EDUCATIONAL RESEARCH IN ACTION

Curriculum Reform in a Public Health Course at a Chiropractic College
Are We Making Progress Toward Improving Clinical Relevance?

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Improving education in health promotion and prevention has been identified as a priority for all accredited professional health care training programs, an issue recently addressed by a collaboration of stakeholders in chiropractic education who developed a model course outline for public health education. Using a course evaluation questionnaire, the authors surveyed students in the public health course at the Canadian Memorial Chiropractic College (CMCC) before and after the implementation of new course content based on the model course outline. Following the new course, there were significant improvements in perceived relevance to chiropractic practice and motivation to learn the material as a foundation for clinical practice. Changes made to the content and delivery of the course based on the model course outline were well received in the short term. (The Journal of Chiropractic Education 21(1): 20–27, 2007)

Key Indexing Terms: chiropractic; education; public health

INTRODUCTION

There is a growing awareness of the changing needs of society and health care caused by aging populations, sustained global-migration patterns, changing patterns of disease, and risk-factor distribution caused by factors such as lifestyle, behaviors, and social and economic differences.[1] The generation of students currently being taught in health professional schools will be practicing into the middle of this century and will be expected to not only provide high-quality professional care, but also successfully apply the principles of health promotion and disease prevention.[2] Concerns exist regarding deficiencies in the education of health professionals to meet the demands of the expanding role of the health services provider. In an effort to address this situation, medical schools and other health professional schools have turned their attention to students' preparation and competency in the areas of disease prevention and health promotion.[3–5]

In July 2000 the Surgeon General of the United States, Dr. David Satcher, declared a priority to improve the education of health professionals by, "... building health professional educational programs that are grounded in the principles of prevention."[2] He further suggested that, "... no medical professional should graduate from an accredited institution without a basic understanding of the principles of prevention." It has also been strongly argued that, "The health of populations will not improve without the participation of all groups with an interest in and an influence on health care."[6] Further, *Healthy People 2010*,[7] a national agenda for the future of public health published early in 2000 by the United States Department of Health and Human Services, supports the importance of improving the education of our future health professionals in the areas of health promotion and disease prevention by identifying the following objective:

> Increase the proportion of schools of medicine, schools of nursing, and other health professional training schools whose basic curriculum

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> for health care providers includes the core competencies in health promotion and disease prevention.[7]

In chiropractic education, attempts have also been made to improve the education of future chiropractors in health promotion and disease prevention in order to better prepare them for their expanded role in society and in health care. A preliminary study of public health in chiropractic colleges, published in 1995, indicated that there were significant inconsistencies in what was being taught in public health courses in chiropractic colleges across the United States.[8] The authors of that paper encouraged dialogue among public health faculties of chiropractic colleges to examine, modify, expand, and standardize public health curricula to better prepare chiropractic students to meet the challenges of their profession in a highly competitive health care industry. This report catalyzed an examination of public health education in chiropractic colleges by the Model Syllabus Task Force of the Chiropractic Health Care Section of the American Public Health Association. A template syllabus for a course in public health was designed.[9] The syllabus was further developed by a multidisciplinary team representing eight chiropractic colleges, private practitioners, the Model Syllabus Task Force, the School of Public Health at Yale, the Association of Chiropractic Colleges, and the National Board of Chiropractic Examiners. Overall course goals were designed and subject-specific teams then developed measurable learning objectives in epidemiology and biostatistics, health services administration, environmental health sciences, and behavioral health sciences to support these goals. Course goals, subject-specific learning objectives in each area, and sources of public health information were compiled into a course workbook and disseminated to all US chiropractic colleges and other interested parties (http://depts.washington.edu/ccph/pdf_files/MCWBFinalDrft02-19-02.pdf).[9,10]

At the Canadian Memorial Chiropractic College (CMCC), a course in public health has been part of the curriculum for many years and is viewed as an integral part of the educational experience of future graduates. CMCC is situated in Toronto, Canada and offers a 4-year professional program. The majority of students entering the program have at least a bachelor's degree with 2%–3% per year also having graduate degrees. The institution has just completed the 6th year of implementation of a new integrative curriculum. The previous curriculum consisted of 3 years of basic and clinical studies with the 4th year being a mix of didactic and practical teaching as well as an internship, all based very much on a traditional medical education model. In September 1999, a new integrative curriculum was introduced with the aim of placing the student's focus on chiropractic studies through attempts to make course material clinically meaningful from the first day of class.

Through this change to a more integrated, outcome-based program, the course in public health had remained relatively unchanged apart from being moved from the 4th year to the 1st year of the program. Its content was loosely defined by the accrediting body (Council on Chiropractic Education) and the specific curriculum was determined by the instructor. It should be noted that CMCC currently has no chiropractors on faculty with a graduate degree in public health and for many years the instructors were external faculty who were public health educators from local universities. Although they were highly qualified academics, none were health care practitioners. Historically, the public health course at CMCC suffered from poor attendance and a low level of student interest and attention. Through feedback received from student focus group meetings, it became clear that the 1st-year students were dissatisfied with the course and had difficulty identifying with the material and its application to chiropractic practice. Steps therefore had to be taken to identify possible problems with the course in order to provide a basis for remedial action. In this article we examine the public health course at CMCC and review the perceived effectiveness of recent reform.

METHODS

Evaluation was done by means of a questionnaire developed by using some questions from the short-form course experience questionnaire[11] and adding some mission-specific questions for CMCC diagnostic course evaluation. The questionnaire consisted of 25 questions with each item scored on a 5-point scale with 5 = strongly agree, 4 = agree, 3 = unsure, 2 = disagree, and 1 = strongly disagree. The questionnaire (See Appendix) is available electronically on the Web site of *The Journal of Chiropractic Education* (www.journalchiroed.com).

Students marked their responses to the items on a computer card that was then scanned in order to obtain responses per item. In order to get an

overview of the percentage of students who indicated specific problems with each item of the questionnaire, the percentage of all students who had strongly agreed and agreed (yes), those who were uncertain (neutral), as well as those who strongly disagreed and disagreed (no) were calculated. Because the questionnaire was administered toward the end of a lecture at which class attendance was low (convenience sampling), the response rate was only 76 (48%), but was large enough to control for sampling errors.[12] The results of this survey reflected our students' disinterest and dissatisfaction with the course material as well as the general impression that it was not relevant to chiropractic practice.

The negative feeling of our students toward the health promotion course required urgent attention. Changes to the curriculum were implemented based on a model course outline for the public health course at a chiropractic college.[9,10] The short-form course experience questionnaire was applied following the implementation of the new curriculum and the results were compared to those of the previous year. SPSS 14 for Windows (SPSS Inc, Chicago, IL) was used for all statistical analyses. The difference between the responses of the two cohorts was analyzed for all items with the independent sample *t* test, as well as the chi-square test for a number of the items where the student responses were deemed to be the most valuable (items 3, 4, 17, 19, and 25).

RESULTS

The new curriculum was implemented in 2004 and the initial results were positive. Short-form course experience questionnaires from 2003 were compared to those administered after the curriculum reform (Tables 1 and 2). The results of the *t* test showed significant differences between the responses of the two groups for all items except for items 5, 16, and 23. The chi-square test (Table 1) showed significant differences among the five items that were deemed to be the most valuable in determining whether the students' perceptions of the value of the changes changed after the curriculum reform. The results shown in Table 2, where the percentages of students from each cohort who had strongly agreed and agreed (yes), those who were uncertain (neutral), and those who strongly disagreed and disagreed (no) were compared, showed improvements in perceived relevance to chiropractic practice and motivation to learn the material as a foundation for clinical practice. The responses also suggest that we are moving away from the perception that the course was overly theoretical and abstract. Previously, up to 90% of the respondents were not satisfied with the quality of the course. Following the changes based on the model course outline for public health education at a chiropractic college,[9,10] we noted a redistribution of opinion—notably 40% of respondents were satisfied with the quality of the course, 30% were neutral, and 30% were not satisfied. Previously, attendance in lectures for public health was dismal with as little as 5%–10% of students attending on a regular basis. Since the implementation of the new curriculum, we have noted a significant increase in attendance with 50%–75% of students in regular attendance.

DISCUSSION

In the past there has been very little emphasis in chiropractic education on public health or health

Table 1. Results of a Chi-Square Test Comparing the Student Responses of the Two Cohorts to Five of the Items on the Questionnaire

Item	2003	2004	Total
3. I can relate what I learn in this course to professional chiropractic practice.	12	55	67
4. I feel motivated about learning the material presented in this course as a foundation for clinical practice.	3	28	31
17. The course is overly theoretical and abstract.	43	6	49
19. Some of this course material has already been presented in another course.	10	32	42
25. Overall, I am satisfied with the quality of this course.	3	28	31
Total	71	149	220

Pearson chi-square = 91.1905; df = 4; $p = .000$.

Table 2. Results of Course Evaluation Questionnaires Administered Before and After Curriculum Changes to the Public Health Course

Evaluation item	2003 $N = 76$ (48%)			2004 $N = 69$ (41%)		
	No (%)	Neutral (%)	Yes (%)	No (%)	Neutral (%)	Yes (%)
1. It is always easy to know the standard of work expected in this course.	79	17	4	33	23	42
2. The course developed my problem-solving skills.	87	9	4	54	36	10
3. I can relate what I learn in this course to professional chiropractic practice.	53	32	16	9	12	80
4. I feel motivated about learning the material presented in this course as a foundation for clinical practice.	84	9	4	27	32	40
5. The work load was too heavy.	58	24	18	55	32	13
6. The course sharpened my analytic skills.	90	7	4	54	33	13
7. Opportunities are available for me to elaborate on (eg, discuss) material presented in this course.	56	26	17	38	20	42
8. Resource material (texts, videos, etc) helped me to understand the material presented in this course.	69	21	10	30	36	32
9. To do well in this course all you really need is a good memory.	13	4	80	26	13	60
10. I receive adequate feedback that helps me to improve the work I do in this course.	80	11	9	53	38	9
11. As a result of this course, I feel confident about tackling unfamiliar problems.	77	21	1	46	36	17
12. My assessments in this course challenge me to analyze as well as recall information.	63	17	20	32	30	37
13. The lecturer seems more interested in testing what I memorized than what I understood.	11	17	73	30	22	47
14. It is often hard to discover what's expected of me in this course.	8	5	87	30	28	42
15. I was generally given enough time to understand the things we have to learn.	45	21	33	13	17	69
16. The lecturer makes a real effort to understand difficulties students may be having with their work.	50	25	24	23	51	25
17. The course is overly theoretical and abstract.	21	21	57	69	22	8
18. The lecturer is extremely good at explaining things to us.	68	18	13	16	41	41
19. Some of this course material has already been presented in another course.	70	17	13	35	17	46
20. The lecturer works hard to make the course interesting.	74	12	15	17	29	52
21. The lecturer put a lot of time into commenting on students' work.	72	18	8	56	29	13
22. The course helped me to develop the ability to plan my own work.	79	16	5	50	36	14
23. The sheer volume of work in this course means I can't comprehend it all thoroughly.	38	14	47	48	19	34
24. The lecturer made it clear right from the start what is expected of the students.	67	20	13	29	23	46
25. Overall, I am satisfied with the quality of this course.	91	4	4	29	29	40

promotion, despite chiropractors' claims that chiropractic is among the leading providers of health promotion and wellness.[13] Since Krishnan et al[8] published a report on public health education in chiropractic colleges, there has been an effort to standardize public health curricula throughout North American chiropractic colleges.[14] There are relatively few chiropractic educators who are adequately qualified to teach public health in chiropractic colleges; however, this trend is beginning to change. Research in the area of chiropractic and health promotion has also suffered from a lack of resources and interest in this field.[13] Hawk et al[14] demonstrated that most chiropractors routinely counsel patients in a limited number of the multitude of well-documented preventive and health-promoting behaviors recommended by the US Preventive Services Task Force and *Healthy People 2010*, including physical activity, stress, dietary habits, obesity, medication use, and occupational hazards. They also report that very few chiropractors routinely counsel their patients for the health indicators of substance abuse, responsible sexual behavior, mental health, and injury and violence prevention. Also of note is that chiropractors do not routinely perform or refer for the screening and prophylaxis procedures recommended by the US Preventive Services Task Force.[14] Shearer et al[15] discussed chiropractors' perceptions about intimate partner violence based on the results of a survey they distributed at a chiropractic continuing education conference. They found that although general knowledge of intimate partner violence was good, knowledge of clinical indicators and victim management was fair to poor. Interestingly, despite admitted discomfort among the respondents regarding inquiring about intimate partner violence, there was very little interest in receiving additional training in this area.[15]

In 2000, Hawk[13] compared current chiropractic education in public health with chiropractic clinical practice of health promotion and noted some significant discrepancies:

- Chiropractic education, in general, has focused on the disease model with its emphasis on a single cause of disease. Prominent in this model are the biological sciences, such as microbiology and pathology, rather than the biopsychosocial model which emphasizes multiple causes of illness and dysfunction.
- Prevention and wellness care require a high level of patient involvement and commitment to self-care, and practitioners without the skills to engage patients in active self-care will not be successful wellness practitioners.
- Teaching methods to help patients learn how to take charge of their own health is a growing area of knowledge that has not yet been included in chiropractic college curricula.
- Chiropractic education in public health rarely emphasizes the importance of interdisciplinary collaboration. Wellness or health promotion is so broad that it is not feasible for a single practitioner to address all aspects of care adequately.
- Chiropractic education has, in the main, not prepared chiropractors to form alliances with public health departments, which are the repository of each community's store of prevention and health promotion information and the source of a wealth of public health programs.[13]

The inconsistencies noted between public health education at North American chiropractic colleges stimulated development of a model course for public health education in chiropractic colleges.[9] The model course outline was the framework from which we developed our new course in public health at CMCC. That is not to say that we completely eliminated the content from the previous course; in fact there was a significant amount of material that was included in our previous course in public health (ie, communicable diseases, epidemiology). However, based on our experience and student feedback, it was necessary to review not only the course content, but also its delivery, to address some of the identified issues with respect to clinical relevance and application. We wanted to present the material from the chiropractic perspective whenever possible and utilize resources from the community when the nature of the course material exceeded the knowledge and experience range of our internal faculty.

The model course outline was helpful in this process; however, we found it to be too cumbersome to be completely applied to a short (39-hour) course in public health. We reviewed the subject-specific learning objectives and fit the outline to reflect our restrictions in both time and available resources. We focused the learning objectives to represent the seven major subject areas described in the model course outline: environmental sciences, epidemiology, health policy and management, infectious diseases and immunology, noncommunicable diseases, health promotion and clinical preventive services, and occupational health. The new course

content was delivered by a wide collaboration of stakeholders in public health, including field practitioners, faculty clinicians, external faculty, and representatives from local public health departments.

The results from our survey suggest that the changes in the content and delivery of our course in public health based on the model course outline have been successful in the short term. We interpret our results with caution as we acknowledge that the success or failure of a course should not be solely determined based on the results of student satisfaction questionnaires. However, long-term outcome measures may be difficult to ascertain. Often in chiropractic colleges, student performance on licensing examinations is used to assess competence in respective academic disciplines. This may prove to be difficult with public health and health promotion based on the poor representation of and difficulty in assessing competency in public health or health promotion in a written exam format. Perhaps in the future, more surveys of field practitioners similar to that performed by Hawk et al[14] will serve as a valuable tool to determine whether we are improving in the deficient areas described above. For example, a survey may be developed to help determine whether chiropractors are working in collaboration with local public health departments or regularly referring for screening procedures.

Developing a course that could address relevance and integration was a challenge. Other authors have described some of the challenges associated with integrating health promotion material within biological sciences' dominant medical curricula and developing its clinical relevance for future application.[1,16] This theme is not isolated to medical training programs as similar challenges are faced by chiropractic educators, despite chiropractic's self-perception as a "wellness" profession.[17]

An example is provided by Hawk et al[18] who described an attempt to implement a course on wellness concepts into a chiropractic college curriculum in order to address some of the discrepancies listed above. The course was successful in improving students' familiarity with wellness concepts and resources for future clinical application; however, there were limitations resulting from a lack of clear methods of practical application of the material they had learned.[18] Globe et al[19] describe their attempt to improve preventive health services training in chiropractic colleges. They reviewed patient files to determine if chiropractic interns were providing clinical preventive health recommendations at a greater frequency after implementation of the model course outline with greater emphasis given to health promotion and disease prevention. They found no significant increase in documented health promotion or clinical preventive services. The lack of improvement may indicate that enhancing this aspect of the clinical encounter may require additional training to reinforce these concepts in a clinically relevant learning environment beyond that provided in the typical public health or health promotion course embedded in chiropractic college curriculum.[19]

Currently the public health course at CMCC is delivered in the midst of a course load heavy on the biological sciences. We are telling our students that this material is important, but we de-emphasize it in relation to the biological sciences in that it has far fewer hours and it is segregated from learning about disease. We are sending the message that prevention and health promotion are separate from clinical chiropractic practice. This theme echoes similar sentiments put forward by Green, who suggested that public health education segregated from clinical experience and limited in clinical relevance does not adequately prepare graduates to practice health promotion and clinical preventive services.[20] Integrating prevention and health promotion into the existing biological sciences has been successfully accomplished in other health professional training programs.[1,5,16] Taylor and Moore[16] describe the long-term integration of health promotion and disease prevention into several major courses in the student curriculum at Harvard Medical School. Teaching about prevention, both conceptually and practically, when the students are learning about disease will help them understand the importance of both. According to adult learning theory, material taught this way is most likely to be retained in a manner that permits later appropriate application.[16] Integrating prevention and health promotion throughout the curriculum may encourage the students to appreciate the value of prevention in virtually every clinical encounter.[16] Perhaps in the future, eliminating an individual course in public health may facilitate the integration of this material into biological science courses without adding more curricular time.

CONCLUSION

We reviewed and implemented the model course outline for public health education at a chiropractic

college, which has led to perceived improvements in the clinical application and relevance of the material. In the future we hope to successfully improve the integration of public health, including prevention and health promotion, with the biological and clinical sciences in an effort to advance the contribution of chiropractors to public health and to encourage our graduates to participate in the drive to improve the health of our population.

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APPENDIX
Canadian Memorial Chiropractic College

Course Experience Questionnaire

Please write at the top of your response card: Male or Female
Using the scale below, please indicate how you perceive this course.

A	B	C	D	E
Strongly Agree	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**

1. It is always easy to know the standard of work expected in this course.
2. The course developed my problem-solving skills.
3. I can relate what I learn in this course to professional chiropractic practice.
4. I feel motivated about learning the material presented in this course as a foundation for clinical practice.
5. The work load was too heavy.
6. The course sharpened my analytic skills.
7. Opportunities are available for me to elaborate on (eg, discuss) material presented in this course.
8. The lecturer put a lot of time into commenting on students' work.
9. To do well in this course all you really need is a good memory.
10. I receive adequate feedback that helps me to improve the work I do in this course.
11. As a result of this course, I feel confident about tackling unfamiliar problems.
12. My assessments in this course challenge me to analyze as well as recall information.
13. The lecturer seems more interested in testing what you've memorized than what you've understood.
14. It is often hard to discover what's expected of you in this course.
15. I was generally given enough time to understand the things we have to learn.
16. The lecturer makes a real effort to understand difficulties students may be having with their work.
17. The course is overly theoretical and abstract.
18. The lecturer is extremely good at explaining things to us.
19. The lecturer asks us questions just about facts.
20. The lecturer works hard to make the course interesting.
21. There was a lot of pressure on me to do well in this course.
22. The course helped me to develop the ability to plan my own work.
23. The sheer volume of work in this course means I can't comprehend it all thoroughly.
24. The lecturer made it clear right from the start what is expected of the students.
25. Overall, I am satisfied with the quality of this course.

Comments: