ABSTRACTS OF ACC CONFERENCE PROCEEDINGS

Platform Presentations

Life University's Involvement and Participation in the World Health Organization's Tobacco Free Initiative and Framework Convention on Tobacco Control

Medhat Alattar, M.D., M.S., D.C., **Sid E. Williams**, B.S., D.C., **Gary Auerbach**, B.A., D.C., and **Ronald Kirk**, B.S.(Ed.), M.A., D.C., Life University

Life University's commitment to health and wellness education has led to intimate involvement in the World Health Organization's Tobacco Free Initiative and the Framework Convention on Tobacco Control. Tobacco utilization constitutes a 21st century global public health disaster. Tobacco use has been linked to death from cancers, cardiovascular diseases, respiratory diseases, and pediatric diseases. The increase of cigarette consumption in developing countries debilitates the health of their productive populations and creates a sinkhole for their economies.

METHODS

Life University has played a significant role in participating in the Tobacco Free Initiative's planning sessions that began work on the historic Framework Convention on Tobacco Control (FCTC). In May 1999, Life University cosponsored the NGO Forum for Health Special Session on Tobacco Control in Geneva, Switzerland. Life hosted the PAHO/WHO/NGO meeting in support of the FCTC held April 2000 on Life University's campus with the participation of INFACT, the WFC, the ICA, and representatives from a myriad of Pan American health organizations. Life University has developed and promoted the conceptual themes of the Tobacco Free Initiative in three strategic integrated approaches including chiropractic student education, practitioner and patient education, and global networking through its various international activities.

RESULTS

Life University has committed its resources to promote healthy lifestyles complementary to chiropractic care. This commitment has led to active involvement in the WHO Tobacco Free Initiative and participation in several historic strategic meetings in support of the Framework Convention on Tobacco Control. Life students are thoroughly familiarized with the insidious destructive potential of tobacco addiction. Many have quit smoking. Chiropractors and their patients worldwide are being made more aware of the deleterious effects of tobacco.

CONCLUSION

The use of tobacco is proven to be destructive to the human body. It is a priority for the chiropractic profession to advocate against its use to maintain health and well-being.

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Student Autonomy in Learning
Chiropractic Students' Perceptions of Locus of Control in Their Academic Successes and Failures

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There is an increasing acceptance of the need for continuing professional development (CPD) in all areas of professional life, including the health care professions and chiropractic. The rationale behind CPD is that the knowledge and skills attained at the end of undergraduate education and training are insufficient to maintain competencies throughout professional life in a world that is rapidly evolving and changing. As a result, not only must chiropractic students graduate with the necessary knowledge, understanding, and skills to undertake safe and competent practice, but also with the attitudes necessary to undertake lifelong learning and professional development. As part of this, students must be able to recognize and identify their own learning needs, the resources required to achieve these, and an ability to reflect, evaluate, and apply learning outcomes in practice. Students must become autonomous learners, taking responsibility for what and how they learn.

PURPOSE

From the evidence presented to date, it can be hypothesized that students who take responsibility for their learning, and for their own academic successes and failures, are more effective learners as well as more ready to adopt the attitudes essential to lifelong learning and professional development. The aim of this study was to survey, using a self-administered questionnaire, undergraduate chiropractic students' perceptions of control over their learning in terms of their academic successes and failures.

METHODS

The questionnaire investigated two domains of control over academic outcomes, namely academic successes and academic failures. In this study, the attributions or causality dimension (i.e., the perceptions students have as to the factors which cause or influence academic outcomes) was divided into the attribute scales of self-ability, self-effort, powerful others (tutors), and chance/fate/luck. The cognitions dimension was divided into a "self" scale (how much students believe that they themselves are responsible for their own academic successes and failures) and an "unknown" scale (how much students don't know about why they succeed or fail). For each of these six scales, item statements were prepared for both academic successes and academic failures.

RESULTS

Two hundred seventy-five students out of a total of 410 on the undergraduate chiropractic course completed the questionnaire (67%). The response rates from years 1, 2, 3, 4, and 5 were 45%, 82%, 61%, 84%, and 62%, respectively. Scores for each of the six scales were calculated using year of study, sex, and age as independent variables.

Students were fully aware of the factors that determined their success or otherwise, and were strongly internalized with regard to responsibility for their academic outcomes. Students perceived that their own efforts, or lack of, more than their own ability, or lack of, were primarily responsible for their academic successes and failures. However, the role of external factors, in terms of the role of the tutor, was also perceived as contributing to academic successes. Students were generally unwilling to ascribe responsibility to the tutor in the same way for academic failure, and perceived this to be as a result of lack of their own efforts. Perceptions of academic locus of control were not significantly different at different stages of the course nor were there any substantial differences in these perceptions between male and female students and between differing age groups.

CONCLUSION

This study surveyed the perceptions of chiropractic students at the Anglo-European College of Chiropractic (AECC) regarding their academic locus of control. The results suggest that undergraduate students at the AECC are highly motivated and willing to take responsibility for their own academic achievements. This is encouraging in view of the moves toward continuing professional development and the need for autonomous learning in professional chiropractic practice.

Undergraduate Students' Attitudes Towards and Perceptions of Research and Research-Related Activities

Jennifer E. Bolton, B.Sc., Ph.D., Anglo-European College of Chiropractic

All of the health care professions, including chiropractic, are currently under pressure to undertake evidence-based practice (EBP). The rationale behind EBP is that clinical decision-making should be based, at least in part, on sound research evidence so that patients receive effective treatment to the highest possible standards. This current movement means that both the skills to undertake EBP and the attitudes to adopt evidence-based approaches to practice are now an essential part of the undergraduate curriculum in educating and training chiropractors. Moreover, research is now considered vital to the future progress and development of the profession, and there is an urgent need to educate and train future chiropractors with the skills and attitudes necessary to participate in research activity.

The Anglo-European College of Chiropractic (AECC) has been, and continues to be, one of the few chiropractic colleges worldwide that includes a mandatory research project within the undergraduate curriculum. Before embarking on project work at the AECC, students complete a course in Research Methodology, which not only gives students the skills to successfully do a project, but which also increases students' awareness of research in practice. To reflect the current moves to EBP, the course has recently been renamed Research in Clinical Practice, with greater emphasis on literature search strategies, systematic review and critical appraisal skills, implementation of research findings in practice, and the use of clinical guidelines.

PURPOSE

In the light of current moves to make the research methodology course at the AECC more clinically meaningful and relevant, the present study will be carried out to survey students' attitudes to, and perceptions of, research and research-related activities. Data will be collected immediately prior to (September 2000), and at a midpoint (February 2001) of the Research in Clinical Practice course. A self-administered questionnaire will be used.

METHODS

The survey questionnaire is divided into two parts. In the first part, perceptions of research are measured on three continua (easy/difficult, necessary/unnecessary, interesting/boring). The second part of the survey assesses attitudes towards the role of research in undergraduate course and future career (6 items), research (4 items), inability to do research (3 items), role of research in the profession (3 items), and faculty involvement in research (3 items). These 19 items are measured on 7-point attitudinal Likert scales using the anchor statements "strongly agree" and "strongly disagree".

Questionnaires will be completed anonymously but students will be asked to give their examination number so that pre- and postquestionnaires can be matched for paired statistical analysis.

RESULTS

These will be presented at the ACC Educational Conference (San Diego, March 15–17, 2001).

CONCLUSION

The data to be presented will give some insight into the attitudes to, and perceptions of, research and research-related activities of undergraduate chiropractic students before and after receiving a course on Research in Clinical Practice. The data will provide an important quality assurance mechanism for the course and will be helpful in revising and improving the course for future cohorts of students. Presentation of these data may also stimulate similar studies in other chiropractic colleges. By using the same questionnaire, useful comparisons will be possible in the future between undergraduate opinions on research in colleges with and without structured research courses in the curriculum. Such data will be invaluable in evaluating the role of research in undergraduate chiropractic curricula at a time when there is an urgent need to enhance the number of chiropractors who are prepared to undertake evidence-based practice and/or some research activity as an integral part of their professional lives.

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History and Evaluation of a Chiropractic College's Employee Wellness Program

Karen Boulanger-Mihan, B.A., and **Patrick Goff**, Ed.D., Palmer Center for Chiropractic Research

At a recent research conference, support was voiced for chiropractic to begin collaborative efforts with other disciplines and to address the issue of wellness/maintenance care and chiropractic. One place to begin is to examine the health promotion literature and review the wellness culture as established by the employees at the chiropractic colleges. WELCOA (Wellness Councils of America) differentiate two types of work site wellness programs: activity-centered, which offer a series of health promotion activities but do not collect measurements; and results-oriented, which are "carefully researched, thoughtfully designed, and flawlessly executed." The purpose of this paper is to report on the review and evaluation of the history of a chiropractic college's employee wellness program and make recommendations contributing to a revised and results-oriented program. The college's program began in 1994 but has never been evaluated using the strategies available in the health promotion literature.

METHODS

In order to review the history of the wellness program, records were procured from the committee co-chairs and reviewed to create a summary of the development of the program. In order to assess the program for WELCOA's successful factors of a work site wellness program, their checklist was administered and completed by the committee co-chairs and the college president. The checklist included specific yes/no questions under most factors (totaling 52 items), as well as checklists under a few factors to identity the presence/absence of benefits, programs, and types of data collection. Responses between the three people were qualitatively compared for agreement. To aid in the evaluation process, structured oral interviews were conducted with four committee members.

RESULTS

In 1994, a committee comprised of a varied assembly of volunteers met weekly, reviewed and prioritized the wellness visions, and pioneered the milestone program called "Trek." Among the two committee co-chairs and college president, there was general disagreement regarding the presence or absence of factors listed on the WELCOA checklist. Of the 52 yes/no items, all three agreed on only 15 items.

Senior level support: Visual administrative support and communication between the committee and administration was inconsistent. *Collective team*: Consensus occurred with one item, simply that the committee met regularly throughout the year. *Data collection*: Most types of data were not collected. The only exception was the on-line health risk appraisal that was implemented into the latest Trek program. *Operating plan*: A modest level of agreement acknowledged the paucity of measurable goals that were linked to and supported by data. *Program offerings and formats*: Knowledge varied among respondents except that most agreed that health information and personal counseling were available on several of the topics. *Supportive environments*: All three respondents agreed on two items: healthy food options were available in the cafeteria and the facility was monitored for overall safety. *Evaluation*: The highest level of agreement (6/8 items) was reached. Lack of program evaluation was a significant absence since it is an essential and distinctive element of results-oriented programs.

DISCUSSION

The variability in the information is consistent with the fact that the committee failed to accurately document, report, and measure their activities and effectiveness as well as obtain consistent senior level support. The disagreements in the checklist could be due to differences of opinion or lack of factual information. In order to expand the program to include results-oriented characteristics, recommendations for each component were presented.

CONCLUSION

The wellness committee was successful in completing goals leading to wellness activities, but not program evaluation and senior level support. After following the recommendations, the committee may augment a wellness culture that not only contains costs, but also raises the wellness consciousness of the campus.

The Professional Development Plan
A Tool for Meeting Faculty Aspirations and Enhancing Institutional Mission

Glenn F. Fried, B.S., M.Div., and **Christopher J. Good**, D.C., M.A. (Ed.), New York Chiropractic College

Scarcity of resources, declining enrollments, and calls for accountability have required higher education to become directed in their efforts whereby faculty and administrators are exhorted to deliver cost-effective curriculums. Emphasis on accountability and focus need not preclude creativity in an environment where priorities are identified and discussed in a supportive, collegial manner. Survey evidence from 865 academic officers finds 69% clarifying institutional mission, 86% redefining faculty roles, 66% balancing institutional mission and faculty rewards, and 78% improving the balance of time and effort on faculty tasks.

Our concerns focus on how faculty and institutions work together in setting expectations. Diversity of faculty work must be clearly defined, then followed by faculty and administration developing plans for professional development to include goals contributing to individual, departmental, and institutional enhancement, ultimately becoming effective tools in faculty development and performance evaluation.

Intentional planning benefits the academic community as it is called upon to do more with less. Institutional mission becomes more important in delineating what can be accomplished. Establishing priorities for novice and seasoned faculty and the institution, who when working together increase the probability of attaining their goals and objectives.

METHODS

The Faculty Evaluation Committee (FEC) developed guidelines for design and utilization of professional development plans (PDPs), which were finalized in 1999 with faculty supporting implementation. The stated purpose of developing a PDP is to provide direction to intellectual and professional growth of the individual; ensure that individual goals are congruent with the mission, goals, and objectives of the College; and provide written records of goals and specific means of achieving them.

The PDP format includes:

- *Statement of Goals*—Including aspirational statements, long- and short-range goals.
- *Means of Attaining Goals*—General strategies explained and specifics listed so that attainment of stated goals can be demonstrated.
- *Time Frame*—One to five years to incorporate short- and long-range goals. Review of PDPs occurs periodically throughout the year, with evaluation of goal attainment conducted annually.

RESULTS

All full-time faculty and many part-time faculty submitted initial PDPs to department heads/directors in winter 1999. Developing the initial PDP was instrumental in identifying merging priorities of individual faculty, ongoing and emerging fiscal needs, training needs of faculty and administration in writing performance goals and establishing performance criteria need for elaboration regarding classifications and examples of faculty work, and tools to evaluate quality of work.

By July 31, 2000, the first evaluation cycle utilizing PDPs was completed. Self-reports by faculty were submitted representing their assessment of progress towards attaining stated goals and objectives. Reports were formally reviewed to determine whether goals were met, and if not, analysis was conducted to determine why. This dialogue proved helpful as faculty revised their PDPs and facilitated budgeting for the 2001–2002 fiscal year.

DISCUSSION AND CONCLUSION

PDPs afford faculty and institutions opportunities to reflect on activities and outcomes and provide mechanisms for other planning (budgeting, strategic planning) to occur. PDPs are sensitive and responsive to cycles of faculty development, facilitating faculty preparation for promotion review and rank advancement. Individual faculty design, development, implementation, and revision of PDPs proved an effective vehicle for significant interaction between faculty aspirations and institutional expectations. Collaborative and collegial interaction is fostered between faculty and administration, and provides the environment for formative and summative assessment. Formative evaluation assists faculty and the institution in activities that facilitate continued professional development, which contribute to the institution attainment of its mission. Summative evaluation becomes a more responsible, mature, and accountable activity in the life of faculty and the institution. Ultimately, the PDP becomes a vehicle whereby the individual and the College become partners in advancing personal growth and institutional mission.

Developing a Community-Based Educational Program for Older Patients

Brian Gleberzon, D.C., Canadian Memorial Chiropractic College

Chiropractic pedagogy is recognizing the importance of community-based education. This article describes the manner in which a series of community-based presentations were developed, specifically targeting the elderly. The presentations primarily addressed the three areas of greatest concern to older patients: osteoporosis, osteoarthritis, and injury prevention. The primary objectives of the presentations were to dispel any myths that older patients may have had about osteoporosis and osteoarthritis, and to suggest ways to safety-proof their homes. Additional topics discussed were exercise, nutrition, and the role of chiropractic in geriatric health care.

METHODS

An application from the Canadian Memorial Chiropractic College for funding from the Ontario Ministry of Health to develop a series of presentations was accepted. The Ontario Chiropractic Association also sponsored the presentations. Seven fourth-year students participated in the project.

A focus group was convened in order to identify areas of particular concern to the target audience, and to establish the best method of disseminating information. A notice was placed on a senior's Internet website, indicating that any interested senior community groups could request a presentation. Twenty-five presentations were conducted at 12 different community centers. Presentations were conducted by chiropractic interns. Pre- and postpresentation surveys were given to each member of the audience, and the responses were analyzed.

RESULTS

Even though the number of returned questionnaires was low ($N = 16$), the survey results suggest that the primary objectives of the presentations were successfully met. When asked, 15 of 16 (94%) respondents stated that they attended the presentation for general interest. Nine of 16 (56%) respondents considered themselves *somewhat* informed about the topics to be discussed, with only three respondents stating they felt they were *well* informed.

After the presentation, 15 of 16 respondents reported that the presentation was either *very* informative ($N = 10$) or *somewhat* informative ($N = 5$). Importantly, 13 of 16 respondents (81%) indicated that the presentation was *very* understandable; the remaining respondents reporting the presentation was *somewhat* understandable. Thirteen of 16 respondents indicated that they would try to use *all* or *most* of the suggestions to safety-proof their homes, and 14 of 16 respondents indicated that they either *knew a lot about the topic because of the presentation* ($N = 9$) or *knew a lot before the presentation and learned a lot more during it* ($N = 5$).

DISCUSSION

The importance of chiropractic geriatric education is becoming more and more apparent. Demographic studies indicate that this group of individuals are the fastest growing segment of the population, and are expected to comprise a disproportionately larger percentage of a practitioner's portfolio.

Osteoporosis, osteoarthritis, and falls and fractures are leading causes of morbidity and mortality among older patients. The emerging focus in health care away from a disease-based approach toward a model that advocates prevention, health promotion, and wellness parallels the tenets traditionally embraced by chiropractic philosophy, and can be promoted by community-based education programs, such as the ones described here. Moreover, a community-based educational program may enable students to develop important clinic skills that they may not otherwise have had an opportunity to develop during their internships.

CONCLUSION

Community-based educational programs are important tools to promote health and wellness. As Goldzweig summed up "...good medicine means going beyond the walls of the operating room, the emergency room, and the examination room. It means going to the people before they end up in any of these "rooms" and helping them to change their lives in a way that will foster their health, their well-being and their happiness."

A New Model for Classifying and Evidencing Faculty Work in Chiropractic Education

Christopher J. Good, D.C., M.A.(Ed.), and **Glenn F. Fried**, B.S., M.Div., New York Chiropractic College

The main goal of chiropractic colleges is to produce high-quality practicing chiropractors. Teaching should therefore be emphasized as a top priority, among things like citizenship, scholarly activity, and other professional activities. This is in contrast to traditional faculty evaluations in higher education, which emphasize publication.

In 1999, after years of struggling with faculty evaluation issues, New York Chiropractic College set out to design a new model. This began with the formation of the ad hoc Faculty Evaluation Committee (FEC). The committee was intentionally designed to include the main players in process: faculty, department heads, and administrators.

The FEC established a set of guidelines to help faculty write a Professional Development Plan (PDP). The PDP is an annual document that establishes short-term and long-term goals and objectives. After a subgroup reviewed initial PDPs, developing a "menu" of faculty work opportunities became an immediate concern. Thereafter, the more difficult task of determining how to evaluate the work was addressed.

METHODS

Reference sources included other colleges' work on faculty evaluation and texts. Using the book *Assessing Faculty Work* by Braskamp and Ory, the subgroup began to mold its own document. This involved identifying main categories, then developing the specific items related to work activities and their evidencing. After significant discussion and revision, a final document was accepted as a working model.

RESULTS AND DISCUSSION

The final document contained four main categories and associated items: The Work of Teaching, The Work of Research and Scholarly Activity, The Work of Practice and Professional Service, and the Work of Citizenship. A preface was added to the entire work that discussed its purpose and dynamic nature.

The importance of each category and its subheadings will be discussed. A rationalization of some of the more controversial items under each subheading such as "Faculty Practice," "Participating in Civic, Political, Religious and Community Organizations," and "Holding Public Office" will be given.

A list of the types of evidence was produced and will be presented. This includes a discussion of the general subheadings "Descriptions," "Outcomes," "Judgments," "Eminence Measures," and "Self-reflection and Appraisal." A listing of the types of evidence germane to each subheading in a category is given. These are items that could be used to confirm that work was done and possibly aid in determining the quality of that work.

CONCLUSION

Developing a thorough classification is the basis for writing a professional development plan and is a useful tool in faculty evaluation and work decision-making. The list of evidences is important for portfolio development.

Developing the specific tools to assess the quality of faculty activities is an area for future work. The tools, however, must be user friendly and help aid decision-making concerning contract renewal, promotion, and awards. Development of the evidencing tools could prove to be the most difficult of all tasks in creating a quality faculty evaluation system.

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A Practice-Oriented Approach to Teaching Health Concepts Related to Chiropractic

Bart N. Green, M.S.(Ed), D.C., D.A.C.B.S.P., Palmer College of Chiropractic–West and Palmer Center for Chiropractic Research

Concern has been expressed in all health professions' literature regarding the decidedly nonclinical approach to teaching public health. As has been stated by the well-respected doctor Stephen Woolf, "Clinicians cannot ensure

the cleanliness of water and food supplies, cannot redesign motor vehicles to improve safety, and cannot control the behavior of their patients. Nonetheless, the potential capabilities of clinicians in promoting health are substantial." The inescapable impact of the clinician on the health behaviors of patients serves as the substrate for the purpose of this study, which is to present a practice-oriented course in health promotion for chiropractic interns.

METHODS

The curriculum begins with small group discussions utilized to investigate students' attitudes and perceptions of public health and the relation of this topic to chiropractic practice. Based upon readings from chiropractic journals, questions are asked that challenge students to personally assess how the topic of health promotion merges with their philosophical perspective on chiropractic. Students then survey the consumer environment to assess the public perception of the same topics. The Healthy People documents published by the U.S. Department of Health Services serve as a vehicle to examine public health issues from a chiropractic perspective. Each week learners participate in topic-focused sessions aimed at broadening their perspectives and their roles as health care providers. At each session, students are given current journal articles or text readings to supplement the group discussion and practice any new skills that are learned. Examples of topics include patient contracting, taking a well-patient history, nutrition, weight loss, breast cancer, and disease screening. The course culminates in students completing a health promotion clinical project of their choice. A course text is used as well as current chiropractic and health sciences literature. The curriculum runs for 9 months, students meet for 1–2 hours per week, and have approximately 1 hour of assignments per week.

RESULTS

When initially told about this program 3 weeks prior to its implementation, students were excited. However, once the students self-selected into the program and officially started, they demonstrated little interest in participating. The program was terminated early due to a lack of student participation and an abundance of apathetic attitudes. Inventories pertaining to student attitudes toward health promotion were collected at the beginning and end of the program and are being analyzed. Results of the end of program rating scale (5 = strongly agree, 1 = strongly disagree) are presented as means: satisfaction with program = 3.3, material is important in chiropractic practice = 4.05, my groups faculty cares = 4.7, my group faculty is accessible = 4.33.

CONCLUSION

This study presents a practice-oriented course in health promotion for chiropractors. Syllabi, lesson plans, course materials, course handouts, and assessment tools used in the curriculum will be presented. What has been learned from this trial is being shared with other chiropractic educators with the hopes of improving the public health education of chiropractic students.

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Letters to the Editor for Teaching Critical Thinking and Professional Communication

Bart N. Green, M.S.(Ed), D.C., D.A.C.B.S.P., Palmer College of Chiropractic–West and Palmer Center for Chiropractic Research

The purpose of this study is to describe an innovative teaching strategy, student-written letters to editors of peer-reviewed journals, which is intended to develop critical thinking and professional communication skills in chiropractic students.

BACKGROUND

Little evidence exists in the literature describing or evaluating the teaching of critical thinking in chiropractic colleges. Critical thinking is difficult to teach and typically requires small student-to-faculty ratios, several active learning formats, and large amounts of time. The assessment of critical thinking skills is difficult and controversy exists in the education literature of the health professions as to which evaluation methods may be valid. Properly written letters to the editor of a peer-reviewed journal may represent one method of teaching and assessing students' critical thinking and professional communication abilities.

METHODS

For 8 weeks, first-year students are taught elements of several basic research designs commonly published in the chiropractic literature and provided instruction and practice in critical appraisal. Methods for providing objective feedback in a courteous and professional manner are also discussed and role modeled. Following this preparation, students write simulated letters to the editors of peer-reviewed journals about recently published articles. The projects are graded using a standardized grading form and students receive feedback on their papers. Student responses pertaining to the usefulness of this project are collected using a 7-item survey instrument using a 5-point scale.

RESULTS

Five hundred eighty-seven students have completed the project yielding an average score for the entire sample of 23.9 out of 25 possible points (range 0–25, SD 2.34). Survey responses on the 5-point scale are very positive, with no item averaging less than 3.67. Several students have published their projects in journals.

DISCUSSION

The average score for this project is high and can be attributed to a number of things, including high performance, grade inflation, and grading criteria that do not discriminate between high and low performers. Students feel this assignment helps to develop critical appraisal and professional communication skills and that the course prepares them to be able to complete this assignment. A large percentage of students agreed that in completing this project they would be more likely to write a letter to the editor of a journal when they are in practice. Some students do not divide tasks among themselves in an equitable manner. Allowing students to select their own article presents advantages and drawbacks. Consistency in grading is another variable that is difficult to control with this type of study, as are issues surrounding faculty workload, student plagiarism, qualifications of the grader, learner readiness, and a number of other variables.

CONCLUSION

Based upon analysis of student performance, student response surveys, and potential sources of bias, this letter to the editor project seems to be effective as one step towards accomplishing the task of teaching and assessing critical appraisal and professional communication skills in chiropractic students.

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Utilizing Computer Graphics to Enhance Student Comprehension of Radiographic Imaging

Dennis Homack, D.C., C.C.S.P., New York Chiropractic College

Reading and understanding x-rays can sometimes be a challenge for those students who have difficulty visualizing three-dimensional anatomical structures on two-dimensional films. Given an opportunity to visualize photographs or drawings superimposed on the x-ray image, students have demonstrated a greater ability to interpret radiographic studies.

OBJECTIVES

The goal was to develop a rapid, simple method of reinforcing the student's understanding of radiographic images. This was achieved by integrating two perspectives: knowledge and visualization of anatomical relationships and radiographic interpretation.

METHODS

Radiographs of a given anatomical structure were digitized and stored as a jpeg or gif file. Artist renderings of anatomical soft-tissue structures were created and scanned into the computer, then saved as separate files. These illustrations were digitally manipulated to precisely fit over various structures visualized on the radiographs. The images were then used in a presentation program (Microsoft® PowerPoint® 97) so that layers of anatomical structures can be used over the initial radiograph.

During several lecture presentations offered to students enrolled in a noncompulsory elective course, the images were used during a brief review of anatomy. The review segments would range from 5 to 15 minutes, and were

used to reinforce and review lessons taught in previous courses.

Students were asked to respond to questions with regard to the effectiveness of the anatomically enhanced x-ray images used in presentations. The students were a cross section of individuals in their second year and later (fifth through eighth trimester students in a 10-trimester curriculum). These students have had a significant level of both anatomy and radiology before enrolling in the elective.

RESULTS/DISCUSSION

Students responded very positively to the visual aspect of the presentations. A numerical scale of 1–5, with 1 representing a low/unfavorable response and 5 being a high/favorable response, was used to quantify responses to specific questions. When asked if they felt the use of the technology helped their understanding, the average response was 4.4, with 87.5% responding favorably (rating of 4 or 5). When asked what they thought of the concept of the way these structures were explained, the average response was 4.3, with 84.4% responding favorably. Finally, when asked if they would be interested in seeing more use of this type of presentation, the average response rose to 4.5, with 93.5% of those that responded ranking the question 4 or 5. Of the 32 respondents, only four felt it did not contribute to their overall understanding of either radiographic interpretation or anatomical relationships. Out of those, only one ranked the desire for further use of the technology unfavorably (rating of 2).

Several students commented that the visual overlay of ligaments between osseous structure on the radiographs allowed them to recognize landmarks more easily on other films from different subjects. Other comments included a desire for other x-ray views. Suggestions were also made to include similar approaches to MRI and CT studies. One student commented that he felt they had enough anatomy and we were possibly wasting valuable class time.

CONCLUSION

Any time one can consider a structure or concept from different perspectives, the understanding of such things can be greatly enhanced and reinforced. We cannot assume every individual learns equally well as others utilizing any one method or technique. Since today's technology has given us powerful tools to explore new ways of seeing things, we as educators have both the opportunity and the obligation to utilize the full potential of our capabilities.

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Development of an Occupational Health Course for the Chiropractic Student

Dennis Homack, D.C., C.C.S.P., New York Chiropractic College

Interest in occupational health and ergonomics has grown significantly over the last several years, and will continue to do so in the coming decade. This interest is being fueled, in part, by the new pending OSHA standards on workplace ergonomics. With proper preparation and training, the doctor of chiropractic is well qualified to offer consulting services to companies for a variety of occupational settings.

OBJECTIVES

The goal was to develop a course that would prepare chiropractic students to become capable and comfortable with developing and promoting an occupational health and/or ergonomics program. The students must be able to integrate their understanding of human biomechanics and the human neuromusculoskeletal system with occupational situations. To achieve this, a student must also understand:

- Human biomechanical function during specific tasks and postures
- The function and organization of NIOSH, OSHA, and other government and private organizations (such as state workers' compensation boards).
- Methods of gathering information on specific workplace situations
- How to evaluate a given work environment, including commonly used tools and equipment
- Methods of evaluating individual employees (including the concepts of permanent impairment)
- Techniques in outreach, public speaking, and critical self-evaluation

DISCUSSION

Most government agencies, including OSHA and NIOSH, can be contacted using the Internet to gather information on agency organization and research, recommendations, and regulations concerning a number of occupational settings. The amount of information may be formidable. However, students must develop strategies for sorting through and finding pertinent information.

Discussions of body position, environmental questions, interaction between tools and equipment (human/machine interface) must be emphasized. Exploring job activities can be greatly enhanced with the use of video images. Various techniques can be employed to demonstrate the forces working on any given anatomical structure while an employee performs a given task. Explanations of biomechanical function during specific tasks will additionally provide students with an opportunity to integrate didactic information regarding anatomy and kinesiology with a clinical presentation of motion and common risks of injuries. Use of neurologic and orthopedic evaluation techniques will also be integrated during evaluation of the individual employee. Total and partial impairments should be discussed in the context of the guidelines accepted by various workers' compensation boards.

The chiropractor should also be able to integrate this collected information and present a clear coherent training presentation for the company employees. Finally, the student should be familiar with how to contact a company and promote the services that he or she can provide.

Student response to this type of program implemented at New York Chiropractic College has been very positive. Expansion of the current program is currently under consideration. Increasing interest in occupational health and ergonomics has provided an excellent opportunity for doctors of chiropractic to promote good health and safety through consultation services. The key to success in this ever more competitive environment will greatly depend on proper training and preparation.

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The Effect of a Rehabilitation Exercise Program on Head Repositioning Accuracy and Reported Levels of Pain in Chronic Neck Pain Patients
A Pilot Study

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The objectives of this study were twofold. The first was to determine if there was a difference in head repositioning accuracy (HRA) in chronic neck pain patients versus controls. The second was to assess what effect a rehabilitation exercise program had on chronic neck pain patients' HRA and reported levels of pain.

METHODS

A prospective, interventional study of chronic neck pain patients and control subjects was performed over a period of 4 weeks. Subjects who had experienced chronic or chronic recurrent episodes of neck pain (>3 months duration) were recruited for the study. An equal number of age- and gender-matched asymptomatic subjects were recruited as controls. Exclusion criteria included any form of active treatment (>1 treatment per month) for musculoskeletal disorders, including medication, congenital, or acquired spinal anomalies, arthritides, and any balance, coordination, or neurologic disorder. Subjects from both groups were randomly assigned to either a rehabilitative exercise group or a non exercise group. Outcome measures included HRA (helmet-mounted laser pointer and target) of all active cervical range of motion, pain intensity (100 mm visual analog scale), and pain frequency (daily diary). Subjects assigned to the eye–head coordination exercise groups were given written and verbal instructions as well as one training session. Exercises were to be performed twice daily for 4 weeks along with a daily diary of exercise completion and any symptomatology. Outcomes were measured at baseline, end of week 2, and end of week 4.

RESULTS

A total of 63 subjects were recruited to the study, of which 56 completed the 4-week trial. Twenty-eight chronic neck pain patients (14 males and 14 females; mean age 22.6 years, range 19–30 years) and 28 asymptomatic controls (14 males and 14 females; mean age 23.9 years, range 19–31) were randomly assigned to either a rehabilitation exercise or a nonexercise group. Active HRA was found to be significantly reduced in neck pain patients compared to control subjects (ANOVA, $p < .001$). Whiplash subjects ($N = 17$) in particular were significantly less precise in certain HRA movements compared to other neck pain patients ($p < .001$). There was a significant reduction in reported pain (ANOVA, $p < .001$) among the rehabilitation exercise neck pain group versus the nonexercise neck pain group. At 4 weeks, the rehabilitation exercise neck pain group has significantly improved their HRA in all active directions of movement (ANOVA, $p > .001$) compared to the other groups.

DISCUSSION

Currently, there is limited research on the effectiveness of rehabilitative exercises and functional improvement in neck pain patients generally, and chronic neck pain patients in particular. This study provides some evidence that simple eye–head coordination exercises that patients can perform, without interference to their daily activities, may be helpful in reducing functional impairment and reported levels of pain. This study also adds support to the suggestion that cervicocephalic kinesthesia, as measured by HRA, may be a valuable clinical outcome marker for the assessment of neck pain patients, and in particular trauma/whiplash patients.

CONCLUSION

Evidence from this pilot study shows some promise in the area of active rehabilitative exercises for the objective and subjective improvement of neck pain patients. Further research, such as randomized controlled clinical trials, may be indicated.

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A Web-Based On-line Daily Health Diary
A Feasibility Study

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Many health conditions studied in chiropractic research are of a chronic, and often cyclic, nature. These include conditions such as headache, dysmenorrhea, and premenstrual syndrome. The use of information in a daily diary to derive or supplement primary outcome measures is attractive. However, anecdotal experience indicates that daily diaries are often incomplete and/or not recorded on a daily basis.

This paper describes a study to assess the feasibility of collecting daily health diary information on-line using web-based technologies. This feasibility study will be conducted within a pilot project of chiropractic care for women with premenstrual syndrome (PMS).

METHODS

Recruitment for the pilot will begin in mid-August and continue through November 2000. Each study participant will be asked to keep track of her general well-being, any PMS symptoms, and medications or supplements used to alleviate PMS symptoms in a daily health diary for a month at a time. The on-line diary is being developed by a database administrator using Microsoft Interdev tools, Microsoft Access databases, and an NT server. It will contain exactly the same information as the paper diary. Initially, all project enrollees will be given the paper diary. During this period, the on-line diary will be tested, refined, and finalized. Beginning in October, enrollees will be given the option of using either the paper or on-line diary. The latter will require that the enrollee has daily Internet access. Individual login passwords will be provided and the project coordinator will demonstrate the on-line diary process at the baseline visit. Beginning in November, all participants will have the option of changing to the on-line diary for their second and/or third month of the study.

The on-line diary will be a web-based data collection screen; each participant's individual login password will bring up a blank diary with the participant's clinic ID, the date and the time automatically completed. The web site will be secured. The participant will complete each day's diary entry on-line. The data will automatically be stored in a secured Microsoft Access database at the research center, representing an example of real-time electronic data entry. The exit interview for the project will include asking the participants about their experience with the paper and/or on-line daily health diary.

RESULTS

Results will be complete by the end of February 2001. The outcomes of the feasibility study will be described, including:

1. any technical difficulties with the web-based data collection for the on-line diary;
2. the solutions to those technical difficulties;
3. the experiences of the study participants with the on-line diary, in particular the ease of use;
4. the frequency of reporting (number of days per month) for both the paper and on-line diaries; and

5. a comparison of frequency of reporting for those that used both the paper and on-line diaries during the project.

DISCUSSION

The results of this study will have implications on the feasibility of collecting on-line daily health diaries for patients enrolled in chiropractic research studies. This will provide us the opportunity to get extensive information on study participants' use and opinions of daily health diaries. It will also provide the opportunity to assess whether study participants are more likely to complete a daily diary on-line rather than on paper, and what tools can be used to enhance the daily reporting (such as e-mail reminders with links to the web page). Finally, if the results of this study indicate that on-line health diaries are feasible for chiropractic research studies, future studies will be designed to assess the reliability of the information collected through this web-based mechanism.

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The Importance of Student Evaluations in Assessing Faculty Teaching
A Review of the Literature

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Within the last few decades, there has been substantial pervasion of business concepts throughout Academe. The business world's concepts of productivity, accountability, and efficiency defined by inputs and outputs are not going away anytime soon. In general, many measurements of faculty work remain rudimentary and, at times, of questionable validity. As accountability for productivity continues to rise, there is proportionally increased attention toward developing methods of assessment of faculty work. Of the trilogy of faculty activities (teaching, institutional service, and scholarship), teaching is arguably the most difficult to assess. Teaching takes on many ambiguous forms as a process, and equally diverse manifestations in the learner. Traditionally, the most popular method of assessment involves gathering data from students. As targets of the learning process, students' feedback is a logical perspective for best assessing a teacher's effectiveness in such things as course presentation and design, availability for question, and the learning environment. The goal of this investigation is to review the educational literature on student evaluations to determine what has been discovered about the strengths and limitations of this popular mode of assessing teaching in higher education.

METHODS

The educational literature was searched using the keywords: faculty, evaluation, students, and teaching. The search frame included journals and documents indexed in Medline and ERIC from 1966 to current (July 2000). The keywords were entered as text words, searching the authors, title, and abstract of the indexed articles. A total of 75 articles were identified from the electronic databases and hand searching of the articles' references. Student evaluations were the primary topic of about one-third of those identified. The articles were categorized for their contribution to concepts of reliability, validity, application, and limitations.

RESULTS AND DISCUSSION

Most of the research on validity has focused on the types of questions that should comprise the student survey instrument. There is strong correlation to the evaluations of teaching carried out by students when compared to evaluations by professional external evaluators. Even with low sample sizes (as few as 10), student comments closely agree with observations of objective evaluators. Researchers found that both qualitative and quantitative formats led to similar results. Additionally, they found student surveys to be reliable and to demonstrate clear differences in the ability of faculty to teach. When performed with attention to appropriate processes of data collection, student evaluations provide useful data regarding faculty effectiveness in teaching. This information can be used to make summative decisions on tenure, promotion, reappointment, and salary. However, an arguably more valuable use of the data obtained from student evaluations is to use the data for a formative goal related to developing plans for personal growth and achievement. Most authorities caution against the sole use of student evaluations as a means of assessing teaching. Student evaluations need to be coupled to peer evaluations, teaching portfolios, and other innovations to assess teaching.

CONCLUSION

A careful review of the use of evaluation methods prescribed in the literature and the current use in chiropractic colleges needs to be performed. Beyond simply ensuring there are sound data collection processes in place, the chiropractic profession could benefit from developing a close tie between student evaluations and faculty development programs. The overwhelming evidence of this literature review is that student evaluations are valid, reliable, and useful as an important and convenient component of faculty evaluation. The literature supports the inclusion of faculty evaluation and faculty development as essential components of any excellent teaching program.

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Issues Faced in Developing and Implementing an On-line Postgraduate Educational Program

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The Internet is quickly becoming a necessary medium for today's advancing health care professional. Using the World Wide Web as a medium for education is rapidly advancing, though significant studies on the quality and outcome of such education are lacking. Issues that attract educational institutions to the lure of adopting "on-line education" include: bringing the information to the consumer, gaining competitive advantage, perceived potential for revenue, and requests by doctors for additional continuing education options. This paper will provide insight into the issues faced in the integration and implementation of on-line learning modules in the Palmer's Institute for Professional Advancement's Certified Chiropractic Sports Practitioner (CCSP) postgraduate educational program. The program currently consists of 127 doctors of chiropractic enrolled in four programs in four different states.

METHODS

The methodology used to develop on-line courses includes the following areas: analysis, planning, design, assessment, and implementation of the program. Each of these areas is discussed in relationship to the necessary resources required in order to attain a learning environment.

RESULTS

The course currently has 127 enrolled participants. A number of issues regarding contracts and appropriate resources and training for the development of the program were encountered. This delayed the development of significant components of the on-line learning modules. More appropriate instructor orientation was clearly needed. Preliminary data indicate that the technology-mediated collaborative learning environment is not generating an acceptable level of participation. It is clear that there is a need for more explicit guidance to engage students. More than 50% of the students have not made it past the initial system evaluation for participation in the on-line course. While this course is currently still in progress, participants may be procrastinating.

DISCUSSION

The necessary on-line education development team is one that should include a curriculum developer, course author, instructional designer, course editor, and a technical staff person. These roles must be clearly defined for on-line courses to be successful. Diligence in following the development methodology is essential in providing faculty with guidelines and support to be effective on-line teachers. Analyzing the student requirements and the course goals is an essential first step. The time spent here will save resources to deliver to the student's expectations.

Assessing the success of the program requires more than just exams. The on-line environment requires new strategies that accurately reflect the learning environment such as threaded discussion, chat rooms, e-mail messages, and group projects.

On-line courses differ greatly from face-to-face courses. It was found that on-line course participants harbor very different expectations than those of face-to-face courses. Managing these expectations from the inception is crucial to the attainment of a successful learning environment. On-line students require more explicit guidance on progress through the course with more communication from the instructor to motivate and set milestones throughout the life of the course.

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The Effect of Group Case Study on Chiropractic Students' Appreciation, Knowledge, and Confidence in Prescribing Therapeutic Exercise and Nutrition for Patients

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The purpose of this study was to determine if a group of seventh-trimester students gained a better appreciation, knowledge, and confidence in prescribing therapeutic exercise and nutrition for patients after engaging in a group project that required them to develop a comprehensive treatment plan.

METHODS

Fifty-four chiropractic students who were enrolled in courses in clinical nutrition and therapeutic exercise were organized into work groups of four. Each group was given a case history that described a patient's chief complaint, history of injury, illness, and signs and symptoms. The groups were charged with arriving at a working diagnosis and developing a comprehensive treatment plan that included exercise, nutrition, manual therapy, soft-tissue techniques, and physiotherapies. The groups were also instructed to describe appropriate re-examination procedures for their case. The cases, which were developed from clinical encounters with chiropractic patients, included disc syndromes, instabilities of the spine, sprain and strain, and chronic joint dysfunction. Each case also presented with a problem of a systematic nature including diabetes, anemia, hypoglycemia, or obesity. The groups were given 1 week to develop their treatment plan and then make a presentation to the other students. Presentations were 15 minutes in length and followed by a question and answer period. A four-question survey using the Likert approach was given to the students at the start of the project and immediately after completion of their presentation, to assess for change.

RESULTS

When students were asked about their appreciation of nutrition and exercise prior to the group case study project, the mean was $81.3 + 2.9\%$ compared to $88.3 + 1.7\%$ after the group study experience ($p < .05$). The second question, which assessed the students level of confidence in prescribing exercise and nutrition, was similar with a prescore of $48.5 + 2.7\%$ and a postscore of $68.7 + 2.7\%$ ($p < .001$). The third question asked students to rate their knowledge of re-examination procedures in the areas of exercise and nutrition. Prior to the group case study, the mean was $45.1 + 2.9\%$ and following completion of the project, it was $65.0 + 2.4\%$ ($p < .001$). Question 4, which asked students to rate their knowledge assessing the effectiveness of exercise and nutrition, found a pretest mean of $49.0 + 2.9\%$ and a post-test mean of $65.9 + 2.5\%$ ($p < .001$).

DISCUSSION

Therapeutic exercise and nutrition can be very valuable components of a chiropractic treatment plan, but only if they are actually included in the treatment regime. The authors have observed that chiropractic students rely less on these modalities as they engage in their clinical experience, possibly due to a lack of confidence or apathy about their value. Patient care may be negatively affected when that happens. Through a project that had students work in small groups and select appropriate exercise and nutrition as part of a comprehensive plan, it was shown that their confidence, appreciation, and interest in these modalities markedly increased. The authors feel that group activities of this nature may be an important tool for instructors who teach in disciplines such as clinical nutrition and therapeutic exercise in chiropractic settings.

Assessing Success in Masking Patients to Treatment Group Assignment in the Sham-Controlled Chiropractic Clinical Trial

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Palmer Center for Chiropractic Research

The "gold standard" of assessing clinical therapies is the randomized sham- or placebo-controlled trial (RCT) in which both patient and clinician are masked (the preferred term to "blinding") to treatment group assignment. It is impossible to mask a clinician who administers a manual therapy, and so the single-masked approach is favored in chiropractic trials. Patient expectations of treatment effects influence their responses; thus, all patients in the RCT must experience a positive encounter with the clinician such that they similarly believe they may be in the active group. This paper explores the relationship between "naive to chiropractic" and successfully masking patients to treatment assignment.

METHODS

Data were collected during a multisite clinical trial investigating the effects of chiropractic care for women with chronic pelvic pain (CPP). The study required that patients be "naive to chiropractic" which was operationally defined as not having been under chiropractic care 1) during the previous year, and 2) at any time for the treatment of pelvic pain (by patient report). Subjects were asked if they had ever received chiropractic care, although this was not cause for exclusion.

Patients were randomly assigned to 6 weeks of either the active treatment (chiropractic flexion–distraction and manual trigger point therapy) or the control (sham chiropractic manipulation combined with effleurage). After 12 weeks, patients completed a questionnaire asking them to comment on which treatment they thought they had received and why. Patients were then unmasked.

RESULTS

Of 322 subjects completing the first screening, 169 were ineligible. Of these, 59 were excluded only for being not naive to chiropractic, and 54 for multiple reasons, at least one of which was being not naive. There were 39 patients enrolled: 19 in the sham group, and 20 in the active group.

About half the patients were correct in guessing their treatment assignment. The sham group was equally divided in their perception of group status regardless of prior chiropractic exposure. Patients in the active group with prior chiropractic exposure more accurately guessed their treatment assignment. Several patient comments suggested that their perception had been influenced by outcome of care.

DISCUSSION

Communities surrounding chiropractic colleges conducting clinical studies are frequently saturated with chiropractic patients. Requiring patients to be "naive to chiropractic" may have impacted enrollment in this study. Yet there is no convincing evidence that patients' prior chiropractic exposure impacts accuracy in guessing treatment assignment.

The sham procedure in this study appears believable, with accuracy only in about half of all patients' guesses of treatment group assignment. In the sham group, about half of the patients' guesses were accurate, regardless of prior chiropractic exposure. The experienced group more accurately guessed, yet this may not impugn the believability of the sham; inexperienced and experienced patients in the sham group were equally accurate. It was the active group in which experienced patients more accurately guessed.

Perceptions of group assignment were collected after completing treatment. This may be a limitation of this study inasmuch as the treatment effect may have influenced patients' guesses.

CONCLUSION

Investigating the relationship between prior chiropractic experience and patients' perception of group assignment may help determine whether being naive to chiropractic is necessary for successful masking. Sham-controlled clinical studies should have a mechanism for inquiry as to patients' perception of their treatment group assignment. Recruitment for chiropractic clinical studies will be impacted based upon whether or not the "naive to chiropractic" criterion is ultimately deemed vital to successful patient masking.

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Formative Peer Review of Teaching Delivery
Planning Process and Application

Rita Nafziger, M.B.A., and **Paul Mullin**, D.C., Palmer College of Chiropractic

In an effort to create a uniform peer review process for classroom teachers, administration requested that such a process be designed and administered through its new Center for Teaching and Learning. An assistant from the President's Planning Office initiated the project and assumed the role of facilitator. Four other faculty members, including the director of the Center for Teaching and Learning (CTL), completed the task force to develop the process. After the first 2 months of preliminary meetings, the director of the CTL became the facilitator and coordinator of the project.

The task force reviewed materials from current journals, texts, the Internet, and in-house documents relevant to peer review procedures. The following goals for the teaching delivery project were established:

1. To improve instruction as well as support and maintain a high-quality faculty
2. To foster discussion among teachers and promote collegiality
3. To better support curricular integration
4. To validate and confirm a match between syllabus and what is taught
5. To document observations for the purpose of discussion with colleagues
6. To promote goal setting among teachers

In order to achieve the desired goals, the task force agreed that the peer review process must be formative and focused on improving teaching skills. It was critical that faculty help create and drive the process. Eight new members joined the group (four from the Faculty Senate and four from the faculty at large) for the subsequent development and pilot phases.

The timeline for development and implementation of the peer review process is as follows:

March 1999	Request from Administration and planning began
March–August 1999	Literature search and review, project goal setting
June 1999	Draft of plan and timeline approved by Administration
July 1999	Faculty In-service roundtable discussion to introduce plan
August 1999	Solicit faculty participation in plan development and pilot
September 1999	Peer review training for faculty volunteers
October 1999	First pilot of process among expanded task force members; refining of procedure and review instruments
November 1999	Faculty In-service focused on peer review status report and gathering of additional input from full faculty
January 2000	Second pilot with teachers other than task force members
February 2000	Survey of all pilot participants
March 2000	Launch of formative peer review program
April–July 2000	Five requests for peer review

Lengthy discussion in defining the term "peer" occurred over several meetings. Some were concerned with a person from a different content area being a reviewer, others were uncomfortable being reviewed by teaching staff who did not hold full-time faculty rank or those with limited teaching experience. Yet others welcomed input from any colleague who would take the time to observe their classes.

Our premise was that peers can and should help improve instruction and curricular integration, while at the same time cultivating program-wide collegiality. We felt the peer review process could be a vehicle to accomplish this, but only if the process was strictly formative in nature. Traditional summative evaluations had been used so exclusively in the past that it continues to be a challenge to train reviewers in reflective discussion techniques and maintain the principle that the reviews are solely for teacher improvement.

Will a voluntary and formative peer review process endure? Our prediction is that sustaining a voluntary program like this will require periodic marketing and positive incentives. Thus far, the new process has met with favorable responses from those who participated in the pilot trials.

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Alternative Curriculum Delivery
Student and Faculty Reaction to On-line Instruction

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This paper recounts the design and construction considerations in developing an on-line course for core curriculum delivery at New York Chiropractic College (NYCC). The design and evolution of this pilot course, as well as student and faculty reactions to its implementation, are discussed.

METHODS

- Educational literature search
- Investigation of courseware and software
- Access considerations (feasibility)
- Assess student response and performance

RESULTS

A primary delivery decision was whether to develop stand-alone web pages/sites or use existing courseware. Use of an established courseware template was selected based on the following criteria:

- User-friendly, flexible software that allows easy upload and tracking of use
- Allows interaction through a discussion board and e-mail
- No requirement to download software to individual machines
- Minimal dependence on the College's Computer Services Department
- Low cost to implement

In researching the design of an on-line course, the need to balance several issues and concerns became evident. Predominant among them were:

- Reconciling the desire to move to a student-centered instructional method (greater student engagement) with the realities of a heavy trimester credit load (high number of in-seat hours)
- Balancing individualized student feedback with large class size and faculty contact time
- The need to keep students on task within a reasonable time frame to facilitate on-line discussion
- Balancing the use of "anytime, anywhere" asynchronous instruction with the realities of attendance requirements

Lecture handouts to be delivered electronically were reconstructed in a more "conversational" style with clinical correlation and personal reflections. Time was required to obtain copyright permission and scan images for inclusion in lectures. Conversion time was minimal. Additional time was necessary to customize the course site, write and upload discussion board questions, course documents, and assignments; and set up groups on e-mail.

Informal polling of students about personal access was completed and facilities in the College computer laboratory and library were assessed to ensure access. In order to facilitate student success, we developed an on-line booklet.

The final design was that of electronic delivery of syllabi, course requirements and reading assignments, on-line lecture notes, group and individual discussion board posting requirements, direct e-mail for announcements and assistance, and optional classes for review.

DISCUSSION

Student feedback suggested ongoing alternation in course delivery. The resulting student opinions are mixed. Students like the flexibility of asynchronous access but also feel that live lectures are important. Response to expressed concerns or questions was individualized and prompt. Deadlines for response to discussion board questions kept students on track. Although a similar amount of time was spent on the content of the course (1–4 hours) compared to strict didactic presentation, the students were more engaged in understanding of the material. The possibility of being a passive attendee in the class had been eliminated.

CONCLUSION

The milieu of chiropractic education puts unique demands on the student, among them a high level of required attendance time and little opportunity for synthesis. This pilot course illustrates just one method to address these concerns. The method of delivery of this course not only allows "anytime, anywhere" access to course materials, but also seeks to familiarize students in use of the computer and its technology. Most will face the need for familiarity with these procedures in practice, due to managed care networks, electronic billing, reliance on Internet resources, and asynchronous delivery of continuing education.

Enhancing the Learning Environment through Qualitative Evaluation

John Stites, D.C., D.A.C.B.R., Palmer College of Chiropractic

Up until the spring of 2000, the Palmer Chiropractic Clinics used two OSCE (Objective Structured Clinical Examination) format examinations as part of an overall student assessment program. In the spring of 2000, one of these examinations was replaced with a Qualitative Entrance Assessment. The purpose of the new format was to move from a summative test to a formative assessment. This paper describes the rationale for changing the examination format and the concepts proposed in developing the qualitative assessment and reports on the outcome of a survey of students going through the new process.

MATERIALS AND METHODS

The Qualitative Entrance Assessment was designed to address the same competencies as the OSCE Entrance Examination that preceded it, with the additional competency of patient communication. The assigned clinician performed the assessment with no specific questions or set time frame. The examiners were encouraged to evaluate the student in order to get a clear picture of the student's strengths and weaknesses. The examiner would role play a history, ask the students to demonstrate aspects of the physical examination, demonstrate technique setups, and explain the reasons for their care as if to a patient.

The outcome of the assessment was a written educational evaluation. This was a relatively unstructured description of the students' educational status with recommendations for development.

The concept of the new assessment was presented to the clinic faculty during a training module 2 weeks prior to the assessment. The goals of the assessment were reviewed and the format of the written educational evaluation discussed. A focus of the training module was the difference between a summative evaluation and a formative assessment.

After the assessment, a survey was conducted of the students to get feedback on their perceptions of the value of the assessment. This survey was conducted 1 month after the assessment in a classroom setting.

RESULTS

Twenty faculty examined 138 students with the new format. The faculty provided written educational evaluations based on the interactions. There was some initial faculty reluctance to shifting to a new system. Expressed concerns included time and the potential for inconsistency between faculty. There seemed to be confusion as to the nature of a formative evaluation. After the evaluation, a number of faculty reported that they appreciated the opportunity to gain a clear concept of their assigned students' capabilities and needs.

The written educational evaluations reflected the intention of the changed format by providing an outline of the students' strengths and weakness and making recommendations for future development. A survey of 61 students who participated in the assessment indicated a high degree of satisfaction with the new examination format. There is strong agreement that the students received useful feedback, that the examination was a learning experience, and that the current format is an improvement over prior formats.

DISCUSSION

In any educational institution there is always the challenge to develop a student assessment program that is effective and appropriate to the available resources. Moving toward a more qualitative assessment would provide a better assessment of general competency.

CONCLUSION

By creating a different style of test, the overall assessment system is more multifaceted, which has the potential to provide a more accurate assessment of the student. This formative assessment joins the OSCE proficiency exam, the patient encounter qualitative grade, quantitative requirements, and the faculty evaluation in the overall student clinical assessment program.

Influence of Student Study Methods on Outcomes of Physical Examination Skills Assessment

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The chiropractic curriculum includes training in new psychomotor skills. Students are encouraged to invest time repetitively performing these various activities to achieve proficiency and efficiency. An assessment of the impact of student practice styles on skill proficiency in physical examination procedures was undertaken.

METHODS

Subjects were 84 third-trimester chiropractic students at the Los Angeles College of Chiropractic in an introductory physical examination course. Students were encouraged to practice outside class in groups of three, taking turns being doctor, patient, and evaluator. Instruction in the performance of the examination procedures consisted of demonstration and explanation in the classroom, followed by immediate in-class practice, with time usually sufficient for only a single repetition of each procedure.

Each student was evaluated six times for proficiency at performing examination skills. Each evaluation consisted of three physical examination procedures in a time-restricted setting, including verbal description of a possible abnormal finding and corresponding indication for each procedure. Assessment of proficiency utilized a standardized checklist.

A survey item was included on the written final examination for the course, asking how students had prepared for the skill assessments. Choices included: no preparation; frequently reading about the procedures or talking about them without performing them; practicing infrequently with other students; practicing on friends or family; and regular practicing on other students with an evaluator present. Student responses to this survey item were correlated with assessment scores.

RESULTS

Of the 84 students who entered the course, 82 (98%) completed the course and responded to the survey item. The mean exam proficiency score was 66/90. One student reported having made no preparations for evaluations, and had a score of 61/90. Fifty-three students reported that their preparation consisted of frequently reading about or talking about the procedures; the mean score of this group was 68/90. Fifteen students reported practicing on friends or family; the mean score of this group was 61/90. Six students reported infrequent practice with other students; the mean score of this group was 61/90. Seven students reported regular practice in the presence of an evaluator; the mean score for this group was 70/90.

DISCUSSION

It was surprising to find that a majority (54/82; 66%) reported that they did not practice the procedures, and to note that there did not appear to be any advantage to practicing the procedures as compared to reading or talking about them. While these results contradict previously published research on psychomotor skills, there are several potential confounding factors in this study. The assessment of examination skills may not be valid. The ability to assume the correct body position while holding the correct instrument is insufficient to ensure a valid physical examination procedure. A better assessment method would be to utilize patients with known examination findings, and evaluate the student's ability to correctly detect and interpret findings. Unfortunately, sufficient resources for this are generally unavailable.

Placing the survey item on the final examination could exert an influence over the response, since the responses were not anonymous. It is doubtful this occurred, as few responses matched the "ideal." An anonymous response would obviate this concern, but would also make it impossible to correlate study habits with evaluation outcomes.

Small sample size for all groups other than that reporting study by reading or talking makes meaningful statistical comparison impossible. It is not possible to generalize the results obtained from this single cohort to larger student populations.

CONCLUSION

Preliminary findings indicate that in our setting, student study methods did not influence the outcome of assessment of physical examination skills. Definitive conclusions will require acquisition of a larger data pool and the development of validated assessment instruments.

Exercise Recommendations by Chiropractors and Standards of Care

Anne-Marie M. Weinert, D.C., and **Dan Weinert**, M.S., D.C., D.A.C.R.B., Palmer College of Chiropractic

The Job Analysis 2000 survey conducted by the National Board of Chiropractic Examiners revealed that 98.0% of the chiropractors surveyed utilize corrective or therapeutic exercise in their practice. This astounding percentage prompted the authors of this study to determine what, if any, prescreening and/or monitoring tools are being utilized to ensure quality standards of care. The American College of Sports Medicine's *Guidelines for Exercise Testing and Prescription* indicate that there are standards that must be followed when recommending exercise to any individual. Exercise intensity is not dependent on the type of activity. Since this is true, an objective means must be utilized to monitor the patient's level of intensity. One noninvasive method of doing this is to establish the patient's target heart range. Heart rate is a good index of physiological intensity. There is a simple formula that exists to provide a range for a patient to exercise within to ensure they remain at 40%–60% (moderate) of maximal intensity. Utilizing this objective measure allows the doctor to monitor a patient's level of exertion regardless of the type of activity. There are other objective measures that can be utilized to monitor a patient while exercising in the doctor's office. While the patient is exercising, the use of a modified Borg scale provides an objective score to the patient's perceived level of exertion. Additionally, blood pressure has a standard response to low force dynamic activity. Monitoring blood pressure during exercise provides valuable information on patient response to that exercise. If blood pressure is monitored during the initial exercise sessions, any abnormal response will be recognized early. While these measurements may be time consuming for the doctor, they are considered exercise standards of care.

METHODS

The sample group for this study was chosen from a list of chiropractors who are members of the Iowa Chiropractic Society. Approximately every fifth doctor on the list was contacted, by telephone, until a list of 50 responses had been recorded. A survey was developed to assess the utilization of important preparticipation screening and monitoring methods. The focus of the survey was the assessment of exercise recommendations by chiropractors. Several variables were analyzed in the recommendation of these activities. The chiropractor was surveyed for whether they recommend aerobic and rehabilitative activities to their patients. They were further questioned as to what, if any, objective tools they used to screen patients prior to suggesting the activity. Finally, analysis was performed of the objective tools utilized while the patient was exercising.

RESULTS

Preliminary results indicated that 74% of the doctors surveyed recommended some form of aerobic activity for their patients. Of this 74%, 70% did not use the PAR-Q, or any objective means, to screen their patients prior to recommending exercise. Additionally, 74% of those recommending aerobic activity did not set a target heart range for their patients.

DISCUSSION/CONCLUSION

Since the majority of the chiropractic profession recognizes the importance of recommending therapeutic exercise for their patients, it is vital that standards of care are upheld. These standards include proper screening, recommendations, and monitoring of the patient during the exercise. The absence of minimal standards of care could lead 98.0% of the chiropractic profession to be open to liability by risking the safety of their patients.

The Effect of Chiropractic Manipulation on Salivary Cortisol Levels
A Pilot Study

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Cortisol is a steroid hormone secreted by the adrenal glands. It is essential for life, and it has effects on most cells in the body. Cortisol is an integral part of glucose metabolism, as it stimulates gluconeogenesis, resulting in increases in blood glucose levels. Cortisol also has anti-inflammatory effects. It acts to decrease local swelling and pain by blocking early stages of inflammation. Almost any type of physical or mental stress can lead to enhanced secretion of cortisol within minutes of the presence of a stressor.

While many hormones increase in response to stressful stimuli, cortisol has been used as an accurate measure of the stress response system. Furthermore, salivary cortisol has been shown to be a valid and reliable measure of unbound, "free" cortisol levels as compared to the unbound hormone levels in blood. Since saliva can be collected relatively stress free, this method of measuring cortisol levels is particularly useful when conducting stress research with humans. Spinal manipulative procedures may inherently produce physiologic stress on those receiving this form of conservative treatment. Spinal manipulative therapy (SMT), with its hallmark high-velocity, low-amplitude (HVLA) impulsive thrust, may indeed lead to some degree of physiologic stress due to paraphysiologic joint space excursion. By monitoring salivary cortisol levels pre- and post-SMT, useful information regarding the magnitude of physiologic stress that may be induced as a result of the SMT procedures may be elicited.

OBJECTIVES

The purpose of this pilot study was to collect preliminary data that may assist in establishing the potential for additional studies involving the reactivity of the stress response and chiropractic manipulation. Primarily, this study was designed to determine if basal salivary cortisol levels can be properly detected and to determine if chiropractic manipulation has any direct effect on salivary cortisol levels in human subjects.

METHODS AND MATERIALS

The subject population for this study included 30 asymptomatic male students. Upon inclusion to the study, subjects were randomly assigned to one of three experimental groups: control, sham, and chiropractic manipulation. The study was a 5-week trial. During the first week, basal morning salivary samples were collected for 5 consecutive days at home. During weeks 2–5, testing occurred on 1 corresponding day each week in lab. On the days of testing, the subject collected a home sample, then in lab, an initial sample was collected 5 minutes prior to treatment. The appropriate treatment for each experimental group was delivered, and a time course of salivary samples was collected at 5, 15, 30, and 60 minutes post-treatment.

Plain cotton Salivettes (Sarstedt) were used for the quick, hygienic collection of saliva. Free, unbound cortisol was measured from saliva samples using a commercially available enzyme-linked immunoassay (Salimetrics, LLC).

Data were analyzed by ANOVA procedures with the level of significance set at $p < .05$. When appropriate, analyses for simple and main interaction effects was performed using Neuman-Keuls procedures.

RESULTS

The home samples collected throughout the study did not differ between the experimental groups. The in-lab time course of acute changes to cortisol levels that was collected on each of 4 test days during weeks 2–5 for each treatment group did not differ. The in-lab data collected produced a decreasing time course of salivary cortisol levels in all groups. Collapsed data reveal a linear decline in cortisol levels between home samples taken approximately 65 minutes prior to treatment and samples taken 60 minutes post-treatment.

CONCLUSION

The results of this pilot study suggest that chiropractic manipulation has no effect on salivary cortisol levels in asymptomatic subjects. Therefore, the authors conclude that neither the anticipation of chiropractic manipulation nor the spinal manipulative procedure itself induces a state of stress or anxiety.