Introduction

Integrative medicine (IM) is an approach to the practice of medicine that makes use of the best-available evidence, taking into account the whole person, including all aspects of lifestyle\(^1\). IM includes orthodox approaches as well as complementary and alternative medicine (CAM) and encompasses a model focused on prevention, wellness, and healing\(^2\). IM adopts a humanistic, partnership approach to care with an emphasis on providing the patient with hope, education and therapeutic approaches that match the individual’s global perspective\(^3\).

CAM therapies may be based on substances, nutrition, manipulation, exercise, and mind-body interactions\(^4\). They are not considered part of conventional medicine because of insufficient scientific evidence of their effectiveness. Despite this, use of CAM does not appear to be confined to any particular socioeconomic group, and is common in underserved populations\(^5\).

In the US, yearly visits to alternative practitioners had increased to 629 million visits by 1997, exceeding total visits to all primary care physicians\(^5\). A later study showed that almost 4 out of 10 adults had used CAM therapy in the previous 12 months\(^6\). An Australian study demonstrated

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**Short Report**

**Attitudes of medical students toward the practice and teaching of integrative medicine**

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**ABSTRACT**

The General Medical Council encourages the integration of complementary and alternative medicine (CAM) teaching into basic medical education. We wished to explore the attitudes of medical students to CAM and its inclusion in their undergraduate curriculum. Medical students were invited to complete the validated Integrative Medicine Attitude Questionnaire (IMAQ) and to state whether they considered it appropriate for them to learn about CAM in medical school. The questionnaire was completed by 308 students (65.8\% response rate). CAM had been received by a majority of respondents and their families. Participants believed that doctors with knowledge of CAM provide better patient care and that it is desirable for physicians to exploit the placebo effect. Most students expressed the view that doctors should be able to answer patients' questions about herbal medicines. There was a belief that patients should be warned to avoid using supplements which have not undergone rigorous testing. Students who were current or previous users of CAM or whose family members used CAM had higher total IMAQ scores and openness subscale scores than those who did not report use of CAM. Two-hundred and nine (68\%) students expressed a desire to study CAM as part of their medical curriculum. This study reveals a positive attitude towards a holistic approach to patient care which embraces CAM. Medical students believe that integrative medicine should be taught in medical school.

**Keywords:** attitude of health personnel; students, medical; complementary therapies; education

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that the estimated number of visits to CAM practitioners by adults in the 12-month period was almost identical to the estimated number of visits to medical practitioners[7]. Reasons cited for the increase in popularity of alternative therapies include dissatisfaction with conventional health care, which is reported by patients as ineffectual, expensive, or overly focused on curing disease rather than maintaining good health[7].

Currently, CAM is not well represented in undergraduate medical curricula in Europe. There is a need to develop successful strategies to evaluate both medical student and physician attitudes towards CAM and to incorporate information about CAM into already congested health professional curricula[8]. This study was designed to explore the attitudes of medical students toward IM and to evaluate their level of interest toward the introduction of CAM into their curriculum. Students’ attitudes toward CAM have been shown to be influenced by a number of factors including gender, age, race, and whether students had previously visited a CAM practitioner[9-10].

2 Methods

2.1 Study design and data collection
The study was carried out using a web-based survey of medical students in five-year groups of our medical school. The students were sent an email inviting them to complete an anonymous electronic survey exploring their attitudes towards CAM. At the time these data were collected there was no CAM included in either the core or elective undergraduate medical curriculum of this institution.

2.2 IMAQ questionnaire
The questionnaire distributed was a modified version of the previously validated Integrative Medicine Attitude Questionnaire (IMAQ)[10]. IMAQ is a 29-item, 7-point Likert scale-rated instrument. A total integrative medicine attitude score is created by summatting the responses to each item. Sixteen of the questions were positive statements and thirteen were negative. A maximum score of 203 is possible using this instrument. A two-factor model was used based on the factor analysis which yielded Cronbach alpha coefficient values of 0.91 and 0.72, respectively; (1) openness to new ideas and paradigms; and (2) value of both introspection and relationship to the patient[10]. Maximum possible scores for the openness factor and the value of introspection and relationship factors were 147 and 56, respectively.

The modified IMAQ questionnaire also collected further demographic data about the students’ age, gender, race, whether they had used CAM previously or been cared for by a CAM practitioner, and whether any member of their family had ever used any CAM therapies. Results were expressed as medians with interquartile ranges and a Kruskall-Wallis test was used to test for significant associations between selected variables.

3 Results

3.1 Demographics
A total of 308 out of 468 (response rate 65.8%) students completed the questionnaire, 57.5% of whom were female. Seventy-two percent (n = 223) of the respondents were of Irish nationality, with Malaysian students comprising the majority of the international cohort (22.7%, n = 70). Nearly two-thirds of students who responded reported family use of CAM (62%, n = 191), while fewer than half of students surveyed declared that they personally used CAM (42.5%, n = 131).

3.2 IMAQ scores
There were no significant differences between the students’ particular year of study or nationality with total or subscale IMAQ scores (Table 1). There was a non-normal distribution of total IMAQ score, with a median score of 128 and interquartile range of 19. Participants scored higher in the “relationships” subscale (median = 43; 77% of maximum score) than the “openness” subscale (median = 90; 61% of maximum score). There was a statistically significant difference in the gender difference observed on the “openness” subscale (male median = 88, interquartile range 18; female median = 92, interquartile range 14.5; P < 0.05), but not on the “relationships” subscale (male median = 43; female median = 42).

Students who were current or previous users of CAM or whose family members used CAM had higher total IMAQ scores and “openness” subscale scores than those who did not report personal or family use of CAM. Two-hundred and nine (68%) students expressed a desire to study CAM as part of their medical curriculum. Figure 1 shows that students who had higher total IMAQ scores (median = 136.7) were more likely to express a desire to study CAM in their undergraduate medical curriculum than those who had lower total IMAQ scores (median = 123.7, P < 0.05).

3.3 Individual IMAQ item scores
Students were more positive than negative (i.e., median item score ≥ 5) in relation to the following individual IMAQ items: knowledge of multiple medical systems; patient spirituality and healing; acupuncture in patients receiving chemotherapy; end of life care; placebo effect; healing in incurable diseases; physicians modelling balanced lifestyles; quality of life measures in research; personal change and growth of patients; innate healing of patients; acupuncture in patients receiving chemotherapy; placebo effect; healing in incurable diseases; and nutritional counselling. Few items were rated more negatively than positively by the medical students (i.e., median item score
There has been a gradual increase in the reported use of CAM by members of the public over the last few decades\(^{41}\). This descriptive study examined the attitudes of undergraduate medical students towards the use of CAM, the relevance of IM, and their incorporation into the medical curriculum. The response rate was satisfactory and was representative of the approximate distribution of Irish and non-Irish medical students at our university. There was no difference in IMAQ scores between pre-clinical and clinical medical students or between Irish and international students. A previous study in the UK found that junior medical students were more positive toward CAM and its instruction than senior medical students\(^{12}\). Schmidt and colleagues\(^{9}\) found a racial difference in their study of medical students’ attitudes toward holism, with Caucasian students being more favourable towards it than Asian or black students. The authors concluded that Asian students choosing to study medicine may be more likely to reject traditional therapies associated with their native cultures in favour of Western allopathic medicine.

Levels of personal and family exposure to CAM were high in our study and positively correlated with total and openness subscale scores using the IMAQ questionnaire. Greiner and co-workers\(^{13}\) estimated CAM use among medical students at between 40% and 74%. Shankar and colleagues\(^{14}\) demonstrated a higher openness score among Nepalese medical students whose families used both CAM and allopathic therapies.

In the present study, female students scored higher on the openness subscale of the IMAQ questionnaire. Rees and co-workers\(^{15}\) found that students who expressed more positive views towards holistic patient care were more likely to be female and that their attitudes towards CAM became more positive over time. The majority of items on the IMAQ questionnaire were rated as more positive than negative by the medical students, indicating a favourable attitude towards the use of CAM and its integration into patient care.

Over two-thirds of students wished to see the introduction of IM into their medical studies, and special study modules were identified as the preferred means of introducing it to students. The UK General Medical Council advocates that medical graduates should show an awareness of the range of complementary therapies available to patients and the evidence for their use\(^{16}\). CAM now features in most American medical school curricula\(^{17}\). Providing students with a background in CAM may give them a better insight into their patients’ motivation for using complementary therapies and will equip them to address their patients’ questions regarding these treatments\(^{18}\).

We propose that medical school curriculum committees should give consideration to the integration of CAM into their spiral curricula at multiple levels, including in discussions on patient autonomy in ethics modules,
patient empowerment in discussion of health promotion approaches, and evaluating the medical literature in evidence-based medicine modules. Ideally CAM should appear as an adjunct to existing core material in the clinical phase of the curriculum, where evidence-based CAM therapies should be introduced to students in relation to common clinical problems.

Medical students believe that integrative medicine should be taught in medical school. While this is a cross-sectional study in a single site, the satisfactory response rate, and the mix of indigenous and international students of both genders adds to its generalisability. Future studies should evaluate the effectiveness of student-selected components as an educational tool to introduce medical students to IM and should compare their experiences with the approaches of medical schools which have embedded IM into their core curricula.

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6 Competing interests

The authors state that they have no competing interests.

REFERENCES


Submission Guide

Journal of Integrative Medicine (JIM) is an international, peer-reviewed, PubMed-indexed journal, publishing papers on all aspects of integrative medicine, such as acupuncture and traditional Chinese medicine, Ayurvedic medicine, herbal medicine, homeopathy, nutrition, chiropractic, mind-body medicine, Taichi, Qigong, meditation, and any other modalities of complementary and alternative medicine (CAM). Article types include reviews, systematic reviews and meta-analyses, randomized controlled and pragmatic trials, translational and patient-centered effectiveness outcome studies, case series and reports, clinical trial protocols, preclinical and basic science studies, papers on methodology and CAM history or education, editorials, global views, commentaries, short communications, book reviews, conference proceedings, and letters to the editor.

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