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RESEARCH ARTICLES

Comparison of Attitudes, Beliefs, and Resource-seeking Behavior for CAM Among First- and Third-Year Czech Pharmacy Students

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Objectives. To assess and compare first- and third-year Czech pharmacy students' attitudes toward CAM, CAM use, CAM evidence, recommending CAM to patients, and including CAM in the pharmacy curricula.

Methods. The CAM Health Belief Questionnaire (CHBQ) was translated from English to Czech and administered to 250 first-year and 187 third-year students.

Results. The students' mean CHBQ score was 48.5, affirming positive attitudes toward CAM. Vitamins, herbs, massage, and relaxation were the most commonly used therapies among students. Czech students reported significantly low use of evidence-based resources on CAM. Ninety percent of the pharmacy students surveyed would recommend CAM and 89% believed pharmacists should be knowledgeable of CAM. Ninety-one percent of first-year vs 78% of third-year students supported CAM education ($p = 0.01$).

Conclusions. Czech students have positive attitudes about CAM, but are less likely to access evidence-based information. They agree pharmacists should be educated about CAM.

Keywords: attitudes, complementary and alternative medicine (CAM), curriculum, survey

INTRODUCTION

Complementary and alternative medicine (CAM), defined as those therapies not taught in allopathic schools, has been widely used throughout the world.[1] The most recent 2002 US National Health Interview Survey showed that more than one third of adults had used some form of CAM therapy in the previous 12 months. The number reached 62% when prayer was included.[2] In Europe, complementary therapies are used by 20%-50% of the population.[3] In the Czech Republic, a thorough survey on CAM use by an overall population has not yet been reported. One limited study (500 survey respondents) found that 68% of Czechs had used at least 1 of 5 CAM therapies (acupuncture, homeopathy, herbs, dietetic treatment, and natural healing) sometime in the past and 36% had used at least 1 during the previous 12 months.[4] The Czech Republic was also cited as the country with the highest use of CAM with nearly three-quarters of Czech cancer patients using at least one CAM therapy.[5]

An adequate education in CAM would improve healthcare providers' ability to assist patients in making informed decisions and in presenting current evidence on the safety and cost-effectiveness of CAM therapies. In the United States, the need to implement CAM education in health profession education has been well recognized.[6] Sixty-four percent of US medical schools and 73% of US pharmacy schools offer CAM courses as part of their curriculum.[7,8] In Europe, CAM-related courses are a part of the regular curriculum in 40% of medical departments and 72% of health sciences departments, respectively.[9,10] However, most CAM courses are elective and mostly focused on only 1 CAM therapy.[8] In the Czech Republic, there are 2 pharmacy schools, both of which currently offer elective courses on homeopathy and herbal remedies to pharmacy students. More comprehensive courses on different CAM modalities and an integrated approach that includes CAM in existing training courses are still needed.

To date, no data on pharmacy students' attitudes toward CAM have been published for the Czech Republic (population = 10 million). To address this deficit, we conducted a survey of Czech pharmacy students in 1 of 2 Czech pharmacy schools. The primary goal was to determine Czech pharmacy students' attitudes toward CAM, CAM use, CAM information-seeking behavior, likelihood to recommend CAM therapy to a patient, self-reported knowledge of CAM therapies, interest in

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CAM education, and perception of the importance of CAM in pharmacy practice. The second goal of the study was to compare CAM attitudes, CAM use, and CAM information-seeking behavior of first-year Czech pharmacy students to that of their third-year class peers.

METHODS

Czech students are accepted into a 5-year pharmacy program after completing high school at an average age of 18 to 19 years. The pharmacy curriculum consists of basic science (770 hrs) and clinical pharmacy education (1418-1950 hrs), completed over 5 years.

Two hundred seventy-eight first- and third-year pharmacy students at the School of Pharmacy at the Charles University in Prague were asked to participate in an anonymous survey. There were 250 and 187 pharmacy students enrolled into the first and third academic year of the 5-year pharmacy program in 2005, respectively. This was a cross-sectional study using a self-administered survey instrument. The study was approved by the Ethical Committee of School of Pharmacy.

The validated 10-item CAM Health Belief Questionnaire (CHBQ) using a 7-point Likert scale was designed to measure attitudes/beliefs toward CAM use and practice in general health care and academic settings.[11,12] As the original questionnaire was developed for a US English-speaking study population, the CHBQ questionnaire was translated and back translated, then piloted with a small sample of Czech pharmacy students since Czech curricula are delivered in the Czech language. Because the maximum score on the CHBQ is 70, a positive attitude toward CAM was predefined as a total mean score exceeding the midpoint neutral score of 35, the same criterion used in the paper validating the CHBQ.[11]

The CHBQ was administered to the first- and third-year classes during the first 6 weeks of fall 2005. All students were asked to voluntarily complete the questionnaire prior to a mandatory pharmacy group lecture unrelated to CAM. They were given 20 minutes to complete the questionnaire.

Data on demographics, CAM attitudes (the CHBQ), CAM use, and CAM information-seeking behavior were collected using a self-administered questionnaire. The list of CAM modalities was adapted to the Czech setting. *Curanderismo* was excluded and natural healing, aromatherapy, ethicotherapy, relaxation, guided imagery, and reflexology therapy were added to the list of modalities for respondents to select. (Ethicotherapy is a conscious mental process that induces and integrates moral principles and was founded by a Czech physician, Ctibor Bezdek, MD, in 1930.)

Additionally, we asked the Czech students about their likelihood of recommending any CAM therapy to a patient (Would you recommend a CAM therapy for any condition to a patient? a. yes, b. no), their self-reported knowledge about a listed CAM therapy in order to advise patients (Would you be able to advise a patient on a CAM therapy? a. yes b. no), their interest to study CAM (Would you be interested in learning about CAM in an introductory course on Integrative Medicine? a. yes, b. no), its preferred format (What form of CAM course would you prefer? a. mandatory, b. elective), perceived benefit (Do you perceive the course on CAM as a. beneficial, b. necessary, c. useless?) and importance of CAM education in the pharmacy practice (Do you think that a pharmacist should be knowledgeable about different CAM therapies and its use? a. yes b. no).

Descriptive statistics were used (proportions, mean, standard deviations) to analyze students' responses to each question. First- and third-year student responses were analyzed in aggregate and also compared. The mean score for the CHBQ was calculated for all as well as each of the items. Categorical data between the groups were analyzed by chi-square test or the Fisher exact test (two-tailed). An independent *t* test or Mann-Whitney test was used for continuous variables, depending on the distribution. A general linear model (GLM) analysis was used to investigate the main effects of the following variables as well as their interactions on students' beliefs/attitudes toward CAM (CAM use, CAM self-reported knowledge, likelihood to recommend CAM, CAM information source use). P values <0.05 were considered significant. All analyses were performed using SPSS version 12.0 (SPSS Inc, Chicago, Ill, 2006).

RESULTS

One hundred thirteen first-year students and 165 third-year students participated in the study. The respondents' characteristics are shown in Table 1.

The CHBQ overall mean score for the first- and third-year classes were 48.9 ± 9.0 (range: 24-69) and 48.3 ± 8.2 (range: 27-70), respectively, confirming positive beliefs/attitudes toward CAM in both classes of pharmacy students (Table 2). There were 50% of items with mean scores ≥ 5.0, indicating a strong agreement in both classes. In contrast to first-year students, third-year students agreed more strongly that patient's expectations, health beliefs, and values should be integrated into the patient care process ($p = 0.047$).

Across the 2 classes, 92% of all students reported the use of at least 1 CAM modality (excluding vitamin/mineral supplements); 17% used just 1 modality, and 74% used 2 or more modalities. Medicinal herbs (79.5%), massage (61.2%), and relaxation techniques (56.5%) were the most commonly used therapies. Vitamin and mineral

Table 1. Characteristics of Czech Pharmacy Students Who Participated in a Survey of CAM Use and Attitudes

	First-Year Class, n = 113	Third-Year Class, N = 165	Overall, N = 278	*P*[a]
Response rate, %	43	88	64	
Age (years)				
Mean (SD)	19.8 (1.9)	21.7 (1.6)	20.9 (1.9)	0.001
Median	19	21	21	
Female, No. (%)	105 (92.9)	130 (78.8)	235 (85)	0.001
Place of residency, No. (%)				
Rural	65 (58)	89 (54)	154 (55)	NS
Urban	48 (42)	76 (46)	124 (45)	NS

[a]An independent t test or Mann-Whitney test were used for continuous variables and chi-square test or Fisher exact test (two-tailed) for categorical variables depending on normal distribution at a level of significance <0.05

supplements were used by 82% of students. There were no interclass differences in the pattern and mean number of CAM modalities used (Table 3).

The awareness use of CAM information sources was higher in third-year than in first-year students. Students obtained information on CAM mainly through the Internet (44.2% vs 58.8% for third and first years, respectively; $p = 0.01$), journals (43.4% vs 58.2%; $p = 0.01$), and books (38.1% vs 47.3%; p = 0.08). Only 10% of respondents relied on other sources of information such as television, radio, lectures on CAM, and marketing materials. Few students reported seeking information on CAM from their friends, physicians, or natural healers.

Generally, both classes showed low awareness and use of CAM evidence-based information sources. PubMed was the only CAM evidence-based information source that was identified (first-year class: 5.3% vs third-year class: 45%; $p < 0.001$) and used among students (first-year class: 1.8% vs third-year class: 29.7%; $p < 0.001$).

Table 2. Responses of First- and Third-Year Czech Pharmacy Students on a CAM Health Belief Questionnaire

	Mean (SD)		
CHBQ Items	**First-Year Class, n = 113**	**Third-Year Class, n = 165**	**Overall n = 278**
1. The physical and mental health are maintained by an underlying energy or vital force.	5.2 (1.6)	4.9 (1.5)	5.0 (1.5)
2. Health and disease are a reflection of balance between positive life-enhancing forces and negative destructive forces.	4.5 (1.6)	4.3 (1.6)	4.4 (1.6)
3. The body is essentially self-healing and the task of a health care provider is to assist in the healing process.	4.7 (1.6)	4.6 (1.6)	4.7 (1.6)
4. A patient's symptoms should be regarded as a manifestation of general imbalance or dysfunction affecting the whole body.	4.4 (1.7)	4.7 (1.8)	4.6 (1.7)
5. A patient's expectations, health beliefs and values should be integrated into the patient care process.	4.8 (1.6)	5.2 (1.4)[b]	5.0 (1.5)
6. Complementary therapies are a threat to public health.[a]	5.5 (1.7)	5.5 (1.5)	5.5 (1.6)
7. Treatments not tested in a scientifically recognized manner should be discouraged.[a]	4.7 (1.8)	4.4 (1.8)	4.6 (1.8)
8. Effects of complementary therapies are usually the results of a placebo effect.[a]	4.1 (1.5)	3.9 (1.6)	4.0 (1.5)
9. Complementary therapies include ideas and methods from which conventional medicine could benefit.	5.7 (1.4)	5.6 (1.3)	5.7 (1.3)
10. Most complementary therapies stimulate the body's natural therapeutic powers.	5.2 (1.4)	5.1 (1.2)	5.1 (1.3)
Total mean score	48.9 (9.0)	48.3 (8.2)	48.5 (8.5)

[a]Item response were reverse scored so a higher value indicated greater endorsement

[b]An independent *t* test or Mann-Whitney test were used depending on normal distribution to test for differences between classes at a level of significance <0.05

Responses were based on a Likert-type scale ranging from 1 = absolutely disagree and 7 = absolutely agree

Table 3. Complementary and Alternative Medicine Use, Self-Reported Knowledge, and Likelihood of Recommending CAM Modality Among Czech Pharmacy Students

	Used, %		Self-reported Knowledge, %		Likely to Recommend to a Patient, %	
CAM Modality[a]	First-Year Class, (n = 113)	Third-Year Class, (n = 165)	First-Year Class, (n = 113)	Third-Year Class, (n = 165)	First-Year Class, (n = 113)	Third-Year Class, (n = 165)
Any CAM modality	91	93	92	93	94	93
Vitamins	80	84	81	89	77	79
Herbals	77	81	83	86	75	81
Massage	64	59	80	84	81	72
Relaxation	62	53	73	79	72	66
Homeopathy	34	39	62	71	37	41
Aromatherapy	42	33	67	62	48	38
Yoga	31	33	68	70	56	60
Meditation	24	16	69	70	49	42
Spirituality	20	16	42	42	17	18
Natural healing	12	15	56[b]	43[b]	18	16

[a]Only the 10 most frequently used therapies are listed

[b]An independent *t* test or Mann-Whitney test were used depending on normal distribution to test for differences between classes at a level of significance <0.05

Ninety-three percent of the respondents would recommend at least 1 CAM modality to a patient for any condition (Table 3). The most likely recommended CAM modalities were herbs (78%), vitamins (78%), massage (75%), relaxation (68%), and yoga (58%). Out of 23 listed CAM modalities, students indicated they would recommend an average of 4.9 CAM therapies to a patient for for a condition and would be able to provide a patient with CAM-related information on an average of 7.7 CAM modalities. No statistical difference was found between the 2 classes in the mean number and type of recommended or known CAM modalities used.

More than two thirds of all students (231/278; 83.1%) expressed an interest in participating in an integrative medicine course. However, there was a significant difference between the 2 groups. The first-year students were more interested in signing up for an integrative medicine course than the third-year students (103/113, 91.2% vs 128/165, 77.6%; $p < 0.01$). The majority of students preferred an elective course (263/278, 94.6%). Yet, fewer third-year students preferred an elective over a mandatory option (112/113, 99.1% vs 151/165, 91.5%; $p < 0.01$). Also, more first-year than third-year students regarded an introductory class on integrative medicine as beneficial ($p < 0.01$). Eighty-nine percent of all respondents agreed that a pharmacist should be knowledgeable about the nature and use of different CAM modalities.

Higher personal use of CAM modalities was significantly associated with positive attitudes toward CAM (GLM $p < 0.001$). Students with more positive attitudes toward CAM also used more information sources to research CAM (GLM $p < 0.001$), were more likely to recommend a CAM modality to a patient for a condition (GLM $p < 0.001$), and were more likely to provide a patient with CAM modality information (GLM $p = 0.04$).

DISCUSSION

A cross-sectional survey showed that both first- and third-year Czech pharmacy students had positive attitudes toward CAM. The use of at least one CAM modality was high among both classes and included vitamins, herbals, massage, and relaxation techniques. The Internet, journals, and books were the main resources students consulted for information on CAM. Pharmacy students showed low awareness and use of evidence-based CAM information sources. Despite this, more than 90% of all Czech students would recommend a CAM modality to a patient for a medical condition. They would recommend a CAM therapy with which they had the most experience and were most familiar such as herbals, vitamins, massages, and relaxation techniques. The mean number of CAM therapies students would recommend was 5 of the 23 listed CAM modalities listed and students reported having knowledge of 8 of the 23 listed CAM modalities. This finding, that pharmacy students' self-reported willingness to recommend CAM therapies to patients despite a lack of knowledge based on current evidence, should be of concern to educators and health profession practitioners. Similar results were found in a study by Harris. Positive attitudes toward CAM were reported in the majority of surveyed US pharmacy students at University of Minnesota. Most students perceived a lack of training in

CAM as a barrier to CAM use. Almost all students expressed the importance of being knowledgeable and trained in CAM in order to advise patients.[13]

Positive attitudes toward CAM have also been described in pharmacy students in other countries[14,15] and among undergraduate students across different health care professions.[11,12,16,17] In a study by Lie et al, first- and second-year US medical students' attitudes toward CAM, CAM use, and CAM information-seeking behavior at the University of California-Irvine were previously reported using the same methodology.[11] Despite the differences in age, gender, and ethnic distribution, Czech pharmacy students share the same positive attitudes toward CAM as US medical students. The frequency of use of at least 1 CAM modality was higher in Czech pharmacy students compared to US medical students (CZ: 90% vs US: 74%) which may be explained by a higher proportion of women in our study due to the overall greater proportion of women enrolled in pharmacy schools in the Czech Republic (CZ: 85% vs US: 48%).

The finding that female gender is positively associated with CAM use has been previously reported.[2] The frequency of self-reported CAM use did not differ between the Czech and the US first- and third-year students. There were some CAM modalities that were more frequently used by CZ pharmacy students than by US medical students such as medicinal herbs, massages, and homeopathy. On the other hand, US medical students reported higher use of other CAM modalities such as meditation, spirituality, ayurveda, hypnosis, and chiropractic care. We speculate that the greater ethnic diversity of US medical students may have contributed to the different pattern of CAM use. Also, Czech pharmacy students were more likely to use herbs than US medical students. This may be due to the local traditional use of herbs that is rooted in Czech folk medicine. There was strikingly lower awareness and use of online information sources in Czech pharmacy students vs US medical students, as compared with other sources such as books and journals (Internet, US: 81% vs CZ: 52.9%; PubMed US: 91.5% vs CZ: 18.3%; and health databases, US: 28.3% vs CZ: 8.3%). This may be due to the lack of access to the Internet among Czech students, lack of prior CAM education in high school, and Czech students not yet having been introduced to online information sources as part of pharmacy informatics teaching at the time of the survey, as US medical students had been.

The strengths of our study are the completeness of the data, use of a validated survey instrument, and a high representative sample of Czech pharmacy students. Weaknesses include the use of a translated instrument to measure attitudes toward CAM. Nevertheless, we did validate the translation of CHBQ to the Czech language as well as its understandability by Czech pharmacy students, and thus do not expect the translation of the instrument to have a large impact on the results.

The pattern of CAM use among patients should be further investigated in the Czech Republic in order to understand Czech patient's needs and to develop a relevant CAM curricula for Czech pharmacy students. In addition, the ability of pharmacy faculty members to teach about CAM and their own attitudes and use of CAM modalities should be explored to determine who should teach this to pharmacy students and how new curriculum in CAM could best be developed to meet the need for more evidence-based instructions. We found that a high proportion of surveyed Czech pharmacy students were interested in learning about CAM in a more systematic fashion and held a belief that a pharmacist should be knowledgeable about the nature and use of different CAM modalities. This is of even greater importance given that many respondents reported that they were willing to recommend an average of 5 CAM modalities without the requisite evidence to do so, that is, based only on personal use of these modalities. The older class preferred an elective over a mandatory CAM course and perceived CAM instruction as less beneficial compared to their younger peers. In a study by Furnham et al, a similar trend was observed with medical students who became more skeptical about CAM as their medical training progressed.[18] Also, a study by Evans et al showed that a required introductory course addressing CAM changed student's likelihood to recommend various CAM therapies.[19]

CONCLUSIONS

Our study affirmed positive attitudes among first- and third-year pharmacy students toward CAM use and recommendation to patients, and the need for more evidence-based instruction in pharmacy education. Future studies will be directed toward selecting CAM curricula that best address the needs of Czech pharmacy trainees, comparing these trainees to Czech medical students, and development of appropriate CAM curricula for pharmacy education to meet the needs of Czech patients.

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