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Abstract
The National Institutes of Health (NIH) recently opened a center for the study of the use of complementary and alternative medicine (CAM). While the NIH has conducted a few random sampling studies, none have examined the knowledge and use of CAM among undergraduates and whether these differ by gender. 111 college students were asked about the usage of a variety of CAM techniques, as well as about beliefs and opinions about CAM techniques. Several gender differences emerged. Implications for college wellness centers will be discussed.

Introduction
The impetus for this study began in a class given by the first author on Psychology of Health. As part of the course material, the class spends two weeks discussing the five types of complementary and alternative medicine recognized by the National Center for Complementary and Alternative Medicine (2004 – see description below). Students were very interested in these topics, but what was surprising was the number of students who reported using these techniques. Many students disclosed they had not told their physicians about their usage of these alternative and complementary techniques; many were not even sure why they were taking certain supplements – they just read something on the internet or their friends told them that they should take them to "feel better". As a result, it became clear that a research study on the usage of complementary and alternative practices needed to be conducted at the collegiate level – not only on student usage, but on student attitudes and beliefs about the effectiveness of these techniques. The study discussed here presents the initial findings of that study.

According to a 2004 nationwide study of the usage of complementary and alternative medicine (CAM), 62% of American adults used some form of complementary and alternative medicine during the past year (Barnes, Powell-Griner, McFann, & Nahin, 2004). Complementary and alternative medicine consists of the use and practice of therapies and diagnostic techniques that fall outside conventional Western biomedicine (Ibid) and is generally broken down into five broad groupings. Biologically-based practices consist of the use of vitamins, minerals, protein supplements, functional foods, and diets in order to improve health (National Center for Complementary and Alternative Medicine, 2004). Energy medicine includes the use of energy fields (e.g., light or sound) for the purpose of healing disease and promoting wellness. Manipulative and body-based practices include chiropractic and osteopathic manipulation, reflexology, massage therapy, and other bodywork techniques. Mind-body medicine focuses on the interactions among the brain, mind, body, and behavior (e.g., yoga, tai chi, guided imagery, and biofeedback). Finally, whole medical systems are complete, independent systems of theory and practice (e.g., traditional Chinese medicine, Ayurvedic medicine, homeopathy; Ibid).

The use of complementary alternative medicine is expanding in the United States, and with each year, Americans are spending increasing amounts of money on alternative and complementary therapies (Eisenberg, Davis, Ettner, Appel, Wilkey, Van Rompay, & Kessler, 1998). For example, in 2005, the Institute of Medicine of the National Academies (IOM) reported that 15 million American adults routinely used herbs and vitamins along with prescription medications to

treat illnesses. Because most health insurance policies do not cover these supplements, the annual out-of-pocket expenses were an estimated $27 billion dollars in 2004 (IOM, 2005). Why are Americans willing to spend such sums of money on these techniques, some of which are scientifically unproven? Twenty-eight percent of Americans began using complementary and alternative medicine because they believed conventional medicine could not help them, whereas 55% of Americans believe that the combination of alternative and complementary techniques along with conventional medicine would be more effective than conventional medicine alone (Barnes et al., 2004). In fact, 44% of Americans believe complementary and alternative medicine to be more effective than conventional medicine, and have eschewed conventional techniques in favor of CAM (Carlson & Krahn, 2006).

Complementary and alternative medicine usage does seem to vary by certain demographic characteristics. For example, alternative and complementary medicine usage is more prevalent among females than among males and complementary and alternative medicine usage is more prevalent in the Western part of the United States compared with other areas of the country (Carlson & Krahn, 2006; Goldstein et al., 2005). In addition, alternative and complementary medicine usage is greater among those with higher education levels, those who had been hospitalized in the past year, former smokers, and African-Americans (Barnes et al., 2004). Finally, Goldstein et al. (2005) found that those over 65 are the least likely to use alternative and complementary medicine. In addition, there are several racial and ethnic differences depending upon the specific modality in question.

The Present Study

Although a few nationwide studies have collected data about alternative and complementary medicine usage patterns and beliefs about complementary and alternative medicine, few studies have examined these patterns and beliefs among college students. As the usage of alternative and complementary medicine is more prevalent among those with higher levels of education (Barnes et al., 2004), it would seem prudent to examine usage patterns among undergraduate students. Additionally, because gender differences in complementary and alternative medicine usage patterns in American adults have been identified, it would also seem prudent to examine whether gender differences would emerge in college students' attitudes toward and usage patterns of alternative and complementary techniques.

Method

Participants

One hundred eleven college students (37 males, 74 females) at a large, public university in the Pacific Northwest responded to a survey in 2006 modeled after the one used in the 2004 National Center for Complementary and Alternative Medicine (NCCAM) study measuring the usage of a variety of complementary and alternative medicine techniques, as well as examining student beliefs and opinions about these techniques. Before beginning the study, the university subcommittee for the protection of research subjects approved procedures for this investigation.

Measures

The authors created a three-section survey based on the nationwide survey administered by NCCAM in 2004. The first section included basic demographic questions (e.g., grade, GPA, gender, and ethnicity). This was followed by a 40-item section asking students about their attitudes and beliefs about alternative and complementary techniques (e.g., Do you feel that most complementary and alternative medicine/practices/diets/exercises are generally safe? Does your confidence in effectiveness lie more towards conventional medical treatments than complementary and alternative medicine/practices/diets/exercises?). The final section consisted of 12 questions about the participants' usage of various these modalities during the past 12 months. In addition, students were asked for what illness/problem they have used alternative or complementary medicine and how they had heard about the technique they were using.

Results

Gender Differences in Beliefs about Complementary and Alternative Medicine

The results of the study revealed a trend for men to rate their health status more positively than for women, with a chi-square value of 5.25, with a p value of less than .10. Furthermore, a few gender differences in complementary and alternative medicine beliefs emerged in the findings. For example, women were more likely than men to say that their family members/relatives/friends used alternative and complementary medicine , with a chi-square value of 7.88 and a p value of less than .05; that they viewed complementary and alternative medicine as credible, with a chi-square value of 5.37and a p value of less than .10; that people have different opinions/ideas/views as to what "healthy" concerns/means?, with a chi-square value of 5.37 and a p value of less than .10; that health care today seems very industrialized/ bureaucratic, with a chi square value of 4.81 and a p value less than .10; that strong evidence supports the use of alternative and complementary techniques, with a chi-square value of 16.84, and a p value of less than .001, and that complementary and alternative medicine has altered their health beliefs, with a chi-square value of 12.81, and a p value of less than .01. Men were more likely than women to say that conventional medical treatments were more worthwhile than alternative and complementary techniques, with a chi-square value of 9.82, and a p value of less than .01. Men also rated their health status more positively than women, with a chi-square value of 5.25, and a p value of less than .10.

Gender Differences in Complementary and Alternative Medicine Usage

Participating students were provided with lists of various complementary and alternative medicine therapies and were asked to indicate whether they had used those therapies before. The researchers then ranked the top three alternative and complementary medicine therapies in each category by gender preference to ascertain whether there were gender differences in usage patterns. A few differences emerged. When asked why they had seen a alternative or complementary medicine practitioner, the top three responses for women were vitamin therapy (73% of female students), massage therapy (57%), and exercise therapy or prayer (tied at 53%). Men reported that they had seen a practitioner for vitamins (54%), exercise therapy (49%), and massage therapy (46%). When asked what herbs they had used in the past 12 months, the top three reported for women were aloe vera (59%), Echinacea (41%), and cranberry (32%). The top three reported herbs for men were aloe vera (37%), and cranberry and ginseng (tied at 30%). When asked if they had used special diets in the past 12 months, the top three choices for female students were "self-prescribed plans" (11%), vegetarian diets (8%), and the Zone diet (5%). For men, they were Atkins, South Beach, and "self-prescribed plans" (tied at 8%). When asked about vitamin usage in the past 12 months, the top three vitamin supplements used by female students were multivitamins (87%), calcium (51%), and Vitamin C (46%); for men, they were multivitamins (65%), Vitamin C (54%), and calcium (35%). When asked about usage of essential oils over the past 12 months, there was a three-way tie (16% each) between lavender, lemon, and tea tree oil for women; there was a three-way tie (8%) between lemon, orange, and tea tree oil for men. When asked about their usage of crystals over the past 12 months, men reported no crystal usage. Women, on the other hand, reported a small amount, with 3% of female students using tiger's eye, and a three-way tie (1% each) between clear quartz, lapis lazuli, and rose quartz. When asked how they heard about the complementary and alternative medicine techniques they were using, the top three answers for female students were family/friend (76%), magazines (49%), and the Internet (45%). For men, the top three answers were family/friends (68%), television (57%), and books (49%). When asked what specific health problems they used alternative and complementary medicine for, the top three answers for women were back pain (42%), arthritis/fibromyalgia (34%), and stress (31%). For men, the top three answers were back pain (27%), neck pain (16%), and anxiety (14%).

When asked why they chose to use complementary and alternative medicine, the top three answers given by women were to promote overall wellness (73%), to simply stay healthy/maintain some balance in [my] health (45%), and to prevent future illness/disease/ailment (41%). For men, the top three answers were to promote overall wellness (41%), they thought it would be interesting to try (30%), and to simply enhance productivity, energy, function, etc. (30%).

Discussion

Previous research has examined complementary and alternative medicine usage and beliefs about it in nationwide studies of American adults. The purpose of this study was to investigate complementary and alternative medicine usage and beliefs about it among college students.

Similar to Carlson and Krahn (2006), Goldstein et al. (2005), and Nedrow et al. (2007), we found gender differences both in beliefs about complementary and alternative medicine and in its usage. In general, women exhibited much more positive views about complementary and alternative medicine, and knew more friends and family members who had used alternative and complementary techniques. On the other hand, men were more likely to report that conventional medicine was more worthwhile than complementary and alternative medicine. The usage patterns of the various alternative and complementary modalities reflected these beliefs. For example, when asked what type of treatment they had sought from a complementary and alternative medicine practitioner, both men and women cited vitamin supplement therapy as their most frequent usage of alternative and complementary medicine; however, 73% of female students had used vitamin therapy in the past year, whereas only 54% of men had. Although women were more likely than men to use complementary and alternative medicine therapies overall, there were some notable differences in the types of therapies used. For example, women were more likely to use prayer and crystals than men were, whereas men were more likely to use ginseng supplements. Men and women also differed in their usage of various diets, with women using the Zone diet more than men did, and more men using the Atkins and South Beach diets than women. Finally, women and men differed in their usage of essential oils, with women being more likely to use lavender oil, and men more likely to use orange oil.

Limitations

Certain limitations to this study must be addressed. The study had a rather small sample size (one hundred eleven), and thus may not give an accurate representation of all college students. Second, our study was conducted at a single university in the United States with only undergraduate students participating. Results may differ at other universities. Third, the vast majority of our participants were Caucasian (81%), making it difficult to generalize results to students of other racial backgrounds. Finally, usage of complementary and alternative medicine may change over time as students' health changes, which may also impact their attitudes toward alternative and complementary medicine and its various modalities. Thus, future studies might wish to conduct a longitudinal assessment of complementary and alternative medicine usage patterns and student beliefs about its effectiveness.

Conclusion

As mentioned previously, anecdotal evidence from the first author's class culminated in a research study of the usage, attitudes, and beliefs about alternative and complementary therapies. The results were not surprising. As expected, it is clear that college students are using complementary and alternative medicine, and that women are more likely than men are to utilize these techniques at the collegiate level. College health and wellness centers may wish to ask students about their usage of complementary and alternative medicine when they come in for their appointments, as some therapies (e.g., vitamin or herbal supplements) may interact with medications prescribed by health and wellness center physicians. According to the National Center for Complementary and Alternative Medicine (NCCAM, 2004) website, "Many people assume dietary supplements to be inert or at least innocuous. Yet, recent studies show clearly that interactions between these products and drugs do occur. For example, the active ingredients in ginkgo extract are reported to have antioxidant properties and to inhibit platelet aggregation. Several cases have been reported of increased bleeding with ginkgo's use with drugs that have anticoagulant or antiplatelet effects. St. John's

wort induces a broad range of enzymes that metabolize drugs and transport them out of the body. It has been shown to interact with a number of drugs that serve as substrates for the cytochrome P450CYP3A enzymes responsible for metabolism of approximately 60 percent of current pharmaceutical agents. Other dietary supplements shown to potentiate or interfere with prescription drubs include garlic, glucosamine, ginsing (Panax), saw palmetto, soy, valerian and yohimbe."

Given that students are using complementary and alternative modalities, it would be in the best interest of college health educators to enlighten students about the safety and effectiveness of various techniques such as putative energy fields (e.g. Reiki, Johrel, Qi gong, Healing Touch) which have to date defied measurement by reproducible methods (NCCAM, 2004), to ensure that their students remain healthy. In fact, Pettersen and Olsen (2007) suggest stronger emphasis on teaching about philosophies of complementary and alternative medicine in the health sciences. Similarly, instructors of courses such as Psychology of Health, Health Promotion, Nutrition, etc. may also wish to add a section about complementary and alternative medicine to their lecture series. Because students are making use of modalities they may not fully understand or modalities that may not be effective or safe to use, continuing in the trend of incorporating complimentary and alternative medicine in course work will prepare students in their field, as well as provide them necessary education to ensure their own wellness (c.f. Nedrow et al., 2007). It is clearly the duty of health educators to recognize the widespread use of alternative and complementary medicine and the need for a better understanding of the effects of these treatments from the health perspective (National Academy of Science, www.nap.edu.)

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