

Impact of the Integrative Medicine Elective on Medical Students

A Thesis submitted to The University of Arizona College of Medicine-
Phoenix in partial fulfillment of the requirements for the
Degree of Doctor of Medicine

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2011

This work is dedicated to August for his infallible happiness and unconditional love and support.

Acknowledgements

I would like to thank Victoria Maizes, M.D. for the opportunity to participate in this research. I would also like to thank Paula Cook for her generous support and guidance throughout this project. I also extend thanks for Howard Silverman, M.D. for introducing me to Dr. Maizes.

Abstract

Background: Integrative Medicine offers an approach to medical practice which addresses the public's increasing use of complementary and alternative medicine (CAM), personal, professional, and federal calls for more patient-centered care, and medical professionals' deficiencies in self-care and reflection. Though the need for exposure to IM in medical school has been well articulated and many schools offer exposure to the field, the impact of such experiences is largely unknown. The University of Arizona's Center for Integrative Medicine (AxCIM) re-designed its month-long elective in 2004 to better introduce students to the discipline. This paper reports the preliminary findings of a study examining changes in medical students' attitudes about IM after participation in this elective.

Methods: The Integrative Medicine Attitudes Questionnaire (IMAQ) was administered to medical students participating in the AzCIM's bi-annual, month long IM elective at the beginning of the elective, at the end, 6 months after completion and 1 year after the elective. **Results:** 66 complete IMAQ scores were collected at baseline, 36 six months post-elective and 23 1 year after. Post-elective scores were significantly higher than at baseline. No difference from baseline was found in scores 6 months and 12 months post-elective. **Conclusions:** The preliminary results are encouraging regarding the elective's improving attitudes toward IM immediately after its completion. This study serves as a resource and encouragement for IM education assessment and evaluation.

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Introduction

Background

American healthcare's historical emphasis on technological advances and acute, episodic care has created dissatisfaction among patients and physicians, bringing to light the need for a new medical model. Patients are seeking other avenues for wellbeing reflected in the growing use of complementary and alternative medicine (CAM). The National Health Interview Survey, an annual in-person survey of almost 35,000 Americans regarding health- and illness-related experiences, reported 38% of adults and 12% of children used some form of CAM in 2007, an increase from previous measurements in 2002. (1) The Cochrane Collaboration defines CAM as "a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period." (2) Americans surveyed reported spending \$33.9 billion out of pocket on various CAM modalities.

The majority of patients, however, do not disclose their use of CAM therapies with their primary care physicians. (3) Though most people use CAM in conjunction with Western biomedical therapy, patients are using CAM to fill deficiencies in conventional care. (4) CAM approaches are used to relieve symptoms of chronic illness or side effects of conventional treatments. (5-7) Many also value CAM practitioners' recognition of an individual's physical, mental, spiritual, and social circumstances as well as empowerment to be involved in their own health. (8-10)

Patients' appreciation of and desire for the holistic care they receive in CAM is echoed in *Crossing the Quality Chasm*, an Institute of Medicine report calling for patient-centered care (PCC). (11) PCC focuses on prevention strategies, treatment recommendations, and decision-making based upon patient preferences and beliefs. Research indicates that PCC's principles are lacking in most conventional practices. When applied, PCC leads to improvements in patient and practitioner satisfaction, lower malpractice rates, reduced utilization of care, and improved patient health status. (12-16)

The field of integrative medicine (IM) has emerged from professionals and patients calling for a broader health paradigm and

better health outcomes. IM incorporates elements of CAM and PCC into a conventional medical model creating a higher-order philosophy to provide the safest, most cost-effective preventions and treatments within a therapeutic partnership between patient and provider. IM also emphasizes the biological, psychological, social, and spiritual wellness of both parties. (17-19)

Though many aspects of IM are drawn from allopathic practice and CAM, this last point is unique to the discipline. Physician self-care and introspection are fundamental to the practice of IM. Certainly, as reflected by the Medical School Objectives Project, physicians should demonstrate “compassionate treatment of patients[,]. . . the capacity to recognize and accept limitations in one’s knowledge and clinical skills. . . [and] honesty and integrity in all interactions with patients’ families, colleagues and others with whom they must interact in their personal lives.” (20) Thus, the need to teach physicians in training how to cultivate their own health and to preserve the humanistic significance of their work should follow from these stated fundamentals of medical practice.

Many medical students acknowledge the importance of physicians’ attendance to personal wellness, balance, and self-awareness in forming therapeutic relationships with patients. (21) In spite of this, conventional medical training and professional life often involve individuals sacrificing their own wellbeing. (22-24) Medical students and residents often have high levels of stress, financial concerns, exposure to patient suffering, decreased quality of relationships and outside interests, and poor health behaviors. (25) A literature review of peer-reviewed research from 1980 to 2005 of 40 articles suggested a consistently high prevalence of depression and anxiety among medical students, their levels of overall psychological distress are consistently higher than in the general population and age-matched peers by the later years of training. (26) Such distress impacts not only physicians’ health but their ability to care for patients. By training medical students to focus on their own health, IM creates physicians better equipped to help foster the same in their patients. (27, 28)

Significance

IM is a promising model for competent and compassionate healthcare. (23, 29) The federal government has recognized this and placed an emphasis on IM education. In 2009, the Senate Committee on Health, Education, Labor, and Pensions held a hearing on “Integrative Care: A Pathway to a Healthier Nation” in which Senator Tom Harkin spoke with Drs. Mehmet Oz, Mark Hyman, Dean Ornish, and Andy Weil about the importance of instruction in and access to IM and its potential incorporation into US health care reform. (30) All testimonies advocate for IM education and training in medical school, residency, and beyond to improve patients’ health, to reduce costs, and to advise the federal government. The hearing coincided with an Institute of Medicine Summit on Integrative Medicine and the Health of the Public Agenda which featured a panel on workforce and education. (31)

Given Americans’ use of CAM, IM’s potential to enhance well-being of medical practitioners, and the increasing likelihood of IM’s incorporation into health care on a national level, medical students need exposure to and training in the discipline. American medical students and residents now have access to IM electives. The experience in such electives varies and may include didactic sessions, visits to complementary and alternative practitioners, patient conferences, self care experiences, and scholarly projects. Research on their impact on knowledge, attitude, skills, and behaviors of students is in its infancy however. (32, 33)

The National Center for Complementary and Alternative Medicine awarded 15 academic institutions grants between 2000 and 2002 to develop IM curricular initiatives to explore instruction formats and evaluation methods. The Consortium of Academic Health Centers for Integrative Medicine (CAHCIM) proposed core competencies for IM undergraduate medical education in 2004. (32) Efforts to educate medical students about CAM/IM should improve students’ abilities to utilize evidence-based medicine principles to evaluate IM approaches, attitudes about IM, and personal growth. The report emphasizes the importance of evaluating curricula using specific IM assessment instruments to assess student competency and to track learning in those areas.

Aims

The University of Arizona's Center for Integrative Medicine (AzCIM) has offered a four week elective to fourth-year medical students and residents since 1997. (34) In the past, the rotation was available to only three or four students. In 2004, the elective was redesigned to follow the CAHCIM competencies as a bi-annual immersion experience for fifteen. Students self-refer through word of mouth, IM interest groups at their medical schools, articles about the program in journals, the program's website, etc. There are no eligibility or academic criteria for participation, but the elective does receive more applicants than it can accommodate. University of Arizona students have first priority. Enrollment to other students is offered based on the order in which applications are received.

Over 200 medical students and residents have participated to date with medical students composing the majority. Experiences include shadowing at the IM clinic, lectures with structured reading, patient conferences, exploring self-care practices, experiential learning with CAM providers, and an oral presentation on an IM subject to faculty and IM fellows.

The purpose of this project is to assess the immediate and long-term impact of this restructured IM elective at the University of Arizona on medical students' knowledge, skills, and attitudes about IM as well as their self-care behaviors, experiences or personal transformation and personal changes in wellbeing, balance, and health.

Research Materials and Methods:

Medical students and residents were asked to complete the IMAQ and the Four Worlds Self-care Assessment (FWSCA) during the first meeting of the AzCIM elective beginning in fall 2004 (about 15 students per fall or spring). Data collected at this time represents the baseline. This study will stop collecting data in fall 2011. Participation was strictly voluntary and students received no compensation. Participants were also asked to complete a Program Evaluation Rating Scale as well as to submit a their own version of the Hippocratic Oath by the end of the elective.

At end of the final day of the elective, participants again responded to the IMAQ and FWSCA instruments. Following completion of the rotation, alumni (participants in this study) were

mailed the IMAQ at six and twelve months post-rotation completion. They were instructed to respond to the questions in a manner that reflected current thinking, use of the rotation information, or current attitudes about IM/CAM. They were asked to return these questionnaires by mail in a provided, self-addressed, stamped envelope. Students' responses were assigned codes to deidentify the data. This study received IRB approval from the University of Arizona.

IMAQ

The Integrative Medicine Attitudes Questionnaire (IMAQ) was conceived and developed to explore attitudes toward holism in health care providers and medical students. (35) The IMAQ is a 29-question survey with 7-point Likert scale scoring. Its items were originally validated among a heterogeneous sample of health professionals and recently validated for use in longitudinal studies. (36) IMAQ questions can be viewed at

www.mmc.org/workfiles/mmc_residencies/attitude+quest.pdf. It has been used in IM research since development. (21, 33, 36, 37) The IMAQ and FWSCA are the only components of the study repeatedly measured before and after completion of the elective. The IMAQ is the only validated measure used in this study, and attitudes towards various aspects of IM. The FWSCA is a non-validated measure of introspection and balance adapted from pastoral counselor Howard Clinebell's Intentional Family Method Self-Care Assessment . As the goal of this study was to assess the longitudinal impact on medical students' attitudes about the entire field of IM, only IMAQ scores were analyzed for this preliminary data analysis.

Data analysis

Data were stored, managed, and analyzed at the University of Arizona using Microsoft Excel. As medical students comprised 73% of respondents (66 of 91), only medical student data was analyzed to isolate any potential findings to that population. Any sets of questionnaires missing data were excluded from the totals. This led to the exclusion of 1 survey from baseline data, 4 from end of the elective data, and 2 from 6 months post-elective data.

Necessary questions were reverse-coded and total IMAQ scores were calculated for each medical student for whom data had been collected 6 months and 1 year after completion of the elective. A personnel turnover led to the loss of 6 and 12 month post-elective data

after the spring of 2007, thus all data presented in this paper reflects elective participants from fall 2004 to spring 2007. Totals were then aggregated by time in relation to post-rotation completion: baseline, end of elective, six months post and twelve months post. Mean scores and 95% confidence intervals were calculated for each data collection time. One-way analysis of variance (ANOVA) was calculated to assess IMAQ score differences between the 4 time points.

Results

65 complete IMAQ scores were recorded from medical students at baseline. Six months after completion of the elective, 36 of the IMAQs were returned, 55% of the initial respondents. 23 surveys, 35% of initial, were returned at one year. Higher IMAQ totals indicate a more favorable attitude toward IM. (Scores can range from 29 to 203.) Mean IMAQ scores by time are reported in Figure 1. Baseline scores had the lowest mean. The mean of scores at the end of the elective were significantly higher. A significant difference was found in students' scores by ANOVA, the results of which are reported in Table 1 (F critical = 2.66, P=0.00189).

Figure 1. Means of Total IMAQ Scores by Time. Error Bars Represent 95% Confidence Interval.

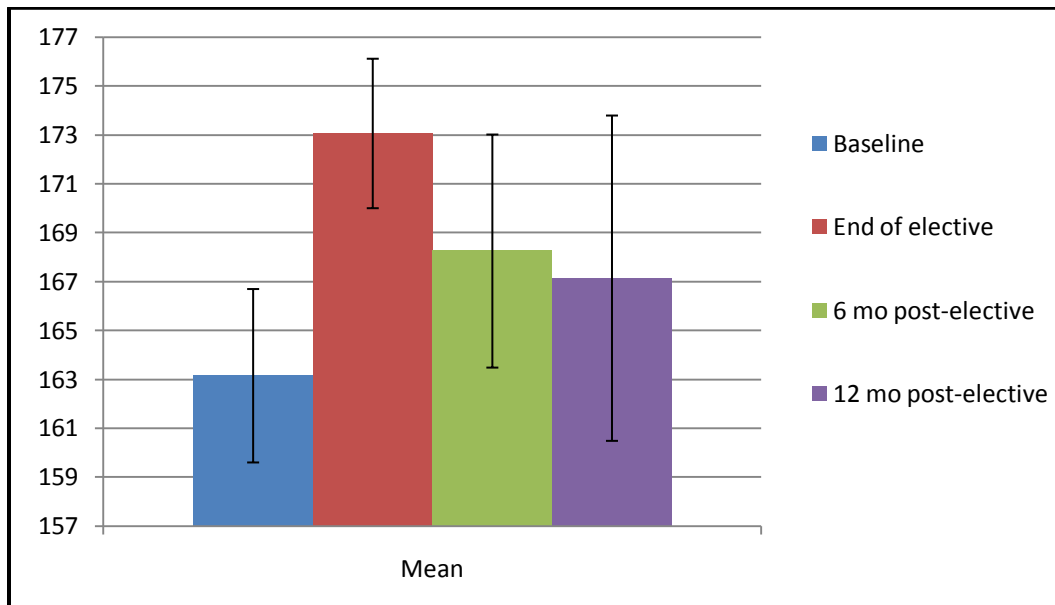


Table 1. Single Factor Analysis of Variance of Total IMAQ Scores by Time from Elective

Time	N	Mean Score		Variance
Baseline	65	163.2		217.9
Post-elective	59	173.1		143.5
6 mo-post	36	168.3		212.9
12 mo-post	23	167.2		265.0
Source	Df	SS	MS	F
Between groups	3	3052.5	1017.5	5.17 (P <0.5)
Within groups	179	35230.2	196.8	
Total	182	43149.6		

Discussion

Analysis of longitudinal IMAQ data demonstrated a more favorable attitude and greater acceptance of IM immediately after fourth year medical students participated in the AzCIM elective. Results at this time demonstrated the least variance as well. The elective had a similarly positive effect on all participants. This is especially significant considering that students come from varied backgrounds and medical schools. Though the author was unable to access the exact number, anecdotal reports indicate that students from up to 30 different medical schools have participated in the elective. However, the effect was no longer present 6 months after its completion and persisted at 1 year post-elective.

Despite the elective's short-lived effect on improving IM perception, IMAQ scores did not regress to levels below baseline 6 mo and 1 year after. This is significant as all medical students surveyed were in their fourth year. Depending on whether or not they attended the spring or fall elective, half would have been in residency when completing the 6 months-post elective IMAQ. All would be 1 year after completion assuming that survey participants followed the traditional path of entering residency after medical school. Residency and particularly the demands of its first (intern) year are notoriously stressful as interns usually have the smallest knowledge base, lack efficiency, and are transitioning to a different hospital services at least monthly. This could explain why the largest variance was recorded 1 year post-elective. That interns retain a generally favorable attitude towards holism, IM treatments, introspection and self-care is positive.

Limitations

The IMAQ's ability to assess attitudes about IM over time has been statistically substantiated. However, it has not been tested for correlation to behavioral changes and thus the clinical relevance of IM's impact on practice are unknown even if results had shown a lasting increase in total IMAQ scores. The IMAQ was also validated using physicians and residents in practice and thus might not be as applicable to impacts of medical student education. The other measure of the study, the Four Worlds Self-care Assessment, would provide a better measure of elective participants' self-care habits over time.

Furthermore, this study experienced significant loss to follow up. Half of the data collection relied upon participants receiving, completing, and mailing back questionnaires. This is particularly problematic considering the likelihood that participants no longer resided at their medical school addresses 6 or 12 months after attending the elective. These factors may have resulted in sample sizes too small to show any real effect for 6 month and 12 month post-elective data.

A third limitation is that the study population is not a random sampling of medical students. Students self-select and apply to take this course, some traveling from other parts of the country to attend. Thus, their impressions of IM may be more positive than the general undergraduate medical population due to their interest in the field.

Future Directions

This study will continue through the fall 2011 elective. The addition of more 6 and 12 month post-elective data should add to the power of the study. Final results are hoped to more definitively show the impacts of the elective on attitudes about IM. At completion of the study, medical student data could be compared to resident data to ascertain differences between the elective's effects on medical professionals at different stages in training. Also, as mentioned earlier, students who complete the elective in the spring may represent a different group than those who take it in the fall secondary to the effects of residency. These avenues should be explored.

Yet, this is not the only way of evaluating the elective's impact on participants. Analysis of the FWSCA data could allow assessment of the elective's impact specifically on medical students' issues of balance and wellness. Many authorities in the field encourage more experiential and qualitative assessments for measuring learner

outcomes. (32, 38) One-on-one interviews or focus groups with participants could be conducted to deepen understanding of the elective's impact on participants. Also, as data regarding the effects of IM undergraduate medical education on actual practice behaviors is largely unknown, observations of student behaviors with simulated patients or encounters with standardized patients could be informative.

Conclusions

IM's philosophy holds the potential to address many of the deficiencies in American healthcare experienced by patients and the medical professionals providing their care. Though medical students require exposure to the field, it remains to be determined which curricular models are most effective. Medical students' responses to the IMAQ in this paper reinforce the importance of evaluating IM educational initiatives. The increase in IMAQ scores at the end of the rotation is an encouraging finding. The elective appears to be achieving its goals in the short term. The long term results we observed may echo the stability of IM attitudes found in another longitudinal study using the IMAQ. (36) More data are needed to confirm these findings.

IM education is a necessary component of medical education. Any educational initiatives should teach students to view patients' holistically, evaluate, be open to, and potentially to employ all of the wellness modalities available including CAM, and to practice reflection and self-care. Rigorous evaluation of the success of IM curricula is an essential component of helping IM become mainstream and restoring positive, therapeutic physician-patient relationships in American healthcare.

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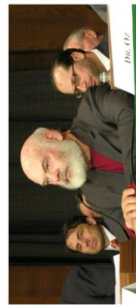
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Background

Integrative Medicine offers an approach to medical practice which addresses the public's increasing use of complementary and alternative medicine (CAM), personal, professional, and federal calls for more patient-centered care, and medical professionals' deficiencies in self-care and reflection. Though the need for exposure to IM in medical school has been well articulated and many schools offer exposure to the field, the impact of such experiences is largely unknown. The University of Arizona's Center for Integrative Medicine (AzCIM) re-designed its month-long elective in 2004 to better introduce students to the discipline. This paper reports the preliminary findings of a study examining changes in medical students' attitudes about IM after participation in this elective.



Senate Committee on Health, Education, Labor, and Pensions hearing on "Integrative care: a pathway to a healthier nation," February 16, 2009.

Methods

The Integrative Medicine Attitudes Questionnaire (IMAQ) was administered to medical students participating in the AzCIM's bi-annual, month long IM elective at the beginning of the elective, at the end, 6 months after completion and 1 year after the elective.

Mean scores and 95% confidence intervals were calculated for each data collection time. One-way analysis of variance (ANOVA) was calculated to assess IMAQ score differences between the 4 time points.

Integrative Medicine Attitudes Questionnaire (IMAQ)

- 28-question survey
- Scoring on 7-point Likert scale
- Concealed and developed as instrument to examine health care provider and medical student attitudes toward IM
- Validated in heterogeneous sample of health professionals (3)
- Final score equals total of individual scores after reverse coding certain questions
- Higher scores indicate more positive attitudes

Results

- 65 complete IMAQ scores were collected at baseline, 59 at the end of the elective, 36 six months post-elective completion, and 23 one year after.
- Post-elective scores were significantly higher than at baseline.
- No difference from baseline was found in scores 6 months and 12 months post-elective.

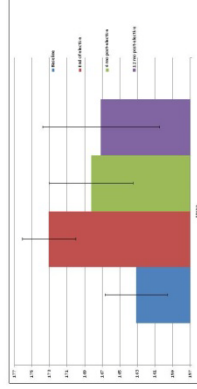


Figure 1. Means of Total IMAQ Scores by Time.
Error Bars Represent 95% Confidence Interval.

Time	N	Mean Score	Variance
Baseline	65	163.2	217.9
Post-elective	59	173.1	143.5
6 mo. post	36	168.3	212.9
12 mo. post	23	167.2	265.0
F	5.17 (p < .05)		

Table 1. Single Factor ANOVA of Total IMAQ Scores by Time from Elective

Conclusions

These preliminary results are encouraging regarding the elective's improving attitudes toward IM immediately after its completion.

This study serves as a resource and support for IM education assessment and evaluation.

Study Limitations

- IMAQ has not been tested for correlation to behavioral changes, thus the clinical relevance of IM's impact on practice are unknown.
- Significant loss to follow up. Half of the data collection relied upon participants receiving, completing, and mailing back questionnaires. These factors may have resulted in sample sizes too small to show any real effect for 6 month and 12 month post-elective data.
- Study population is not a random sampling of medical students. Students self-select and apply to take this course. Thus, their impressions of IM may be more positive than the general medical student population due to their interest in the field. Conversely, they could have a smaller margin for improvement in their attitudes.
- No control group to evaluate the above theories.



Future Directions

- The study is currently collecting data, and the addition of more 6 and 12 month post-elective data should add to its statistical power to more definitively demonstrate the elective's impacts on IM attitudes.
- Compare medical student to resident data to ascertain differences between the elective's effects on medical professionals at different stages in training.
- Evaluate potential effects of residency by comparing results of students who complete the elective in the spring to those who take it in the fall.
- Assess elective's impact balance and wellness through the Four Worlds Self-Care Assessment data, another aspect of the study.
- Conduct one-on-one interviews or focus groups with participants.
- Observe student behaviors with simulated patients to inform effects of IM education on actual practice behaviors.

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