

Lessons learned from complementary and integrative medicine curriculum change in a medical school

MOSHE FRENKEL,^{1,2} ANN FRYE,³ DIANE HELIKER,⁴ TRACIE FINKLE,⁴ DAVID YZAGUIRRE,⁴ ROBERT BULIK^{1,3} & VICTOR SIERPINA¹

OBJECTIVES This paper describes a pilot study that examined lessons learned from the introduction of complementary and alternative medicine (CAM) elements into a medical school curriculum.

METHODS A qualitative approach was selected as a first step in evaluating the phenomenological experience of introducing the CAM Educational Project in 2000–05. In 2005, semi-structured interviews were conducted with faculty staff and graduating students who had participated in all 4 years of the CAM Project. Qualitative content was analysed focusing on linguistic data and contextual meaning.

RESULTS The overall response to the integration of CAM curricular elements into the medical school curriculum was positive among all faculty and graduating medical students. Participant experiences were often dependent on the perceived rigour of alternative approaches to a presenting patient problem, along with the importance attributed to openness to patient perspectives as part of evidence-based practices. There was an appreciation of the importance of developing increased awareness and utilisation of CAM in medical practice, as well as a recognition of resistance by some medical school faculty to CAM approaches.

CONCLUSIONS This evaluation of a specific CAM educational project suggests potentially transferable findings to other medical schools. Integrating CAM into the medical school curriculum requires a dedicated team if it is to result in a significant change. This change requires that CAM practices are visible to both students and faculty, that there is a co-operative climate, accessible resources, and institutional support, and that CAM content is embedded into the existing curriculum. All these factors combined can lead to sustainable integration of CAM content issues into the medical school curriculum.

KEYWORDS pilot projects; education, medical, undergraduate/*organisation & administration; complementary therapies/*education; curriculum; programme evaluation.

Medical Education: 2007; 41: 205–213
doi:10.1111/j.1365-2929.2006.02654.x

INTRODUCTION

The increasing popularity of complementary and alternative medicine (CAM) among the general public¹ has led an increasing number of medical educators to acknowledge the need to teach CAM to medical students and doctors.² In 1998, 75 of 125 US medical schools offered elective courses in CAM or included these topics in required courses.³ This number rose to 98 schools in the 2002–03 academic year.⁴

There was tremendous heterogeneity and diversity in content, format and requirements among the different courses.³ This raised concerns with some authors, who felt there should be a structured approach that emphasises scepticism and critical thinking.^{5–8} In its latest report, the Institute of Medicine (IOM) of the

¹Complementary and Alternative Medicine (CAM) Education Project, Department of Family Medicine, University of Texas Medical Branch, Galveston, Texas, USA

²Integrative Medicine Program, University of Texas MD Anderson Cancer Center, Houston, Texas, USA

³Office of Educational Development, University of Texas Medical Branch, Galveston, Texas, USA

⁴School of Nursing, University of Texas Medical Branch, Galveston, Texas, USA

Correspondence: Moshe Frenkel MD, Associate Professor, Medical Director, Integrative Medicine Program, University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd, Unit 145, Houston, Texas 77030, USA. Tel: 00 1 713 745 0624; Fax: 00 1 713 563 9733; E-mail: mfrenkel@mdanderson.org

Overview

What is already known on this subject

An increasing number of medical educators acknowledge the need to teach complementary and alternative medicine to medical students and doctors.

Until now there has been no clear, consistent and acceptable educational approach to the incorporation of information about complementary medicine into medical school curricula.

What this study adds

The incorporation of complementary medicine into the medical school curriculum requires a dedicated team to cause a significant change.

This process of implementation requires strong leadership, visibility of the complementary practices, easily accessible reliable resources, the embedding of complementary medicine issues into the existing curriculum and institutional support.

Suggestions for further research

Additional similar studies that incorporate information about complementary medicine are needed to further advance understanding of the best and most acceptable educational approach.

National Academies states that it is important for schools of health professions to include information about CAM in their required curricula. The IOM feels that this information is crucial to enabling health care practitioners to inquire about their patients' use of CAM. This inquiry should be carried out in a way that is non-judgemental and allows health care practitioners to advise their patients about the use or avoidance of CAM therapies on the basis of the available evidence.⁹ Others mention that some educators in the USA are incorporating CAM into the curriculum because they realise that CAM education in medical school can advance conventional medical educational goals.¹⁰

These educational initiatives and approaches provided the initial steps in the development of a consistent approach to CAM and a starting point for medical educators.⁵ The recent IOM report echoes these recent trends to move CAM away from the margins, but notes, however, that 'there is no consensus on what should be taught and how to fit it into an already crowded set of courses'.⁹

The National Center for Complementary and Alternative Medicine (NCCAM) at the National Institutes of Health (NIH) identified this need and felt it was a priority to develop a consistent educational approach to CAM use. As a result, in the last 5 years NCCAM has funded 15 CAM education projects at US medical and nursing schools. It was the NCCAM's hope that this would lead to an acceptable approach to incorporating information about CAM into the curricula of medical, nursing and allied health professional schools, and into both residency training programmes and continuing medical education (CME) courses.⁹

The University of Texas Medical Branch (UTMB) was among the first institutions to receive this support from the NIH/NCCAM. A team of CAM practitioners and medical educators developed and implemented a plan for curricular change in the medical school. The core goals of the CAM curriculum included enabling students to:

- 1 communicate effectively with patients about CAM use;
- 2 assess and interpret the evidence for safety, efficacy and clinical appropriateness of CAM therapies;
- 3 develop a therapeutic relationship that is patient-centred and includes respect for a pluralism of cultural and religious values, and
- 4 develop positive personal perspectives on the construct of wellness and of illness.

The CAM Education Project activities included multiple multidisciplinary lectures, workshops, incorporation of CAM-related issues into a variety of courses in the medical school, both elective and selective structured rotations for students and residents, a university-wide CAM journal club, guest speakers on issues related to CAM, faculty development activities, and the development of web-distributed resources for all levels of learners and faculty (Appendix available on request from the corresponding author).

This study was designed as a pilot project with the purpose of examining the lessons learned from the

introduction of curricular elements of CAM into a medical school curriculum. As there are little data currently available in this arena, the authors felt that this pilot project ought to begin with a qualitative approach to evaluate this educational initiative.

METHODS

This study used an exploratory qualitative approach consisting of in-depth, face-to-face, semi-structured interviews. A qualitative approach was deemed most appropriate to capture the perceptions and experiences of those directly involved in teaching and learning about CAM and its incorporation into medical practice. The assessment was supported by part of an R25 NCCAM grant from the NIH.

Setting

This university has a roll of over 2000 students at its 4 schools and 2 institutes. The School of Medicine has 800 students and 934 full-time faculty staff. Clinical training takes place in 7 teaching hospitals, all of which are owned and operated by the university and which are physically located on campus. There are 900 teaching beds and 147 specialty and sub-specialty hospital and outpatient clinics.

Participants

A purposeful sample was used to focus on individuals who taught on the CAM-enhanced courses and clerkships, and students who completed all 4 years of the modified curriculum. The participants were identified by a CAM grant administration team consisting of the R25 grant primary investigator (PI), who is a family doctor with an interest in CAM, the grant's co-investigator, who has joint appointments with both the family medicine department and the office of educational development, a grant co-ordinator, and key faculty personnel from the family medicine and paediatric departments with interests in CAM and medical education. Although this qualitative study focused on the change process experienced by faculty across various areas, from teachers ($n = 7$) to administrators ($n = 4$), the authors also included a medical student perspective ($n = 4$).

Teachers who were interviewed were directly involved in the delivery of curricular elements of CAM that had been developed by a multidisciplinary team of faculty and funded by the R25 grant.

The administrators interviewed included the vice-dean of educational affairs, 2 members of the Office of Educational Development responsible for the overall evaluation of the medical school curriculum, and the chair of the Department of Family Medicine. The graduating medical students interviewed had experienced all 4 years of the enhanced curriculum. They represent a convenience sample of randomly selected graduates of the university who are still present and working in the university setting. The R25's PI and co-investigator were not involved with data collection or the analysis.

Interviews

To ensure that informants discussed the same themes, a semi-structured interview guide was formulated. The main question was open-ended: 'Tell me about your experience with the CAM grant.' Additional probing questions included questions such as: 'If there were changes, what were they?' 'What do you attribute those changes to?' 'How did those changes come about?' 'Describe 3 important strengths/weaknesses in the programme', and 'Do you have any comments for the future, as far as integrating CAM into medical education?' All interviews were conducted by 1 of the authors chosen for his advanced interviewing skills and the fact that he joined the project toward the end of the study period and was less identified as an integral part of the CAM Project. The interviews were held after obtaining individual informed consent, at a location chosen by the informant. The interviews lasted 30–60 minutes and audio-recordings were made of the conversation and then transcribed verbatim.

Data analysis

The data analysis method consisted of qualitative content analysis that focused upon linguistic data and contextual meaning, interpreting narrative text and its relative meaning. The words of all participants were reviewed (analysed) and common categories, themes and subthemes were identified. This approach was used as opposed to quantitative content analysis, which is more appropriate for the reduction of very large datasets.¹¹ The analysis was carried out by 3 experienced qualitative researchers. None of these 3 were part of the CAM Education Project and all were experienced in coding and thematic interpretation.

The qualitative researchers individually and independently analysed all interview texts. After carefully

reading all transcripts several times, the following steps were used to analyse the content across all interviews:¹²

- 1 in accordance with qualitative content analysis methodology, the specific aims and related interview questions posed by the researcher served to inform and guide the initial master, first-level coding, and development of categories and themes;
- 2 themes, subthemes or second-level codes were then developed from the participant's own words; this was accomplished by using line-by-line coding, highlighting various phrases or sentences, identifying subthemes and categorising all variables, and
- 3 a third-level coding resulted in meaningful constructs that were formulated through a process of interpretation.

Following the master and second-level coding, the 3 coders met periodically to discuss thematic agreement and consistency in derived latent and manifest content analysis. Inconsistencies were challenged and resolution attained by returning to the text and, when necessary, to the participants, thus ensuring credibility.¹³ Agreement among the researchers regarding coding and emergent themes provided rigour of interrater reliability.

RESULTS

Eleven faculty members and 4 graduates from the School of Medicine were interviewed for this part of the study. The coding procedures resulted in the identification of main themes for faculty and graduates. Themes shared among faculty and graduates were:

- 1 visibility of CAM;
- 2 integration of CAM practices;
- 3 legitimisation of CAM;
- 4 popularisation of CAM;
- 5 openness to CAM, and
- 6 bias/resistance to CAM.

Additional themes unique to faculty were:

- 7 cultivating and acculturating CAM, and
- 8 sustainability of CAM.

One theme was exclusive to graduates:

- 9 presence/absence of practising CAM.

Some themes ran through several categories, as described in more detail in the following sections.

Visibility of CAM

Both faculty and graduates spoke of the importance of CAM visibility. Faculty members frequently associated CAM visibility with championing and integration. One faculty member stated that the PI for the R25 grant:

‘...has been a very important force, a champion, being visible, and bringing it [CAM] forward.’

Another mentioned that the same PI's leadership and success was just an obvious role model for how to apply an education grant across the curriculum. Conversely, many faculty members voiced concerns over the need to depend on a champion:

‘If [the R25 PI] were to leave, it [CAM] would be at risk.’

Medical school graduates frequently correlated CAM visibility with witnessing CAM practices among patients and doctors. One graduate reported:

‘It made a difference because we tried all these, you know, morphine and Vicodin to break her pain and we even called the pain clinic. Nothing worked for her. She was always in constant pain, constant pain. and it wasn't until [the R25 PI] came, and I was in there when he was putting in the acupuncture needles, and I was like, “Wow!” It was just the next day, even that afternoon she was fine, so that made a big impression.’

Integration of CAM practices

Integration of CAM played an important role for both faculty and graduates. Faculty members frequently related visibility and championing to the success of CAM integration. Several faculty members spoke about CAM education at UTMB as representing an ‘integrated approach versus a separate entity’. One faculty member stated:

‘[The R25 PI] has actively worked on the incorporation of CAM into the curriculum through lectures, cases, small-group interactions and providing resources.’

Interviewees indicated that the availability of educational materials, books, the website, journal

clubs and electives contributed to the successful integration of CAM practices for faculty members. Graduates stated that CAM is 'embedded in the curriculum'. They did not appear to realise that their routine practice of questioning patients about the use of herbs, nutritional supplements and other CAM practices is not common to all medical schools.

Legitimation of CAM

Faculty members and graduates spoke of the importance of legitimising CAM practices. Both groups stated that many of their patients were practising CAM therapies and felt they, as health care providers, needed to be aware of these therapies. Faculty members associated legitimisation with funding sources and sustainability. Various faculty comments included:

'The grant brought about curriculum changes and implied acceptance;'

'The R25 grant gave us a public voice;'

'The breaking down of barriers and getting people to look at CAM topics as legitimate approaches to patient wellness contributes to sustainability.'

Graduates associated legitimisation with popularisation of CAM. A student stated:

'It [CAM] worked tremendously for kids that got these chronic ear infections and were always on antibiotics. They'd start them on homeopathic medicines and therapies and they improved.'

In addition, the use of a journal club to review and critique the scientific evidence underlying CAM added to its legitimisation:

'[The R25 PI] never pressured the use of CAM approaches that were not critiqued.'

Popularisation of CAM

Faculty and medical school graduates spoke of the increased awareness of CAM practices among patients and the general public. Both groups stated that increasing numbers of people are choosing alternative medicines and in order to be a good doctor, one should be aware of CAM practices in general. Faculty members associated popularisation with CAM visibility. Faculty members noted an increase in journal advertisements and publications

about CAM practices. In addition, a faculty member reported an increase in 'visibility in the use of herbs, acupuncture, and manipulative therapies'. One faculty member noted:

'More people are seeing that it does work, that it helps people a lot and the people are using these medicines and getting better and doing well with them.'

Openness to CAM

Openness to CAM played an important part in the CAM Project for both faculty and graduates. Both groups were personally open to new CAM possibilities. A faculty member reported:

'There is decreasing scepticism and more open-mindedness.'

Other faculty members spoke of a resistance to change. Comments included:

'The faculty are still resistant to it [CAM];'

'It's a hard subject to sell and I think we're still fighting a lot of internalised attitudes among faculty and students.'

Bias/resistance to CAM possibilities

Resistance to CAM and bias were expressed by both faculty and graduates. Faculty members cited resistance more frequently than graduates. The absence of CAM visibility and integration created a bias for some faculty members:

'It is still not integrated enough and not seen as of value to the institution [UTMB].'

Another faculty member responded:

'Overcoming biases within the (CAM) curriculum has been difficult.'

Cultivating and acculturating

Cultivating and acculturating are themes unique to faculty members. They often related cultivation and acculturation to the visibility, integration and sustainability of CAM. Faculty reported, 'We do a better job than we did' and '...there are more options for

patients'. Expanding CAM in current courses and 'integrating CAM into what we do' was emphasised by several faculty members:

'It has a substantial presence that needs to be supported;'

'Keep CAM in education, get it into research, and integrate it into clinical care.'

The availability of web-based materials was significant for most faculty interviewed. Several faculty members noted that students were now incorporating CAM topics into patients' medical histories. One faculty member reported:

'Students are more receptive and comfortable with it [CAM].'

Sustainability

Sustainability is a theme exclusive to faculty responses. Faculty members associated sustainability with championing and cultivating. The PI of the R25 grant was mentioned many times by all faculty members when asked about the sustainability and success of CAM:

'It has infiltrated enough to the core that it will be sustained but without that force that's always been present and that constant advertisement it may diminish;'

'We need educated, knowledgeable faculty like [the PI] who want to help teach CAM.'

Faculty members voiced concerns regarding sustainability. They expressed the need to foster and develop new CAM education strategies:

'New faculty members need to be educated on teaching CAM;'

'Continue to survey people about their personal experiences because that will change over the years.'

In addition, many faculty members mentioned the need for institutional support and possible needs to renew or 'identify new frontiers and go for [more] grant funding':

'It [CAM] will need consistent attention once the grant finishes.'

Presence of practising CAM

Practising CAM is a theme identified among graduates responses. Graduates correlated practising with openness to CAM. When graduates were asked if they included CAM in their history taking with patients, responses included:

'Of course and we always do that... this was just a natural thing to ask about these things;'

'Yes, particularly in patients who say they are on nothing... a lot of times I'll ask about any vitamins or supplemental medications... I'd say 50% of the time.'

Graduates expressed awareness of CAM practices among their patients. In addition, graduates voiced the need to learn more about CAM so they could better care for their patients. One graduate noted:

'I'm getting patients who are more reluctant to use conventional medicines because of some of the side-effects of the regular medications, so now, I'm trying to use more of [the] alternative means and I even recommended Tai Chi for the patient because she's very anxious and I told her, "You need some time for yourself." I think that would be a good exercise regimen to use for her.'

Another graduate reported:

'There are some patients out there that don't want to take the regular medication we prescribe. So then you think, "Okay, what alternative medicines can we try for them?" I really want to get to know about alternative medicines because then you get stuck if the patient doesn't want to take a lipid-lowering drug because it causes liver problems and so then what do you do next?'

Graduates commented on the absence of use of CAM among the teaching faculty:

'I have heard just different preceptors, like the ones in the private clinics, [say] that they wouldn't believe in alternative medicine;'

'I haven't noticed physicians really actively pursuing alternative medicine techniques other than occasionally.'

DISCUSSION

Given that it is widely used by the US population, health care professionals need to be informed and knowledgeable enough to discuss CAM⁹ with their patients. The question of how best to accomplish this goal remains a major challenge. Multiple suggestions, guidelines and descriptions of short courses in CAM for health care professionals do not resolve the issue of how to approach and create a curriculum change in medical school.^{2,5-7,14,15} Despite the awareness of the need to address CAM use by the general public, it is not entirely clear how one proceeds and how such changes might occur. This fundamental point was among the reasons that the NCCAM identified the need to support the development of 15 educational programmes nationwide. Integrating and adding a controversial topic such as CAM to a medical school's curriculum requires new tools and resources.

This pilot study resulted from 5 years of personal teaching experience, and educating and introducing CAM to medical school and residency leaders at 1 academic health centre. The initiative resulted in multiple educational activities. Discussions with an array of participants and leaders gave rise to a subjective perception that a change had occurred in the institutional environment and culture.

This study has tried to address one of the main specific aims of the CAM Education Project, namely: 'To evaluate educational methods and outcomes of the curriculum and describe experiences of CAM Project participants.'

Society's changing needs, advancing knowledge and innovations in education require constant changes in medical school curricula. The general issue of implementing a change in a medical school curriculum represents a major challenge for educators.¹⁶⁻²² It is an even a bigger hurdle to evaluate the outcomes of such changes. A recent systematic review of the literature describing the characteristics of successful curricular change in the professional education of doctors found a relatively small number of citations. Some authors mention certain factors that dominate the process of producing change in a medical school curriculum. These categories include: leadership; a co-operative climate; participation by organisational members; communication; evaluation; human resources development, and politics. Leadership is the factor cited most often as affecting curricular change.¹⁶⁻²² This is very similar to the findings of this pilot study. An assertive and influential leader who

communicates effectively and promotes change, as well as mobilising others to maintain the momentum of change, is validated in the literature.¹⁶ The availability of educational resources and references are other important elements for the successful integration of CAM practices for faculty members.²³⁻²⁵ The development of reliable resources that both faculty and students can utilise easily and independently was a crucial part of this educational initiative and continues to receive positive feedback. However, our study found that there were specific issues related to CAM integration in addition to these factors that cause general change in a medical school curriculum. Participant experiences of witnessing and accepting CAM approaches (visibility and openness to CAM) often depended on the presence of committed CAM team faculty. Visibility of CAM practices and witnessing of the use of CAM treatments in the conventional setting were stressed as strongly important elements for success in the process of integrating CAM into the curriculum.

In their interviews, subjects expressed increased awareness of CAM utilisation in medical practice as well as understanding of the resistance of some faculty to CAM approaches.

The process of embedding CAM issues into the curriculum resulted in an integral change in history taking practices. Students were unaware that their routine practice of asking patients about their use of herbs, nutritional supplements and CAM practices was not applied in other medical schools. This change in regular history taking appeared to have significant impact on attitudes towards CAM, an outcome that was discussed with educators from other institutions that had received R25 grant funding: what it revealed to students was that once you have asked a question, you have to deal with the answer.

Support from the NIH for this controversial initiative brought legitimacy to the project and the issues surrounding it, especially among faculty. This helped to engender the type of co-operative climate that is important for change in a medical school curriculum, a factor discussed by both Bland et al.¹⁶ and Genn.^{18,19} Another factor that supported a co-operative climate was the increased awareness of CAM practices among patients and the general public.^{1,9} The educational initiative resulted in more openness to CAM possibilities among both graduates and faculty. Scepticism and negativism were reduced considerably, resulting in a more favourable and open climate within the university environment.

Sustainability of the change is essential for the longterm success of the project. In order to sustain this change, the momentum introduced by the current leadership needs to be maintained and leadership shared with other knowledgeable and motivated faculty members. Institutional support of a champion team seems to be crucial to sustaining this process. Most participants in this study felt that without proper support and expansion, the CAM curriculum would lose its current momentum. Perhaps the greatest challenge to the sustainability of the CAM Project's curriculum initiative involves the protection of time for faculty to continue developing the curriculum, refreshing materials, including the website, and maintaining the visibility of CAM in lectures, grand rounds and other settings. Some of this has occurred through the institutionalisation of people and resources: for example, a member of the CAM team has become a course director for the Year 1 'Practice of Medicine' course and several members continue to serve on course committees, and clerkship planning and residency education teams. As the latter responsibilities represent part of these staff members' normally assigned duties, this continues the model of embedding and weaving CAM into the fabric of the university's overall educational mission. Maintaining library resources has been successfully achieved by transferring budget for the licensing of useful CAM databases to the library where they had initially been supported by the grant. Faculty development occurs on several levels. Grants and research funding in mind–body have stimulated an increase in the number of basic and clinical researchers in a CAM-related domain, as has ongoing training in mind–body methods, the healer's art, and various other mind–body techniques. CAM Project team members have continued their professional education with online and conference CME in the various CAM domains and encourage the development of residents as future faculty with exposure to such knowledge.

Clinical training such as an 'Integrative Medicine' course within family medicine training provides a visible laboratory in which CAM and integrative medicine practices are offered to patients and observed by students and residents, faculty, and visiting professors. This allows for practical application and, as such, gives an option for both care and training that did not exist in a formal way before the grant. The availability of library resources also allows clinicians who are not necessarily CAM-oriented or trained to access 'just-in-time learning' as patients raise questions about therapies, supplements, botanicals, etc.

This study has numerous limitations. It is local and specific to one medical school, which makes the findings hard to generalise to other schools and locations. Although the findings of this study cannot be generalised to all settings, the experiences and lessons learned from this specific educational project may be transferable to similar settings. The sample did not consist of a homogeneous population, representative of all medical schools about whom inferences might be made, but a small group of faculty and students who developed and experienced an innovative pedagogy that sought to integrate CAM into their own institutional environment. It is hoped that by supplying sufficient narrative data, readers may discern the feasibility of applying the conclusions to their own settings.¹³

Because this study was primarily focused on faculty and the cultural change that inclusion of CAM issues asked them to consider, it provides only a very limited medical student perspective from 4 graduates who experienced all 4 years of the revised curriculum. Larger, randomised samples of graduates and faculty in multiple locations might help to correct this weakness. Data that will emerge from similar educational initiatives, such as other NIH/NCCAM-supported academic programmes, could lead to a clearer and more consistent educational model that integrates CAM content effectively and addresses patient needs appropriately.

This type of unique educational initiative has some implications for general curricular change, which are highlighted by this study. Firstly, regardless of the kind of curricular topic proposed for inclusion (controversial or accepted), there are predictable categories of issues that will arise. Secondly, curricular change should be thought of as not only affecting student learning, but, perhaps more importantly, also affecting faculty teaching, in that it introduces a need to look beyond the specific content topics to be covered. Thirdly, curricular change in medical school is slow and modest, and even small changes in faculty behaviour should be nurtured.

In summary, this study on the infusion of CAM topics into the medical school curriculum suggests that change can occur when proper attention is given to some predictable categories of issues. Introducing CAM-related material into the medical school curriculum requires a dedicated team to cause a significant change. This change requires that CAM practices are made visible to both students and faculty, that a co-operative climate is engendered, that resources are accessible, that CAM content is

embedded into the existing curriculum, and active institutional support. All these factors combined can lead to sustainable changes in integrating CAM content issues into the medical school curriculum.

Contributors: all authors contributed to the conception and design of this study and the acquisition, analysis or interpretation of data. All authors participated in the writing of this paper and reviewed the final manuscript.

Acknowledgements: the contents of this manuscript are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health (NIH) or the National Center for Complementary and Alternative Medicine (NCCAM).

Funding: this study was supported by part of an R25 NIH and NCCAM educational enhancement grant.

Conflicts of interest: none.

Ethical approval: the study was approved by the Internal Review Board at the University of Texas Medical Branch.

REFERENCES

- Barnes P, Powell-Griner E, McFann K, Nahin R. Complementary and alternative medicine use among adults. *CDC Adv Data Rep* 2002;**343**:2004.
- Wetzel MS, Kaptchuk TJ, Haramati A, Eisenberg DM. Complementary and alternative medical therapies: implications for medical education. *Ann Intern Med* 2003;**138** (3):191–6.
- Wetzel MS, Eisenberg DM, Kaptchuk TJ. Courses involving complementary and alternative medicine at US medical schools. *JAMA* 1998;**280** (9):784–7.
- Barzansky B, Etzel SI. Educational programs in US medical schools, 2002–2003. *JAMA* 2003;**290** (9):1190–6.
- Frenkel M, Ben Arye E. The growing need to teach about complementary and alternative medicine: questions and challenges. *Acad Med* 2001;**76** (3):251–4.
- Frenkel M, Ben Arye E, Hermoni D. An approach to educating family practice residents and family physicians about complementary and alternative medicine. *Complement Ther Med* 2004;**12** (2–3):118–25.
- Marcus DM. How should alternative medicine be taught to medical students and physicians? *Acad Med* 2001;**76** (3):224–9.
- Sampson W. The need for educational reform in teaching about alternative therapies. *Acad Med* 2001;**76** (3):248–50.
- Institute of Medicine. *Complementary and Alternative Medicine in the United States*. Washington, DC: National Academy Press 2005;226–252.
- Oberbaum M, Shuval J, Haramati A *et al.* CAM in medical education: has the time come? *Isr Med Assoc J* 2005;**7**:607–10.
- Cavanaugh S. Content analysis: concepts, methods and applications. *Nurs Res* 1997;**4** (3):5–16.
- Woods L, Priest H, Roberts P. An overview of three different approaches to the interpretation of qualitative data. Part 2: practical illustrations. *Nurs Res* 2002;**10** (1):43–51.
- Lincoln Y, Guba E. *Naturalistic Inquiry*. Newbury Park, CA: Sage Publications 1985;294–331.
- Kligler B, Gordon A, Stuart M, Sierpina V. Suggested curriculum guidelines on complementary and alternative medicine: recommendations of the society of teachers of family medicine group on alternative medicine. *Fam Med* 2000;**32** (1):30–3.
- Kligler B, Lee RA. *Integrative Medicine*. New York, NY: McGraw-Hill Professional 2004.
- Bland CJ, Starnaman S, Wersal LR, Moorhead-Rosenbert L, Zonia S, Henry R. Curricular change in medical schools: how to succeed. *Acad Med* 2000;**75** (6):575–94.
- Broomfield D, Bligh J. Curriculum change: the importance of team role. *Med Teach* 1997;**31** (2):109–14.
- Genn JM. AMEE Medical Education Guide No. 23 (Part 1): Curriculum, environment, climate, quality and change in medical education – a unifying perspective. *Med Teach* 2001;**23** (4):337–44.
- Genn JM. AMEE Medical Education Guide No. 23 (Part 2): Curriculum, environment, climate, quality and change in medical education – a unifying perspective. *Med Teach* 2001;**23** (5):445–54.
- Guilbert JJ. Curriculum change and strategies, past and present: why is it taking so long? *Educ Health* 2001;**15** (3):291–3.
- Kupperschmidt BR, Burns P. Curriculum revision isn't just change: it's transition! *J Prof Nurs* 1997;**13** (2):90–8.
- Skochelak S, Barley G, Fogarty J. What did we learn about leadership in medical education? Effecting institutional change through the Interdisciplinary Generalist Curriculum Project. *Acad Med* 2001;**76** (Suppl 44):86–90.
- MD Anderson CAM Project. <http://www.mdanderson.org/departments/CIMER/>. [Accessed 12 November 2005.]
- Natural Medicine Comprehensive Database. <http://www.naturaldatabase.com/>. [Accessed 12 November 2005.]
- UTMB CAM Project. <http://cam.utmb.edu/default.asp>. [Accessed 12 November 2005.]

Received 18 January 2006; editorial comments to authors 16 June 2006; accepted for publication 23 August 2006