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Title: Evidence-based Medicine and Complementary and Alternative Medicine teaching in the UK medical courses: a national survey of the student experience

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Abstract

Background: With substantial public interest in complementary and alternative medicine (CAM), future doctors will need to provide evidence-based advice on their safety and efficacy. Informing medical students of CAM therefore becomes increasingly important.

Objectives: The objective of this study is to determine the extent and context of teaching on evidence-based medicine (EBM), and complementary and alternative medicine (CAM) in UK Medical Schools from the student perspective.

Methods: A web-based 10-item anonymous questionnaire was sent to selected UK medical students regarding their experience of teaching on EBM (including statistics) and CAM. In the questionnaire we measured the following parameters: number of lectures on EBM; number of lectures or workshops on statistics; number of lectures or availability of student selected components (SSCs) on CAM; rating of CAM teaching as critical, uncritical or discursive; quality of feedback after placements with CAM practitioners.

Results: There were 93 student responses representing 25 different medical courses. 54% had received lectures on CAM in the core course. Of these students, 46% stated the lectures were 'critical', 16% 'uncritical' and 39% 'discursive'. Of the 33 who reported on placements with CAM practitioners, 61% stated there was no feedback, 12% feedback with a specialist tutor, 15% with a non-specialist facilitator, 9% peer-led reflection, and 3% a tutor-marked written account.

Conclusions: EBM, statistics and CAM are covered by most medical schools. However, we identified areas in which CAM teaching can be improved. The survey demonstrates a need for UK curriculum coordinators to review the teaching of CAM-related components in the courses.

Keywords:

CAM; EBM; statistics; medical school; questionnaire

Background

The UK General Medical Council (GMC) sets out guidance on curriculum design for medical courses and the skills, knowledge and attitudes a newly graduated doctor should achieve. Each medical school is free to interpret the guidance as it sees fit, subject to regular visitations from the GMC. Paragraph 14b of *Good Medical Practice* 2012 (1) states that "*In providing care you must provide effective treatments based on the best available evidence*". With substantial public interest in, and use of, complementary and alternative medicines (CAM), there is a need for doctors to be informed and provide evidence-based advice on their safety and efficacy, just as with conventional treatments (2-4).

There have been initiatives from curriculum committees or Education Deans to incorporate CAM elements into the curriculum in many countries, including the United States (5-7), Canada (8), Turkey (9), Saudi Arabia (10) and Korea (11). However, while the curriculum committee sets the overall pattern of medical school teaching, it does not have detailed information on each teaching and learning activity. Perhaps more importantly, it does not, and cannot, know the context in which information is delivered. Previous surveys of medical students have focussed mainly on their awareness of various CAM therapies, their own use of CAM and the likelihood of them in recommending CAM to patients (4, 12-15). Application of evidence-based principles when delivering CAM elements is key to equip students with the skills to appraise and approach resources in evaluating CAM in future clinical practice (16-18). The context in which CAM is taught is largely unclear. This may account in part for the diverse findings from previous large surveys that show that while some doctors are cautious and sceptical about CAM without rigorous scientific evidence (19), others are less rigorous and incorporate CAM into their practice without identifying the evidence base (20). GMC guidelines suggest that 10% of the medical course is set aside for student selected components (SSCs), when students are offered a variety of optional courses which are defined as being intended to allow students to study topics of interest that go beyond the core curriculum (1).

The aim of this pilot study was to determine the extent to which evidence-based medicine (EBM), statistics and CAM are taught in UK Medical Schools, and the context in which CAM is taught.

Methods

A 10-item anonymous questionnaire was designed de novo using Survey Monkey (<http://www.surveymonkey.com>) (for template please see Box 1). This asked the student to identify their Medical School, current year of study, and whether undertaking a conventional 5/6 year undergraduate course or an accelerated 4 year graduate entry programme (GEP). In their current year of study, respondents were asked about the number of lectures in the core course on EBM, statistics (including workshops and practical classes) and CAM. They were also asked about teaching methods on CAM - lectures, SSCs, or placements – and to classify the teaching as ‘critical’ (applying the criteria of EBM), ‘uncritical’ (demonstrating the use of CAM without discussing evidence of efficacy) or ‘discursive’ (explaining why patients might choose CAM, regardless of whether or not there is evidence of efficacy). Students who reported placements with CAM practitioners were asked about the type of feedback, if any, they received from tutors or peers following the placements.

Using a list of contacts provided by the sabbatical officer at University College London Medical School, invitations to complete the questionnaire were sent to 28 presidents of medical student unions or student union sabbatical officers in April 2012. They were asked to forward the link to the education representatives for each year of their course. One president immediately forwarded the link to every student in his medical school. Nonetheless, only 12 responses were received in the first month. A second method was used at the end of May 2012. All student members of HealthWatch (n=52) and all medical students who entered the 2012 HealthWatch student prize competition for critical appraisal of clinical research protocols (n=114) were invited to complete the questionnaire and forward the link to fellow students. Responses received after 31st July, the end of the 2012 academic year, were excluded.

The authors have determined that an ethical approval is not applicable to this study, since neither confidential nor identifiable data were collected in the questionnaire.

Results

Ninety-three responses were received from 25 different medical courses. Some medical schools have both conventional 5/6 year courses and 4 year accelerated GEP; these are shown in Table 1.

The responses are shown in Table 2. Not all topics are covered in all years of the course. Although in their current year of study 10 students reported that they received no lectures on EBM, 16 none on statistics and 43 none on CAM, it was apparent from the free text comments (Boxes 2 and 3) that EBM and statistics are covered at some stage of the core course.

Regarding the type of CAM teaching, 57 students answered this question. As shown in Table 3, 46% said the lectures were ‘critical’, 16% that they were ‘uncritical’ and 39% that they were ‘discursive’.

Regarding the context of CAM teaching, 39 students said that SSCs on aspects of CAM were included in their current year of study, 36 said none were offered and 19 did not know. As shown in Table 3, 38% of respondents said that the SSCs in CAM were critical, 25% that they were uncritical and 38% that they were discursive. Free text comments on SSCs in CAM are shown in Box 2.

Only 9 students said that they were offered placements with CAM practitioners (as opposed to SSCs) in their current year of study. When asked about feedback on CAM placements (including those in earlier years of the course), as shown in Table 4, 61% said there had been no feedback, 12% that there had been feedback or reflection with a specialist tutor, 15% had feedback or reflection with a non-specialist facilitator, 9% had peer-led reflection and feedback (with or without a tutor) and 3% (one student) that there was a tutor-marked written reflective account. Two-thirds of the 30 respondents to this question (20 students) stated they received no feedback on placements with CAM practitioners. It is not clear whether or not feedback was offered. Free text comments on CAM placements are shown in Box 2.

Discussion

The principal findings of this national survey are: 1) Up-to-date 'snapshot' national surveys of medical curriculum delivery are feasible, even if more formal surveys with higher coverage would be required to draw reliable conclusions about the student experience at any individual school level; 2) EBM and statistics appear to be well covered in the UK medical courses, and there is some coverage of CAM; and 3) In at least some cases, the exposure to CAM is from practitioners who are convinced of its efficacy and lack scientific rigour, and these teaching sessions are not always balanced by critical scientific evaluation. It was surprising that so many students (60%) said they had received no feedback on placements with CAM practitioners, since most, if not all, placements include an element of feedback. It may be that many students do not recognise feedback unless it is specifically labelled as such: Completing a reflective log that is read by a tutor may not be perceived as feedback.

Previous studies on the medical curriculum in many countries have reported a diverse student awareness of CAM, their own use of CAM and the likelihood that they would recommend CAM to patients (13-15, 21, 22). However, many of these were conducted via curriculum planners or Education Deans (5-6) or focused on the importance of CAM in the curriculum (4). To the best of our knowledge, this is the first attempt to contextualise the teaching of EBM and CAM in the medical curriculum, as well as evaluating students' perception and experience of different types of CAM teaching methods.

The strength of the study is that a wide coverage of 25 courses at 23 of the 31 UK undergraduate medical schools was achieved. This was despite a low total number of respondents - although comparable to previous similar national surveys (6, 16). The focus was on a clearly delineated component of the curriculum. There are limitations relating to reliability and generalisability. The original aim was to obtain responses from all course years from all UK Medical Schools via formal student channels of medical student union officers and student education representatives. However, too few responses were obtained. The timing of the questionnaire may have been a problem - in order to capture the student experience of teaching through the year the questionnaire was sent out at the end of the academic year, when students may be preoccupied with exams. Student union officers and representatives are also coming to the end of their term of office and new representatives are being elected. As students are overloaded with questionnaires about course feedback, even when individual email reminders are sent at regular intervals it is difficult to achieve >50% response. The invitation to participate was adapted but the majority of responses were then from a group of students who were sufficiently interested in EBM either to have joined HealthWatch or entered the student prize competition for critical appraisal of clinical research protocols. Information may be biased as the students were self-selected. Results may also be unreliable if students see an SSC topic of interest to them and do not look through the whole list.

Nevertheless, uncritical teaching of CAM and a lack of critical feedback after CAM placements in some medical courses have been highlighted. The questionnaire did not ask about the students' perception of teaching of evidence-based medicine and statistics, since it was assumed that this would indeed be evidence-based and hence should be perceived as "critical" or "scientific". Students showed an appropriate appreciation of the principles of EBM and an appropriate critical view of CAM in the free text comments. The authors do not agree with those who say that CAM has no place in the medical course. A large number of patients use CAM and medical practitioners need to know enough about these therapies to give sound, evidence-based, advice (3, 7). Standards have been suggested regarding what CAM should be taught and how (18, 23). Acquiring critical appraisal skills in accessing and assessing literature resources on CAM is certainly an important part (4, 18). It is disappointing that some CAM teachers and course directors have never used the Cochrane Electronic Library (24).

Although the impact of uncritical CAM practice and practitioners in the UK medical curriculum found in this study thus appears to be slight, there may be more influence on less critical students, or those less inclined to participate in a survey. Various organisations (7, 25) have been using terms such as 'integrated' care. This may confuse students as it is normally understood to be care across boundaries such as primary and secondary care, or between statutory bodies, or between statutory and private or third sector providers (26). 'Integrated' does not mean integration between proven and unproven, effective and ineffective, or scientific and unscientific. Such efforts have been interpreted as misleading attempts to gain respectability for unproven CAM treatments (27).

Conclusion

This study shows that EBM, statistics and CAM are covered in most medical courses to different extents. It is concerning that under half the lectures on CAM, and only a third of the SSCs on CAM were critical and applied the principles of EBM. Most students reported that they received no feedback after placements with CAM practitioners. There is a need for UK curriculum coordinators to review and improve the teaching of CAM-related components in the undergraduate medicine courses.

Conflict of Interests

The authors declare that they have no financial competing interests. SB and DAB are Trustees of HealthWatch (<http://www.healthwatch-uk.org>); DH and KC are student representatives on the HealthWatch committee. HealthWatch is a small independent charity (No 1003392) that promotes evidence-based medicine and the rigorous testing of all treatments, be they conventional or complementary; consumer protection of all forms of health care, both by thorough testing of all products and procedures, and better regulation of all practitioners; and better understanding by the public and the media that valid clinical trials are the best way of ensuring protection.

Authors' contributions

All four authors contributed to the design of the questionnaire. DAB distributed the questionnaire and collated the responses; all four authors contributed equally to the analysis and interpretation of the results. All authors and only the listed authors have contributed significantly.

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DH is a FY1 Doctor at Guy's and St Thomas' NHS Trust. KC is a medical student at Barts and The London School of Medicine and Dentistry. SB is Professor of Complex Obstetrics at King's College London and Honorary Clinical Director Obstetrics, NHS London. DAB is Emeritus Professor of Nutritional Biochemistry, University College London.

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Table 1. Number of responses to the questionnaire classified by Medical School and year of study. (GEP = 4 year accelerated graduate entry programme).

Medical School	Year 1	Year 2	Year 3	Year 4	Year 5/6	Total responses by course
Barts and The London	0	0	4	0	1	5
Barts and The London GEP	1	0	2	0	NA	3
Bristol	1	0	1	6	1	9
Cambridge GEP	2	0	0	0	NA	2
Cardiff	0	0	1	0	0	1
Edinburgh	1	1	0	0	0	2
Hull-York	0	2	1	1	0	4
Imperial	2	0	0	10	1	13
KCL	1	0	0	0	0	1
Keele	1	1	0	0	0	2
Leeds	1	1	2	0	0	4
Leicester	1	1	0	2	0	4
Leicester GEP	1	1	0	0	NA	2
Liverpool	0	0	1	0	0	1
Manchester	1	0	0	4	0	5
Newcastle	1	0	1	3	1	6
Nottingham	0	1	0	0	1	2
Nottingham GEP	3	0	0	0	NA	3
Oxford	0	0	0	0	2	2
Peninsula	1	1	3	1	1	7
Sheffield	0	1	0	0	0	1
Southampton	2	0	2	1	0	5
St George's	0	1	0	0	0	1
UCL	0	2	0	1	2	5
Warwick GEP	0	1	1	1	NA	3
Total responses by year	20	14	19	30	10	93

Table 2. Number of lectures and workshops on evidence-based medicine (EBM), statistics and complementary and alternative medicine (CAM) reported by students in their current year of study.

Number of lectures	EBM	Statistics	CAM
None	10 (10.7%)	16 (17.2%)	43 (46.2%)
1 - 3	36 (38.7%)	41 (44.0%)	44 (47.3%)
4 - 6	21 (22.6%)	17 (18.3%)	4 (4.3%)
7 - 10	12 (12.9%)	8 (8.6%)	4 (4.3%)
> 10	16 (17.2%)	13 (13.9%)	0 (0%)
Total	93	93	93

Table 3. The student perception of lectures and student-selected components (SSC) in complementary and alternative medicine (CAM).

	Lectures on CAM n (%)	SSCs in CAM n (%)
Critical (applying the criteria of evidence-based medicine)	26 (45.6%)	12 (37.5%)
Uncritical (demonstrating the use of CAM without discussing evidence of efficacy)	9 (15.8%)	8 (25%)
Discursive (explaining why patients might choose CAM regardless of whether or not there is evidence of efficacy)	22 (38.6%)	12 (37.5%)

Table 4. Student reported feedback on placements with CAM practitioners

Feedback on placements with CAM practitioners	Responses n (%)
No feedback	20 (60.6%)
Feedback / reflection with a specialist tutor	4 (12.1%)
Feedback / reflection with a non-specialist facilitator	5 (15.2%)
Peer-led reflection and feedback	3 (9.1%)
Tutor-marked written reflective account	1 (3.0%)

Box 1. Questionnaire template

1. HealthWatch is a small charity that supports evidence-based medicine and rigorous testing of all therapies, be they conventional or complementary and alternative.

Good Medical Practice 2012 paragraph 14b states that "In providing care you must provide effective treatments based on the best available evidence". It is, however, obvious that doctors need to know about complementary and alternative treatments, since many of their patients will use or ask about them.

The purpose of this questionnaire is to find out how much exposure there is in undergraduate medical courses to CAM, and the context in which it is taught.

Please enter the name of your medical school and whether you are answering about an undergraduate entry 5 / 6 year course or a 4 year accelerated graduate entry course. If your medical school offers both, please complete a separate questionnaire for each year of each course

2. Which year of the course are you answering this questionnaire about

<input type="checkbox"/> year 1
<input type="checkbox"/> year 2
<input type="checkbox"/> year 3
<input type="checkbox"/> year 4
<input type="checkbox"/> year 5
<input type="checkbox"/> year 6
add any comments here

3. In the core course, excluding student-selected components, how many lectures are there in the year on evidence-based medicine?

<input type="checkbox"/> none
<input type="checkbox"/> 1 - 3
<input type="checkbox"/> 4 - 6
<input type="checkbox"/> 7 - 10
<input type="checkbox"/> more than 10
add any comments here

4. In the core course, how many lectures and practical classes / workshops are there on statistics in the year?

<input type="checkbox"/> none
<input type="checkbox"/> 1 - 3
<input type="checkbox"/> 4 - 6
<input type="checkbox"/> 6 - 10
<input type="checkbox"/> more than 10
add any comments here

5. In the core course, how many lectures are there on complementary and alternative medicine in the year?

none

1 - 3

4 - 6

6 - 10

more than 10

add any comments here

6. Are these lectures on complementary and alternative medicine

critical (i.e. applying the criteria of evidence-based medicine)

uncritical (i.e. demonstrating the use of CAM without discussing evidence of efficacy)

discursive (i.e. explaining why patients might choose CAM regardless of whether or not there is evidence of efficacy)

add any comments here

7. Are there student-selected components on complementary and alternative medicine offered in the year?

yes

no

don't know

8. Are these student-selected components on complementary and alternative medicine

critical (i.e. applying the criteria of evidence-based medicine)

uncritical (i.e. demonstrating the use of CAM without discussing evidence of efficacy)

discursive (i.e. explaining why patients might choose CAM regardless of whether or not there is evidence of efficacy)

add any comments here

9. Are there clinical placements with CAM practitioners in the year

yes

no

don't know

add any comments here

10. What feedback / reflection is there after placements with CAM practitioners? (tick as many options as are relevant)

no formal feedback / reflection

- feedback and reflection led by a specialist tutor*
 - feedback and reflection led by a non-specialist facilitator*
 - peer-led (student-led) feedback and reflection*
 - a peer-marked (student-marked) written reflective account*
 - a tutor-marked written reflective account*
- add any comments here*

Box 2. Summary of free text comments on the course structure

Evidence-based medicine (EBM)

- Usually in early years of the medical course, especially the first year
- Teaching methods include lectures, SSCs, and problem based learning
- EBM is also mentioned in most lectures by clinical lecturers

Statistics

- Usually throughout early years of the course
- Mainly taught through workshops
- Some courses have refresher in 4th year

Complementary and alternative medicine (CAM)

- Very diverse provision among different medical courses
- Including: No lectures solely dedicated to CAM; 2 essays as compulsory part of year 1; Scholarship essay year 1; Component module year 2; Optional module choice year 3; 2-week CAM module in year 4
- Format of teaching is also very diverse, including: Mini-lecture series; Intensive 5 days on multiple aspects on CAM, including small research project and presentation
- Content is often a mixture of critical and discursive

Box 3. Free text comments on CAM by medical students

<p style="text-align: center;">CAM lectures in the core course</p> <p><i>"We had a single lecture that looked at the big four complementary therapies and covered, briefly, how each of them work and some of the rules and regulations that go along with them."</i></p> <p><i>"Not dedicated lectures. Alternative and complementary medicine come up in several strands of the course, but are touched upon in those lectures, rather than receiving their own lectures."</i></p> <p><i>"There are also two essays, each a compulsory part of the course and each contributing to the final year grade of Year 1 which assess aspects of appreciation of CAM!"</i></p> <p><i>"It was an optional module choice in year 3."</i></p> <p><i>"There is a 2 week CAM module at the start of the fourth year"</i></p> <p><i>"Intensive 5 days on multiple aspects on CAM - including small research project and presentation"</i></p> <p><i>"We had one day of CAM lectures, all run by pro-CAM lecturers. Most other lecturers seem ambivalent or negative towards CAM, but give us no lectures on it."</i></p> <p><i>"There was a scholarship essay on CAM on entry to year 1"</i></p> <p><i>"A component of a module in second year"</i></p> <p><i>"In my opinion, CAM has no place in a medical school curriculum. It is unscientific, based on spurious and often non-existent evidence, and its continued presence is harmful to public understanding of science and medicine. Furthermore, CAM practitioners often actively discourage conventional medicine - for example, a study by Ernst and colleagues showed that over half of UK homeopaths would discourage patients from taking the MMR vaccine - despite the fact that all scientific evidence points to its safety and efficacy! Therefore, I believe that medicine should focus on science, and that the need for evidence-based medicine excludes CAM."</i></p> <p><i>"The lecture attempts to be critical however I felt that it still overstated the claims and used older papers as proof where newer, more rigorous papers may show an inefficacy."</i></p> <p><i>"They were critical, however the evidence shown in the lecture was, in my opinion, of dubious quality."</i></p> <p><i>"As far as I can remember, all 3 of these elements were discussed, particularly the last 2. Emphasis on the discursive though."</i></p> <p><i>"Lectures are both discursive and critical; we are taught to critically appraise any treatment, including CAM, but also appreciate the needs of the patient and their choices."</i></p> <p><i>"A mixture of the above. We have some lectures/placements explaining different CAM treatments and what they involve, some discussing the evidence, and a lot by complementary medicine practitioners that are not critical."</i></p> <p><i>"Part of a mini lecture series entitled "Social Context of Health and Illness". Taught by a postdoc anthropologist from an anthropological/sociological perspective rather than a scientific/clinical viewpoint."</i></p> <p><i>"Most students stopped listening when they discovered the lecturer was a homeopath."</i></p>
<p style="text-align: center;">CAM in SSCs</p> <p><i>"As far as I know the acupuncture [sic] SSC was uncritical, however I myself did not take the SSC"</i></p> <p><i>"Here is the synopsis from the medical school website: This SSC will offer a brief history of Chinese medicine, and an overview of its underlying theories, its research base, and the organisation of the profession in the UK. However, the main focus will be to examine commonly presenting conditions using the perspectives provided by Chinese medicine. The SSC will include lectures, demonstrations, group exercises and practical sessions, and students will be expected to complete a written case-based assignment."</i></p> <p><i>"I completed a SSC in hypnotherapy in year 1. It was taught by practitioners of hypnotherapy and they were keen to stress the efficacy of their technique. I'm sure there are other SSCs available but I cannot recall them."</i></p> <p><i>"There are no SSCs but there is an option to visit an osteopath as a sign-up on our medical school website"</i></p>
<p style="text-align: center;">CAM placements</p> <p><i>"I did not have a CAM placement, but a number of different CAM practitioners came and gave us an insight into their profession and more information about it. We then had a workshop where we discussed what we learnt from that session and from the lecture with some cases."</i></p> <p><i>"I had an afternoon with a chiropractor."</i></p> <p><i>"I feel that it is essential that medical students are taught about CAM, as patients will ask their doctors about it. However, much of our teaching is extremely biased towards CAM. My perception is that we have more talks by biased CAM practitioners telling us their opinions, than we do teaching about evidence based practice. I believe this is a problem."</i></p>

“Optional if individuals wish to arrange - I don't know of anyone who did.”
“Some people get placed with GPs who also do CAM”