 3 medical students. We hypothesized that intern attitudes, which reflect attitudes of medical students at graduation, may show a more negative trend than entering medical students; while faculty who teach or intend to teach CAM would be expected to have more positive attitudes and themselves use CAM modalities at a higher rate than medical students.

At University of California, Irvine (UCI) CAM instruction at the time of the study was offered in year 1 as a 2-hour panel (with patients and CAM practitioners) discussion to the entire class followed by learning issues integrated into problem-based learning cases taught longitudinally across year 1. During one of 4 evidence-based medicine hands-on search classes, students were shown a variety of CAM databases and examples of CAM-related evidence. In year 2 students interviewed at least one patient who used a CAM modality during a community preceptorship and presented the case to peers and faculty with evidence related to that CAM modality. In years 3 and 4, instruction was integrated into the primary care clerkships during lectures and clinic discussion. In the third year, students experienced CAM instruction in noon lectures in two clerkships and were tested for their ability to counsel a patient on acupuncture and use of an herbal for osteoarthritis in the Family Medicine clerkship Objective Structured Clinical Examination. The total hours of required formal CAM instruction across 4 years was approximately 8 hours. CAM electives were offered in years 1 and 2 and were taken by approximately 30% of the class in year 1 and 10% of the class in year 4.

**Study Sample**
The entering class size is 92 students. Two classes at the University of California, Irvine (UCI), School of Medicine were longitudinally sampled. One cohort consisted of first-year (MS 1) students who were resurveyed as second years. The other cohort was from the previous study [1] of second-year medical students (MS 2) which was resurveyed as third years (MS 3). Analysis was combined for the two MS 2 classes. MS 1 were surveyed during the first six weeks after school entry (fall of 2002) as an in-class exercise and before exposure to any CAM instruction. One MS 2 class was surveyed during the last six weeks of their second year (spring of 2002). The other MS 2 class was surveyed midway through their second year (winter of 2002). The survey of both MS 2 classes occurred after exposure to 3 hours of didactic CAM instruction in a required Patient Doctor course. The total sample utilized for this study comprised one cohort which was surveyed as MS1 and MS2 and one cohort sampled as MS2 and MS3.

Respondents from the intern group were all interns (first year residents) entering medical and surgical residencies at UCI in the academic years beginning 1 July 2002 and 2003. Fewer than 40% of interns were UCI graduates. Faculty respondents were UCI faculty attending one of two workshops offered on evidence-based CAM instruction in November 2002 and October 2003. The faculty included nursing and physician faculty representing diverse medical disciplines that included primary care and subspecialties.

**Study Design and Methods**

**Measures.** The previously validated 10-item CAM Health Belief Questionnaire (CHBQ) was framed in the seven-point, Likert-type rating scale format (where 1 = “Absolutely Disagree,” and 7 = “Absolutely Agree”) (fig. 1). Responses to all CHBQ items were scored so that a higher
response indicated greater endorsement. CHBQ total scale scores were computed by summing across their respective constituent rating items. Three CHBQ items were worded negatively to minimize the acquiescence response set (i.e., the tendency of respondents to reply in a consistent manner using only part of the rating scale range). Directions to the CHBQ respondents were: “Please read and respond to each of the 10 statements below by circling the number that most agrees with your beliefs.” The maximum possible score was 70 with a hypothetical midpoint of 35 (neutral attitude).

A written “CAM needs assessment” questionnaire was constructed by adapting items from two existing instruments [4, 9], and by adding items about CAM use. First, respondents’ self-reported use of 14 common CAM modalities was requested. Second, awareness and use of primary online and other CAM information resources were assessed. Both item sets elicited binary (“Yes”/“No”) response sets. Third, attitudes/beliefs were assessed with the 10-item CHBQ.

Data collection. Students from the original study were asked to anonymously and voluntarily complete the structured written questionnaire, which was presented as a baseline assessment of their perceptions about CAM. The questionnaire was administered by a staff member who was not involved in the students’ instruction or evaluation. Data were collected at one sitting lasting about 20 minutes. The survey for third year students (who had already been surveyed once the previous year) in this study was administered anonymously by pen and paper during a break in a clinical practice examination. Interns were asked to complete the same written questionnaire at an orientation to residency in the first week of July by a staff member unrelated to the project. Questionnaires were completed at one sitting within 20 minutes. Faculty attending the one-day
workshops were given the questionnaire at registration by staff members unrelated to the project and asked to return them completed, in a box provided by the end of the day. No incentives were given for completion of questionnaires. The entire project had IRB approval.

Data analysis. Analyses were performed using SPSS software (SPSS, Inc., Chicago, Illinois). First, descriptive statistics for all variables across all respondents were computed. Demographics of respondents (age, gender and self-identified ethnicity) were documented. The frequency that each CAM modality was used and the total number of modalities used was compared across the 3 groups of respondents. The frequency of awareness and use of each primary CAM information resource was documented. Total scale scores for the CHBQ was computed, by summing and averaging across each measure’s constituent rating items, and the resulting mean scores for each respondent group were compared. Between-group comparisons were made either by one-way analysis of variance, independent t-tests, Wilcoxon-Mann-Whitney tests, or \( \chi^2 \) tests, as appropriate for the variable’s underlying metric and distribution. Associations among survey variables were examined with Pearson product-moment or Spearman rank-order correlation coefficients. CHBQ and IMAQ item responses were analyzed to produce item means and standard deviations, corrected item-total scale score correlations, Cronbach’s coefficient \( \alpha \) reliabilities for scale scores, and coefficient \( \alpha \) reliability obtained after removing a constituent rating item from its respective scale score.

Results
The final sample included 667 respondents with 53\% (n=355) medical students, 39\% (n=258) interns and 8\% (n=54) faculty.
Respondents and their characteristics: Response rate for medical student respondents was 96.5%. Response rate for intern respondents was 100%. Response rate for faculty respondents was 60% of attendees at the workshops. Gender distribution was equal. 43% of student respondents identified themselves as white compared to 40% of interns and 59% of faculty. 92% of student respondents were aged 20-29 compared to 66% of interns and 7% of faculty. 8% of students were aged over 30 years compared to 34% of interns and 93% of faculty.

CAM modality use (fig. 2): Across the 3 groups of respondents, massage was the most frequently used modality by all 3 groups followed by spirituality and herbals. Faculty were most likely to use all modalities with the highest frequency, in addition to the top three, being meditation, chiropractic and traditional Oriental. Students and interns were similarly likely to use meditation and chiropractic with overall use being lower than that of faculty.

CHBQ scores (fig. 3): Mean scores for all 3 respondent groups exceeded the hypothetical midpoint of 35 (i.e. neutral responses to CAM practice and use). Mean score was highest for faculty (54.5) and similar for medical students (47.8) and interns (46.2). Medical students at three different points in their training (years 1, 2 and 3) showed similar mean CHBQ scores with no change in mean score for the cohorts followed from year 1 to 2 and from year 2 to 3.

Use of CAM resources. The most commonly identified resources (fig. 4) for CAM information for all 3 respondent groups were the Internet (75 to 80%), followed by journals (40 to 70%) and books (40 to 60%). Faculty were twice as likely to use journals as resources compared to
students and interns. Of online resources used, PubMed was identified most often (75 to 85% of respondents) followed by the Cochrane Library with few identifying use of the German E Commission and Combined Health Database as resources used. Faculty were more than twice as likely to use the Cochrane library compared to interns (60% of faculty identified this resource vs. 25% of interns).

**Conclusions and Discussion**

We conducted a survey of attitudes toward CAM and CAM use that included rate of self-use of CAM modalities and information-seeking behaviors amongst medical students, interns and faculty seeking to improve their knowledge and skills in teaching CAM. We used a previously validated measure, the CHBQ, to assess CAM attitudes. As expected, such faculty were likely to have more positive attitudes on the CHBQ compared to interns and students. They also demonstrated higher use of CAM modalities than medical students and interns. There was, not surprisingly, a positive correlation between attitude toward CAM and self-reported CAM use. Perhaps more of a surprise was that student attitudes toward CAM and CAM use remained stable and positive and did not deteriorate over the course of training from year 1 to 3 as might be expected from exposure to varying negative attitudes toward CAM during clinical training. CAM instruction at our institution in years 1 and 2 was limited to 3 hours in year 1 and two hours in year 2 of identifiable teaching and additional hours of integrated teaching consisting of patient interview exercises directed at eliciting health beliefs and CAM use. It is possible that continued longitudinal integrated instruction maintained positive attitudes toward CAM and CAM use. However the number of hours of instruction are relatively small. It is more likely that student attitudes are relatively resilient to change during training. If so, CAM instruction may be best
directed toward increasing student knowledge of CAM modalities available in their communities, patient use of CAM modalities and skills to access, appraise and interpret evidence on CAM use, to appropriately advise patients, rather than to changing student attitudes.

The finding of intern attitudes that are as positive as medical students is encouraging and suggests that CAM instruction in residency may be similarly directed toward increasing skill and knowledge rather than changing attitudes. In our study interns had experienced varying exposure to CAM instruction since they come from different medical schools.

In this study faculty were more likely to seek information from journals than from the internet, a practice that was the reverse of that shown by medical students and residents. This observation has implications for identifying strategies for faculty development and student training – improving faculty skills for searching the internet for validated sources of CAM information and improving student and resident ability to critically appraise and apply published CAM research appear to be parallel training priorities.

Our study has some limitations. It was conducted at one institution at which positive student attitudes have previously been demonstrated and it may not be able to be generalized to other institutions and settings. The attitudes and knowledge of CAM resources for other faculty to whom students are exposed during training was not elicited. However, our data give cause for optimism and progress in measuring the outcomes of CAM instruction. We conclude that given the stability and positive attitudes of students and interns over the course of training, student and resident evaluations should focus mainly on knowledge and skill acquisition around advising
patients on CAM use rather than changing attitudes toward CAM instruction or use. A comparative study with other medical schools would help to elucidate possible differences in CAM instructional needs across medical schools.

**Word Count:**

Abstract: 248 words

Main text: 2274 words.

**Abbreviations**

CAM – Complementary and Alternative Medicine

CHBQ – CAM Health Belief Questionnaire

IMAQ – Integrative Medicine Attitude Questionnaire

MS1, MS2, MS3 – Medical students in year 1, 2 and 3 of training, respectively.

UCI – University of California, Irvine

**Competing interests**

The authors declare that they have no competing interests.

**Authors’ Contributions**

Desiree Lie conceptualized and co-designed the study and was primary author for the manuscript. John Boker co-designed the study, evaluation measures, conducted data analysis and interpretation and reviewed and revised the manuscript.
Acknowledgements

Support for this project was provided by the Susan Samuei Center for Integrative Medicine, UCI and the American Medical Student Association Education for CAM project, through a subcontract from the R-25 award from the National Center for CAM (www.nccam.nih.org) at the National Institutes of Health. We thank the CAM Education Task Force at UCI for design and implementation of the CHBQ.

References

2. NCCAM [http://nccam.nih.gov]

Figures

Figure 1 – CHBQ Items
All items had a 7-point response scale with rating of 1 = “Absolutely Disagree” and 7 = “Absolutely Agree.”


UCI, School of Medicine

**Figure 2 – CAM Modality Use by Respondent Type**

For each CAM Modality, the bars (from left to right) represent Medical Students (n=355), Interns (N=258), and Faculty/ Practitioners (n=54).

UCI, School of Medicine, 2002 – 2004

**Figure 3 – CHBQ Mean Scores for 3 Respondent Types**

UCI, School of Medicine, 2002 – 2004

**Figure 4 – CAM Information Sources Used by Respondent Type**

For each source, the bars (from left to right) represent Medical Students (n=355), Interns (N=258), and Faculty/ Practitioners (n=54).

UCI, School of Medicine, 2002 – 2004
<table>
<thead>
<tr>
<th>CHBQ Items</th>
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<tbody>
<tr>
<td>1. The physical and mental health are maintained by an underlying energy or vital force.</td>
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<tr>
<td>2. Health and disease are a reflection of balance between positive life-enhancing forces and negative destructive forces.</td>
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<tr>
<td>3. The body is essentially self-healing and the task of a health care provider is to assist in the healing process.</td>
</tr>
<tr>
<td>4. A patient’s symptoms should be regarded as a manifestation of general imbalance or dysfunction affecting the whole body.</td>
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<tr>
<td>5. A patient’s expectations, health beliefs and values should be integrated into the patient care process.</td>
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<tr>
<td>6. Complementary therapies are a threat to public health.</td>
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<tr>
<td>7. Treatments not tested in a scientifically recognized manner should be discouraged.</td>
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<tr>
<td>8. Effects of complementary therapies are usually the result of a placebo effect.</td>
</tr>
<tr>
<td>9. Complementary therapies include ideas and methods from which conventional medicine could benefit.</td>
</tr>
<tr>
<td>10. Most complementary therapies stimulate the body’s natural therapeutic powers.</td>
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</tbody>
</table>
CHBQ Mean Scores for 3 Respondent Types

Figure 3
CAM Information Sources Used by Respondent Type

![Bar chart showing the percent who selected different resource types for CAM information. The resource types include Books, Internet, Journals, Videos, and Health Databases. The chart indicates that the Internet is the most commonly used resource, followed by Books, Journals, Videos, and Health Databases.]