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Case-Based Online Modules to Teach Graduate Level Nursing Students About Complementary and Alternative Medical Therapies

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Abstract

We integrated CAM-related content into selected core courses in our master's-level curriculum. To facilitate students' application of the content, we developed evidence-based online case studies and evaluated their effectiveness by comparing students' pretest and posttest scores on multiple choice quizzes. Findings suggest that evidence-based online case studies are an effective strategy for teaching graduate nursing students about the clinical issues surrounding patients' use of CAM therapies.

Keywords

online case studies; complementary/alternative therapies; graduate students; pretest/posttest

A groundbreaking study by Eisenberg et al. (1993) revealed that in 1990, over 30% of Americans sought treatment from alternative health care practitioners and made more visits to these practitioners than to conventional medical providers. Since that time, the use of CAM therapies among American adults and children has increased. Recent data from the 2007 National Health Interview Survey indicate that 38% of adults and nearly 12% of children in the United States used some form of CAM in the preceding 12 months. While overall CAM use was comparable to 2002 levels (Barnes, Powell-Griner, McFann, & Nahin, 2002), the use of deep breathing, meditation, massage, and yoga significantly increased (Barnes, Bloom, & Nahin, 2007). Adults used CAM therapies most often to manage musculoskeletal problems, while children used CAM to manage back and neck pain, colds, anxiety, and Attention Deficit/Hyperactivity Disorder. CAM use was greater among non-Hispanic whites compared to racial minorities, and was more likely to be used when access to conventional care is limited (Barnes, Bloom, & Nahin, 2007; Su & Li, 2011). More recent

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studies continue to find a high prevalence of CAM use across a wide range of populations in the US, including military veterans and their families (Kent & Oh, 2010), pediatric cancer patients (Bishop, Chan, Lewith, & Prescott, 2008), breast cancer survivors (Saqib et al., 2011), infertile couples (Smith et al., 2010), and persons with common neurological conditions (Wells, Phillips, Schachter, & McCarthy, 2010).

The growing use of CAM therapies by the American public may be related to a number of factors. A recent systematic review of 94 published studies identified four themes that underlie patients' use of CAM therapies (Bishop, Yardley, & Lewith, 2007). First, patients believe that CAM therapies empower them to take control of their own health care; CAM practitioners typically encourage patients to be equal partners in all treatment decisions. Second, CAM users are apt to believe that mind-body connections underlie their illnesses and responses to treatment. Third, CAM therapies are perceived as "natural" and "holistic." Fourth, CAM therapies are compatible with patients' broader belief systems, such as spiritual or environmental beliefs.

Other factors have also contributed to the upswing in CAM use in recent years. These include (a) increased numbers of third party payers who provide coverage for CAM therapies, (b) aging of the population, especially Baby Boomers, with an attendant increase in chronic illness which may be refractory to or only partially ameliorated by conventional medical therapies, and (c) increased immigration of persons from developing countries who may be distrusting of Western medical care and more likely to seek traditional healers for their care.

Yet, despite increased CAM use by their patients, conventional health care providers (a) often lack sufficient knowledge of CAM therapies and their role in health and healing, (b) are unaware of how to appraise the safety and efficacy of CAM therapies, and (c) lack the requisite expertise to collaborate with CAM practitioners to provide patients with an integrated approach to care (Brown et al., 2007; Kemper & O'Connor, 2004). These knowledge deficits are concerning because CAM therapies have been associated with serious and even life-threatening adverse events. For example, patients who use plant-based dietary supplements are at risk for developing post-operative bleeding if they do not terminate their supplement use prior to surgery (Basila & Yuan, 2007). Thus, conventional health care providers need to understand the safety and efficacy issues pertinent to widely-used CAM therapies, incorporate assessment of CAM use into their history and physical examinations, and collaborate with CAM practitioners to provide an integrated, and safe, approach to care.

For advanced practice nurses, knowledge of CAM therapies is necessary to achieve selected competencies outlined in *The Essentials of Master's Education for Advanced Practice Nursing* (American Association of Colleges of Nursing, 1996) (see Table 1). Lacking CAM-related knowledge can undermine nurses' ability to forge effective partnerships with their patients that will maximize adaptive responses to illness and promote wellness.

In response to conventional providers' lack of CAM-related knowledge, the National Center for Complementary and Alternative Medicine (NCCAM) awarded funds to 14 medical, nursing, and allied health care schools between 2000 and 2003. These schools were charged with integrating CAM content into their existing curricula and evaluating student outcomes. Rush University College of Nursing received this funding in 2000 and developed an integrated CAM curriculum for both its prelicensure and master's-level programs. In this paper, we describe evaluation data pertinent to one component of the master's-level curriculum: evidence-based online case studies.

Methods

Our approach to developing an integrated CAM master's-level curriculum was two-pronged. First, we developed CAM content that aligned with the Master's Essentials that were pertinent to managing patients who use CAM (Table 1) and incorporated the content into three existing core courses that are prerequisite to the specialty management courses: pharmacology, research methods, and physical assessment. Second, we developed and delivered evidence-based online case studies in the students' specialty management courses to facilitate their critical thinking skills and their ability to apply the CAM content. A total of four case studies were developed which addressed CAM use among patients with the following diagnoses/symptoms: depression, low back pain, asthma, and empacho. We selected these diagnoses/symptoms because they were among the most frequent conditions cited by adults and children for using CAM therapies at the time the case studies were developed (Barnes, Bloom, & Nahin, 2008). The case studies depicted patients using CAM therapies that had safety issues and/or were contraindicated with their current conventional treatment plans. The case study format is described in Table 2, while an example can be found at: <http://ce.nurse.com/RetailCourseView.aspx?CourseNum=60141&page=34&IsA=1>

Each case study was developed by one or two members of the CAM faculty team who had expertise related to the clinical issue or therapy. Faculty conducted literature reviews to appraise the evidence related to the safety and efficacy of the therapy and incorporated this evidence into a scenario drawn from their clinical experience. The case studies were reviewed by other CAM faculty and advanced practice nurses to ensure clinical relevance, adherence to the Master's Essentials, and alignment with core course CAM content.

Each module was written as an unfolding scenario that involved the presentation of a patient using a CAM therapy to manage a clinical problem. The history and physical examination data revealed an adverse effect or contraindication, however, the patient wished to continue using a CAM therapy. The student was asked to recommend a more appropriate CAM therapy and to evaluate clinical data from the follow-up visit. As they completed each module, students were directed to several online information sources about the therapy and asked to evaluate their credibility (see Table 3 for a list of evidence-based online resources). Reflection questions were posed periodically throughout the modules to stimulate students to consider their own beliefs about CAM therapies and the patients who use them.

To evaluate the effectiveness of the case studies, students completed multiple-choice pretests and posttests prior to and immediately after completing the case study. The test questions were written by the faculty who developed the case study and were designed to measure application of knowledge, rather than memorization of facts. All test questions were reviewed by CAM faculty and advanced practice nurses for their relevance to the CAM content delivered in the core courses and their match with the case study information.

All master's level students were required to complete two online case studies during their clinical management courses. Pretest and posttest scores were compared using paired t tests. Institutional review board approval for the study was obtained and informed consent was waived because the methods were considered part of the students' educational process.

Additionally, we evaluated our CAM educational efforts by eliciting student feedback upon completion of their master's degree program. All students were asked to complete an online survey to assess their perceived competency related to advanced practice nursing. Two survey items related to the following CAM competencies: (a) incorporate knowledge of complementary and alternative medicine into clinical practice, and (b) collaborate with practitioners of complementary and alternative medicine.

Results

Between 2003 and 2006, students in four separate specialty management courses (family nursing, pediatrics, adult health, and anesthesia) completed two case studies and the associated pretests and posttests. Posttest knowledge scores significantly improved for all four case studies (see Table 4). The end of program survey was completed by 248 students who completed their master's degrees between 2004 and 2009. Ninety percent of the respondents reported that they were "well-prepared" for each of the two CAM-related competencies.

Discussion

The use of CAM therapies by the American public has increased dramatically in recent years, permeating nearly all sectors of society. Recent studies have documented high rates of CAM use by children (Bishop et al., 2010), older adults (Bell et al., 2006; Cheung, Wyman, & Halcon, 2007), veterans (McEachrane-Gross, Liebschuts, & Berlowitz, 2006), cancer patients (Fouladbakhsh & Stommel, 2008), and ethnic minorities (Hsiao et al., 2006), to name just a few.

Interestingly, the most commonly used CAM therapies among both adults and children in 2007 were dietary supplements other than vitamins and minerals (Barnes et al., 2007). While over-the-counter dietary supplements typically have GRAS (generally recognized as safe) status and are thus exempt from FDA premarket review and approval, many commonly used supplements have been associated with serious adverse events and clinically significant drug interactions. For example, black cohosh, commonly used to manage menopause-related hot flashes, has been associated with case reports of liver failure (Australian Adverse Drug Reactions Advisory Committee, 2007). St. John's wort, widely used to manage depression, is an inducer of cytochrome P450 enzymes that biotransform both HIV protease inhibitors (PIs) (Piscitelli et al., 2000) and cyclosporine (Bauer et al., 2003). Concomitant use of St. John's wort and these medications has been associated with (a) reductions in PI plasma concentrations to subtherapeutic levels and the emergence of drug resistant strains of HIV, and (b) symptoms of kidney transplant rejection. Given the potential for life-threatening adverse events and drug interactions, it is essential that nurses assess their patients' use of dietary supplements and assist them to make informed decisions about their use.

Accordingly, we tailored our online case studies so that they depicted patients using CAM therapies that had potentially serious safety issues and/or were contraindicated with their current conventional treatment plans and developed pre- and posttest questions that measured students' ability to recognize and manage these safety issues. Our findings indicate that the case studies were effective in increasing students' knowledge on safety issues related to CAM therapies. Moreover, students perceived high levels of personal competence related to incorporating CAM knowledge into their clinical practice and to collaborating with CAM practitioners.

Our findings add to a growing body of literature that demonstrates the effectiveness of online case studies for health care education (Gerdprasert et al., 2010; Huckstadt & Hayes, 2005; Litchfield, Oakland, & Anderson, 2002; Nyamathi et al., 2010). Our study is the first to evaluate the effectiveness of online case-based modules for teaching graduate-level nursing students about clinical issues that surround their patients' use of CAM therapies. Students demonstrated increased CAM-related knowledge, especially as it relates to safety, after completing each online module. Nurse educators are encouraged to incorporate online case-based modules to their advanced practice curricula to increase students' knowledge and competence in caring for patients who use CAM therapies. Additional studies are needed to directly compare the effectiveness of online CAM education with classroom-based

education. Such studies are timely given the inclusion of CAM-related content in many advanced practice certification examinations.

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Table 1

AACN Master's Essentials Related to CAM

1	Develop and monitor comprehensive, holistic plans of care that address the health promotion and disease prevention needs of client populations.
2	Foster a multidisciplinary approach to discuss strategies and garner multifaceted resources to empower client populations in attaining and maintaining maximal functional wellness.
3	Develop a comprehensive data base, including complete functional assessment, health history, physical examination, and appropriate diagnostic testing.
4	Develop an effective and appropriate plan of care for the client which takes into consideration life circumstances and cultural, ethnic, and developmental variations.
5	Provide comprehensive and appropriate client education in relation to prescribed pharmacologic agents.

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Table 2**Case Study Format**

<p>Part I</p> <p><u>Case Study Information</u></p> <p>The presenting problem and the H & P</p> <p><u>Student Activity</u></p> <p>Students will consider how they will elicit information on CAM use.</p>	<p>Part II</p> <p><u>Case Study Information</u></p> <p>Information on CAM therapy</p> <p><u>Student Activity</u></p> <p>Students consider the putative physiological basis for the therapy and evaluate the level of evidence to support the therapy for the symptom.</p>
<p>Part III</p> <p><u>Case Study Information</u></p> <p>The patient will show an adverse effect or contraindication related to CAM use.</p> <p><u>Student Activity</u></p> <p>Students identify the adverse effect or contraindication and consider potential outcomes of continued use. They recommend a course of action.</p>	<p>Part IV</p> <p><u>Case Study Information</u></p> <p>The patient discontinues the CAM therapy, but still wants to incorporate a CAM approach into his/her lifestyle.</p> <p><u>Student Activity</u></p> <p>Students recommend an appropriate CAM therapy and discuss selection of a qualified CAM practitioner.</p>

Table 3

Evidence-Based Online CAM Resources

Natural Medicines Comprehensive Database www.naturaldatabase.com
University of Chicago Tang Center for Herbal Medicine Research http://tangcenter.uchicago.edu
National Center for Complementary and Alternative Medicine http://nccam.nih.gov
Memorial Sloan-Kettering Cancer Center http://www.mskcc.org/mskcc/html/11570.cfm

Table 4

Comparison of Pretest and Posttest Knowledge Scores

Module	N	μ Pretest Score (%)	μ Posttest Score (%)	t score	p value
Asthma	40	48.75	57.81	-3.33	.002
Depression	89	34.72	58.22	-7.53	<.0001
Empacho	39	82.82	95.39	-5.17	<.0001
Low Back Pain	148	77.50	95.50	-13.71	<.0001