Complementary/Alternative Medicine: Comparing the Views of Medical Students With Students in Other Health Care Professions

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Objective: We compared the opinions, knowledge, and attitudes of final-year medical, physiotherapy, occupational therapy, nursing, and pharmacy students about complementary/alternative medicine (CAM).

Methods: A cross-sectional study questionnaire (n=442) was administered on site at the University of Western Ontario and the University of Toronto to fourth-year health professions students. Outcome measures were self-reported knowledge, attitude, and perceived usefulness of CAM therapies, the perceived importance of scientific inquiry for the acceptance of CAM, and educational exposure to the topic.

Results: Educational exposure to CAM was correlated with the perceived usefulness of CAM. Medical students reported the least amount of education about CAM and viewed CAM therapies as less useful than did their health professions student peers. Medical students and pharmacy students were more likely than the other health professions students to view traditional scientific forms of evidence as necessary before accepting CAM therapies.

Conclusions: Perceptions differed among the different health professions student groups about the usefulness of CAM therapies and the kind of evidence needed before they should be incorporated into standard care. This may have important implications for multidisciplinary care.

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Complementary/alternative medicine (CAM) continues to attract the attention of patients, physicians, policy makers, and administrators. As more studies indicate high patient interest in and use of CAM (30%–50% of patients report CAM use), it has become important to understand health professionals’ attitudes with respect to CAM. Previous studies in this area have assessed physicians’ and medical students’ attitudes. In addition, the attitudes of pharmacists and nurses have been investigated. However, data collection for many of these studies occurred 5 or more years ago, before widespread media attention focused on CAM.

Earlier research (1974) indicated differences in attitudes toward various issues among students in different health science training programs, and new information is needed. Potential differences in the opinions of various health professions students with respect to CAM would have implications for the multidisciplinary delivery of health care, patient-practitioner relationships, and the development of educational initiatives on this topic. This study compared five different health care professions student groups’ (medical, pharmacy, nursing, physiotherapy, and occupational therapy) attitudes about and knowledge of CAM.

Methods

A questionnaire was administered in class to fourth-year medicine, pharmacy, nursing, physiotherapy, and occupational therapy students during the 1997–1998 academic year at the University of Western Ontario (UWO) and the University of Toronto (UT). The UT medical school was the only program that declined to participate in the study. Students from all other health science programs at both universities took part in the study, and pharmacy training occurs at only one of the two universities.

Students were invited to participate and were assured of the confidentiality of their responses in a standardized manner by one of the investigators. The study was approved by the UWO Review Board for Health Sci-
ences Research Involving Human Subjects and by Research Services at UT. The majority of the questionnaire items were adapted from those shown to be valid and reliable in earlier studies that assessed physician and medical student attitudes toward CAM.6,19,21

The questionnaire focused on the students’ perceptions of the general field of CAM and the 11 CAM therapies believed to be most popular in North America. An explicit definition of CAM was intentionally omitted from the questionnaire. An additional complementary technique, “ortology,” was fabricated to assess the validity of responses regarding knowledge and perceived usefulness.

Statistical Analysis

The data were entered and analyzed using EpiInfo 6.03® (Centers for Disease Control and Prevention, Atlanta, 1996). Absolute and relative frequencies of responses to the questionnaire were tabulated. The mean scores obtained on the attitude, knowledge, usefulness, and rules of scientific inquiry scales were compared in GraphPad Prism for Windows 2.01® (GraphPad Software Inc, 1996), using the Kruskal-Wallis test with Dunn post-hoc comparisons to identify differences between groups.

Race/ethnicity was investigated as a possible determinant of attitudes, knowledge, and perceived usefulness of CAM, because many therapies labeled as CAM in North America are mainstays of health care in other countries and may form part of the cultural health care traditions of some families. The gender mix in the different health care professions differs, so the influence of gender was also investigated using Mann-Whitney tests. An alpha criterion of .05 was used. Where results from the same group at the two different universities did not differ statistically, the two groups were pooled for subsequent analyses.

Results

Response Rates and Respondent Characteristics

Almost 100% of students present in each class on the day of the study agreed to participate. The number of respondents were: physiotherapy (n=90), occupational therapy (n=101), nursing (n=86), pharmacy (n=102), and medicine (n=61).

In every student body except pharmacy and medicine, the respondents were predominantly female (overall 79% [338/428]). The average ages of the students in the health professions groups ranged from 25 to 29. The majority of respondents, 67.7% (298/440), identified themselves as Caucasian, 12.7% (56/440) as Chinese, and 9.1% (40/440) as South Asian or Southeast Asian. A small number of students identified themselves as Arab/West Asian, Filipino, Latin American, Japanese, or “other.” There were no systematic differences in responses to questionnaire items attributable to gender or race within any university group.

General Attitudes Toward CAM

Of the total respondents, 94.1% (411/437) believed that patient demand for CAM is increasing, and 5.9% (26/437) believed that demand was stable. No respondents thought that demand was decreasing.

Overall, students’ general attitudes toward CAM were positive (Table 1). Compared to all other students, medical students were the least likely to agree or strongly agree that, “CAM is a useful supplement to regular medicine,” “CAM includes ideas and methods from which regular medicine could benefit,” “Most CAM therapies stimulate the body’s natural healing powers,” or “Practitioners should have some knowledge and geographical awareness about the most commonly used CAM therapies.”

Personal Experiences With CAM

A total of 28.1% (122/434) of respondents had consulted a CAM practitioner. Nursing students were significantly more likely to have done so than either the pharmacy or medicine students (Kruskal-Wallis=28.7, d.f=5, P<.05); 44.7% (38/85) of Nursing students reported consultation with a CAM practitioner, compared with 18.2% (18/99) of pharmacy students and 10.0% (6/60) of medicine students. The top four practitioners consulted were massage therapists, chiropractors, herbal medicine practitioners, and acupuncturists. No statistically significant differences existed between student bodies with respect to the number of students self-administering CAM therapies, although the frequency of medicine students doing so was lower than the frequencies for all other faculties: physiotherapy 22.2% (20/90), occupational therapy 25.3% (25/99), nursing 34.9% (30/86), pharmacy 44.6% (45/101), and medicine 21.3% (13/61). The top three self-administered therapies were herbal medicine (22.3%), aromatherapy (4.8%), and homeopathy (2.9%).

Knowledge of CAM Therapies

Overall, knowledge ratings were highest for those therapies that are considered the most mainstream (chiropractic, massage therapy, acupuncture, and herbal medicine) and lowest for less-widely accepted therapies (homeopathy, faith healing, and reflexology) (Table 2). Pharmacy students reported significantly more knowledge of both herbal medicine and homeopathy than all other students; physiotherapy students reported significantly more knowledge of acupuncture, chiropractic, and massage therapy than all other faculties, and nursing students reported the highest knowledge of therapeutic touch (Table 2).

Usefulness Ratings of CAM Therapies

The percentages of students in the different programs rating a therapy as useful or very useful were highest for the more commonly used CAM therapies, such as chiropractic, herbal medicine, and massage therapy
Medicine students rated all therapies less useful than all other students. The student group with the highest reported knowledge about a given therapy generally gave that therapy the highest usefulness rating.

**Rules of Scientific Inquiry for Acceptance of CAM Therapy**

Medicine and pharmacy students were more likely than other groups to place high value on evidence-based, rather than anecdotal, forms of support for CAM (Table 4). Medicine students ranked human randomized controlled trials as more important than did physiotherapy, occupational therapy, or nursing students (Kruskal-Wallis=34.6, \( df=5 \), \( P<.05 \)). Medicine and pharmacy students ranked anecdotal patient reports as significantly less important than did the physiotherapy, occupational therapy, or nursing students (Kruskal-Wallis=57.4, \( df=5 \), \( P<.05 \)).

**Information About Undergraduate Curricula and Training in CAM**

The percentage of students in each program who stated that their curriculum had included information on CAM varied widely. Medicine students uniformly claimed less educational exposure to CAM than did other students. Pharmacy students (99%) were more
likely than all other students to think that CAM should be taught as a separate course in their curriculum (Kruskal-Wallis=97.9, df=5, P<.05), but support for this idea was also quite high in all the other student groups (range 44% occupational therapy to 70.9% nursing). Medicine students were the only group that had not received any faculty-coordinated training to practice a CAM therapy.

More than two thirds of students in all programs were interested in receiving training to practice a form of CAM, with the exception of medicine students, who expressed the lowest interest in such training (42.6%). Physiotherapy, occupational therapy, nursing, and pharmacy students were each significantly more likely to be interested in training than were medicine students (Kruskal-Wallis=110, df=5, P<.05).

### Validity of Response

No students in any health professions program reported knowing a lot about “ortology” (Table 2). A small percentage of physiotherapy and nursing students responded that ortology was useful (Table 3).

### Discussion

This is the first Canadian study to investigate the topic of CAM across multiple undergraduate health professions student bodies. Given the increasing use of CAM by patients and the current focus on integrated,
multidisciplinary, patient-centered care, it is important to identify differences in the knowledge and attitudes of different members of the health care team that may result in mixed messages that can be confusing for patients.

Our results indicate that the belief that specific CAM therapies are useful is correlated with the amount of knowledge a particular group of students reported about each therapy. Since medical students were the only group who reported no discussion of CAM in their training, it is not surprising that they rated the usefulness of all CAM therapies lower than all other student groups. Interestingly, most students, regardless of professional affiliation, agreed with the statement “Practitioners should have some knowledge about the most common CAM therapies,” which seems to indicate that all health care professions students identify a need for discussion of CAM within their curricula.

Differences among students with respect to knowledge and perceived usefulness of individual CAM therapies can be attributed only partially to different levels of exposure and training. The fact that general attitudes about CAM and perceptions about the importance of differing levels of “scientific evidence” to prove the safety and efficacy of CAM therapies also differ among different groups suggests that differences in the culture and values internalized during the students’ training are also a factor. Differences in personalities, values, communication and social skills, goals, and styles of health professional training that exist between groups of health professionals may affect the ways students perceive CAM, as well as the ways patient care is delivered. This may be particularly important when health care professionals are asked for guidance by patients confused about relatively under-studied areas of health care such as CAM. Patients are currently bombarded by

### Table 3

Health Professions Students’ Perceived Usefulness of Different Complementary/Alternative Therapies

<table>
<thead>
<tr>
<th>Complementary/Alternative Medicine Therapy</th>
<th>PT n=88</th>
<th>OT n=100</th>
<th>NRS n=83</th>
<th>PHM n=102</th>
<th>MED n=61</th>
<th>Significant Differences Between Groups* (P&lt;.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acupuncture</td>
<td>83.6</td>
<td>55.0</td>
<td>57.9</td>
<td>44.1</td>
<td>42.6</td>
<td>PT&gt;all other groups</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>12.5</td>
<td>16.0</td>
<td>36.1</td>
<td>5.9</td>
<td>4.9</td>
<td>NRS&gt;PT, OT, PHM, MED</td>
</tr>
<tr>
<td>Chiropractic</td>
<td>47.2</td>
<td>51.0</td>
<td>67.5</td>
<td>66.6</td>
<td>44.2</td>
<td>NRS&gt;OT</td>
</tr>
<tr>
<td>Faith healing</td>
<td>3.3</td>
<td>12.2</td>
<td>19.3</td>
<td>8.9</td>
<td>3.3</td>
<td>No differences</td>
</tr>
<tr>
<td>Herbal medicine</td>
<td>26.9</td>
<td>44.0</td>
<td>55.5</td>
<td>70.6</td>
<td>14.8</td>
<td>NRS&gt;PT, MED, PHM&gt;PT</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>9.1</td>
<td>26.0</td>
<td>33.7</td>
<td>14.7</td>
<td>8.2</td>
<td>NRS, PHM&gt;PT</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>6.7</td>
<td>14.0</td>
<td>20.5</td>
<td>13.7</td>
<td>6.5</td>
<td>No differences</td>
</tr>
<tr>
<td>Massage therapy</td>
<td>86.6</td>
<td>80.0</td>
<td>83.2</td>
<td>52.0</td>
<td>45.9</td>
<td>PT, OT, NRS&gt;PH, MED</td>
</tr>
<tr>
<td>Naturopathy</td>
<td>16.6</td>
<td>UWO=7.0</td>
<td>29.3</td>
<td>14.7</td>
<td>6.6</td>
<td>UT OT, NRS&gt;UWO OT</td>
</tr>
<tr>
<td>Orthology</td>
<td>1.1</td>
<td>0</td>
<td>7.2</td>
<td>0</td>
<td>0</td>
<td>No differences</td>
</tr>
<tr>
<td>Reflexology</td>
<td>12.2</td>
<td>9.1</td>
<td>31.3</td>
<td>4.9</td>
<td>0</td>
<td>NRS&gt;OT, PHM, MED</td>
</tr>
<tr>
<td>Therapeutic touch</td>
<td>6.7</td>
<td>27.0</td>
<td>46.9</td>
<td>10.8</td>
<td>4.9</td>
<td>NRS&gt;all other groups, OT&gt;PT</td>
</tr>
</tbody>
</table>

* based on mean usefulness scores. Mean usefulness scores are not provided in this table.

PT—physiotherapy
OT—occupational therapy
NRS—nursing
PHM—pharmacy
MED—medicine
UWO—University of Western Ontario
UT—University of Toronto
misinformation about CAM products. Contradictory advice from conventional health care practitioners places patients in the unenviable position of trying to decide who to trust. Clearly, this has wider implications for the delivery of integrated multidisciplinary care that require further investigation. Given the widespread agreement on the necessity of including CAM in undergraduate health profession curricula, interdisciplinary educational initiatives may be the best way to tackle this issue.

Strengths and Limitations of the Study

The results presented here are limited by the fact that the data were gathered via self-report from the students. In addition, the generalizability of the data is limited by the knowledge that the culture of health professional programs may differ from university to university across Canada and other countries. Where possible (nursing, occupational therapy, physiotherapy), we collected data at two different university sites; however, for pharmacy and medicine, we were only able to obtain data for one group. The fact that attitude, knowledge, perceived usefulness, and rule of scientific inquiry scores rarely differed between the two university settings for the same group suggests that our results may be generalizable to students throughout Ontario and possibly Canada. The extremely low proportion of respondents claiming to know anything about the fabricated therapy “ortology” strengthens the validity of respondents’ answers to other questions.

Conclusions

As investigators and policy makers struggle to make sense of the growing popularity of CAM, the opinions of those delivering health care must be considered. The attitudes of today’s students become the attitudes of tomorrow’s health care practitioners and emerging trends in this field have implications for practitioner-patient relationships, educational initiatives on CAM, and the future of multidisciplinary health care delivery in Canada.

Table 4

The Importance of Rules of Scientific Inquiry for Acceptance of a Given Complementary/Alternative Therapy

<table>
<thead>
<tr>
<th>Rule of Scientific Inquiry</th>
<th>% Who Perceived the Rule to Be Important or Essential*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven mechanism of action</td>
<td>76.9 61.0 67.5 60.8 63.9</td>
</tr>
<tr>
<td>Proposed biological mechanism of action</td>
<td>83.5 56.4 67.1 64.7 78.7</td>
</tr>
<tr>
<td>Randomized controlled clinical trials involving humans</td>
<td>76.6 70.3 72.3 83.4 89.3</td>
</tr>
<tr>
<td>Animal studies</td>
<td>30.0 19.8 32.1 39.2 52.5</td>
</tr>
<tr>
<td>Epidemiological studies</td>
<td>66.3 60.6 59.0 61.7 80.3</td>
</tr>
<tr>
<td>Published case studies</td>
<td>74.4 66.0 71.9 55.5 60.7</td>
</tr>
<tr>
<td>Success in practice</td>
<td>94.5 89.1 96.4 90.2 77.0</td>
</tr>
<tr>
<td>Colleague recommendation</td>
<td>53.4 49.6 55.4 39.2 39.4</td>
</tr>
<tr>
<td>Personal experience</td>
<td>65.1 63.3 71.1 51.0 42.6</td>
</tr>
<tr>
<td>Patient reports</td>
<td>71.1 78.2 83.1 48.0 45.9</td>
</tr>
</tbody>
</table>

* based on mean importance scores. Mean importance scores are not provided in this table.

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