

## RESEARCH

### **Pakistani Pharmacy Students' Perception About Complementary and Alternative Medicine**

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**Objectives.** To assess Pakistani pharmacy students' perceptions of complementary and alternative medicine (CAM), the frequency with which they use CAM, and barriers to use of CAM.

**Method.** A CAM health belief questionnaire was administered to 595 students enrolled in a 5-year doctor of pharmacy program (PharmD) in Pakistan.

**Results.** Attitudes of students towards CAM were positive. Lack of evidence supporting CAM practices was considered to be the major barrier toward more students using CAM. A majority of students (79%) agreed that clinical care should integrate conventional medicine and CAM practices. Many CAM-based therapies, such as dietary supplements, massage, herbal medicines, and homoeopathic medicines were used by the students. Significant gender differences in attitude were observed, with male students having more conservative attitudes toward CAM use. A high percentage of students desired more training in CAM.

**Conclusions.** Pakistani students exhibited positive attitudes about the value of CAM and most felt that CAM should be included in the PharmD curriculum.

**Keywords:** pharmacy students, complementary and alternative medicine, perception, attitudes, Pakistan

## INTRODUCTION

There has been a significant increase in the use of CAM worldwide.<sup>1-4</sup> CAM is used by more than 50% of the world's population, and evidence concerning the benefits of CAM, as well as possible adverse effects, has been accumulating.<sup>5</sup> Primary care providers and pharmacists are among the most trusted healthcare professionals, and both are accessible to patients. In most countries, pharmacists are at the forefront of patient interactions and provide information and guidance to patients about safe and effective use of all medicines. However, pharmacists generally rate their knowledge of CAM as being inadequate and they are not confident in answering many patient inquiries.<sup>6,7</sup> A survey among Australian community pharmacists found that 57% felt that their training was not sufficient regarding CAM knowledge. They relied heavily on manufacturers' information about CAM, and their lack

of suitable training was one of the perceived barriers to providing information about CAM to patients.<sup>8</sup>

Studies have been undertaken in several countries to determine the knowledge and attitudes of medical, pharmacy, and nursing school students, staff members, and faculty members concerning CAM.<sup>9-13</sup> The majority of medical and pharmacy students surveyed welcomed the inclusion of CAM education in the curricula; nursing students were less enthusiastic.<sup>6,14-17</sup>

The increased use of CAM worldwide requires that consideration be given to the integration of CAM into health professions education. However, incorporation of CAM into health professions curricula is handled differently by institutions and countries. Furthermore, evaluation of CAM curricula is complicated, because students' ability to learn about CAM may be influenced by factors such as their prior knowledge and experience with CAM and the perceptions and attitudes of clinical preceptors. Medical educators should continue exploring medical students' attitude changes towards CAM.<sup>18</sup> In the United States, CAM education has improved in colleges and schools of

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pharmacy: approximately 70% to 85% of pharmacy colleges and schools now offer some type of CAM instruction in the curriculum. However, the content is primarily in the form of elective courses that tend to focus on natural products rather than the full range of CAM-related practices.<sup>19,20</sup>

In Pakistan, research into the use of CAM is based on small-scale studies that focus on prevalence of use among medical students, cancer patients, and other special patient populations.<sup>21-24</sup> Patterns of CAM use by immigrant Pakistanis in the United Kingdom have also been studied, but no comprehensive work has assessed the perception of pharmacists about CAM use.<sup>25</sup> The present study was undertaken to assess the frequency of use, attitudes, perceptions, and circumstances of use among pharmacy students of Hamdard University, Islamabad Campus, Pakistan, regarding CAM.

## METHODS

The present study was conducted from January to April 2010. At Hamdard University students are accepted into the 5-year PharmD program after completing 12 years of education. (This PharmD program is approved by the Higher Education Commission, Government of Pakistan, and differs from the longer program found in the United States). Average age of students at the time of entry is 18 to 19 years. At the time of the survey, 595 students (291 males and 304 females) were enrolled in the PharmD program. The program did not include training in CAM. The survey tool was approved by the ethics committee of Hamdard University.

An initial draft of a CAM health belief questionnaire was prepared and tested with 25 students. After revision, the questionnaire was distributed to a larger number of students. Results of the pretesting were not included in the final analysis of the data.

The final questionnaire was divided into 4 sections. The first section contained sociodemographic information including age, gender, religion, place of residency, availability of a family physician, and difficulty in accessing a physician. The second section assessed the frequency at which various categories of CAM were encountered by the students. The third section was comprised of questions assessing the attitudes of students toward CAM and barriers to CAM use. The fourth section included questions assessing the source of information about CAM. The questionnaire was distributed and collected by elected class representatives.

Data from questionnaires that were filled out completely were coded and entered into SPSS, version 17 (SPSS, Inc., Chicago). To summarize the data, descriptive statistics were used. All Likert-scale responses with any degree of agreement were grouped together as positive

responses, and all responses with any degree of disagreement were grouped together as negative responses. T tests and chi-square tests were used to analyze differences between male and female students. Differences were considered to be significant if the *p* value was less than 0.05 (the alpha was set at 0.05).

## RESULTS

The survey response rate was 70% (418/595) for all students in the PharmD program, with a significant difference in the percentage of male 66% (278/422) and female respondents 81% (140/173) (*p* > 0.001). Among the 418 respondents, 107 (26%), 39 (9%), 105 (25%), 91 (22%), and 76 (18%) were studying in first, second, third, fourth, and final years of the program, respectively. Demographic characteristics of the survey tool are summarized in Table 1. Age ranges were from 18 to 25 years. Out of 418 students, 369 (88%) lived in urban areas, while the remaining 49 (12%) lived in rural areas (*p* > 0.001). A vast majority of the respondents (400 or 96%) were Muslims, while 18 (4%) were Christians (*p* > 0.001). All were

Table 1. Demographic Characteristic of Pakistani Pharmacy Students Who Participated in a Survey Regarding Complementary and Alternative Medicine

Characteristic	Distribution	<i>P</i> <sup>a</sup>
Response rate, No. (%)	418/595 (70)	
Male	278/422 (66)	
Female	140/173 (81)	0.001
Age in years		
Range	18-25	
Mean age	20.63 (± 1.782)	
Religion, No. (%)		
Muslim	400 (96)	
Christian	18 (4)	0.001
Place of residency, No. (%)		
Urban	369 (88)	
Rural	49 (12)	0.001
Have a family physician, No. (%)		
Yes	322 (77)	
No	96 (23)	0.001
Physician's location, No. (%)		
Urban	380 (91)	
Rural	38 (9)	0.001
Difficulty in accessing physician, No. (%)		
Yes	121 (29)	
No	297 (71)	0.001

<sup>a</sup> Difference between the 2 variables given for each characteristic.

born in Pakistan. Three hundred twenty-two (77%) students had a family physician, while 96 (23%) did not ( $p > 0.001$ ). One hundred twenty-one (29%) students had difficulty gaining access to their physician, while 297 (71%) did not ( $p > 0.001$ ).

A variety of CAM practices were covered by questions in the survey instrument (Table 2). The most commonly used CAM among students were: massage therapy (347, 83%), dietary supplements (259, 62%), homeopathic medicine (245, 59%), and herbal/unani medicines (243, 58%). (Unani is Greek-Arabic medicine primarily based on the methods from ancient Iona and Greece). Among the commonly used types of CAM, significant differences were observed between male and female students (Table 2). Among the least used types of CAM were acupuncture (5, 1%) and Reiki (1, 0.24%); (Reiki is a form of therapy that uses simple hands-on, no-touch, and visualization techniques, with the goal of improving the flow of life energy in a person). No use of reflexology was recorded for the preceding year (Table 2).

A minority of the students (15%) agreed that CAM should be included in their school's curriculum even though a vast majority (69%) considered knowledge about CAM to be important to pharmacists (Table 3). There was a split among the students regarding the actual benefits of CAM: 251 (60%) felt that CAM methods provide real relief of symptoms, while 198 (47%) considered CAM methods to have only placebo effects. The majority of students (394, 95%) agreed that the public should be discouraged from using CAM practices that had not been tested according to scientific methods. About 25% (103) of the respondents considered CAM to be a threat to public health. In general, the majority of students felt CAM methods should be integrated into patient care, thought that CAM included ideas and methods from

which conventional medicine could benefit, and believed that a number of CAM approaches held promise for the treatment of diseases. The students agreed that health professionals should be able to advise their patients about commonly used CAM methods. There was a significant difference in male and female students' opinions regarding the placebo effects of CAM, whether CAM can actually treat symptoms and diseases, and whether CAM ideas and methods from which conventional medicines may benefit should be included in the pharmacy curriculum and in pharmacy practice (Table 3).

As summarized in Table 4, the most important perceived barrier to CAM use was lack of evidence supporting CAM concepts (298, 71%). Also important was concern for the legality of using CAM methods (274, 65.5%). Other important barriers were lack of staff members trained in CAM methods (246, 59%) and lack of appropriate equipment needed to perform CAM therapies (194, 46%). Prolonged treatment time was considered to be an important barrier to CAM use by only a small number of students (53, 8%). There were significant differences between male and female students' responses to all the statements (Table 4).

The majority of students (>66%) were in favor of using CAM under a variety of conditions (Table 5), including for most medical problems (316, 76%). Significant differences in the percentages of male and female students who agreed CAM use was acceptable for each of the following: conditions for which there is no known cure (60% vs. 80%), for disease prevention (81% vs. 37%), and in conjunction with conventional therapy (85% vs. 39%).

A variety of sources of information about CAM practices were consulted by students (Table 6). A majority of students obtained information through relevant professional journals (268, 64%), followed by the Internet (203, 49%) and from other healthcare professionals (172, 41%).

Table 2. Pakistani Pharmacy Students' Use of Complementary and Alternative Medicine in the Preceding Year

Type	Total, No. (%), n = 418	Male, No. (%), n = 278	Female, No. (%), n = 140
Acupuncture	5 (1.2)	5 (1.8)	0
Aromatherapy	18 (4.3)	18 (6.5)	0
Ayurveda	0	0	0
Dietary supplements <sup>a</sup>	259 (62)	156 (56)	103 (74)
Homeopathic <sup>a</sup>	245 (58.6)	197 (71)	48 (34.3)
Herbal/unani <sup>a</sup>	243 (58)	178 (64)	65 (46)
Massage Therapy <sup>a</sup>	347 (83)	268 (96.4)	79 (56.4)
Mind-body Therapy <sup>a</sup>	49 (11.7)	34 (12.2)	15 (10.7)
Reflexology	0	0	0
Reiki	1 (0.24)	1 (0.36)	0
Traditional Chinese Medicine	3 (0.72)	3 (1.1)	0
Yoga	30 (7.2)	15 (5.4)	15 (10.7)

<sup>a</sup> Significant difference ( $p < 0.05$ ) between male and female usage.

Table 3. Pakistani Pharmacy Students' General Attitudes Towards Complementary and Alternative Medicine (CAM)<sup>a</sup>

Statement	Total, No. (%), Male, No. (%), Female, No. (%),			P
	n = 418	n = 278	n = 140	
Clinical care should integrate the best of conventional and CAM practices	339 (81)	234 (84)	105 (75)	0.093
CAM includes ideas and methods from which conventional medicine could benefit.	251 (60)	178 (64)	73 (52)	0.001
A number of CAM approaches hold promise for treatment of symptoms conditions and/or diseases.	251 (60)	150 (54)	101(72)	0.001
The results of CAM are in most cases due to a placebo effect.	198 (47)	145 (52)	53 (38)	0.001
CAM therapies not tested in a scientific manner should be discouraged.	394 (94)	272 (98)	122 (87)	0.150
CAM treatments have no true impact on treatment of symptoms, conditions, and/or treatments.	64 (15)	33 (12)	31 (22)	0.007
CAM is a threat to public health.	103 (25)	78 (28)	25 (18)	0.008
Health professionals should be able to advise their patients about commonly used CAM methods.	350 (84)	234 (84)	116 (83)	0.838
CAM practices should be included in my school's curriculum.	63 (15)	39 (14)	24 (17)	0.218
Knowledge about CAM is important to me as a Pharmacy student.	287 (69)	186 (67)	101 (72)	0.675

Only a fraction of students (52, 12%) had received CAM training from a traditional healer.

## DISCUSSION

The primary focus of the present study was to assess attitudes of pharmacy students toward CAM and to evaluate their willingness to receive training and education concerning CAM. The study had a high response rate (70%, 418/595) and included a larger number of pharmacy students than previously published studies. The respondents represented a fairly homogenous population of young adults (18-25 years old) that had a common educational background. Most were living in an urban setting (Table 1). Only a minority considered CAM to have no impact on treatment (15%) or to be a threat to public health (25%). A majority of students, both male and female, had positive attitudes toward CAM (Table 3), with about 81% agreeing that clinical care should integrate conventional and CAM practices. While a majority (69%) agreed that knowledge

of CAM is important to them as future pharmacists (Table 3), 85% declined to have courses on CAM added to their current curriculum. This discrepancy may have been due to the lack of knowledge about what content would be added and the volume of information that would be added to their already full course schedule. All other responses supported the need for pharmacists to learn about CAM. The majority of respondents also favored (>66%) recommending CAM to patients under any circumstances (Table 5). The finding that pharmacy students were willing to recommend CAM therapies to patients (84%, Table 3) despite a lack of knowledge based on evidence of efficacy (71%, Table 4) should be of concern to educators and health practitioners. These tendencies observed among Pakistani students are similar to those reported for students in other parts of the world.<sup>9</sup>

Attitudes toward specific therapies varied among the respondents (Table 2), as seen with previous studies. In general, students had a positive attitude about the

Table 4. Pakistani Pharmacy Students' Perceived Barriers to Use of Complementary and Alternative Medicine (CAM)

Statement	Total, No. (%), Male, No. (%), Female, No. (%),			P
	n = 418	n = 278	n = 140	
Lack of evidence is a barrier to use	298 (71)	243 (87)	55 (39)	0.001
Lack of reimbursement is a barrier to use.	129 (31)	112 (40)	17 (12)	0.001
Relatively longer treatment time required for CAM is a barrier to use.	53 (8)	45 (16)	8 (6)	0.001
Institutional concern about legal barriers is a barrier to use.	274 (66)	210 (76)	64 (46)	0.001
Lack of staff training is a barrier to use.	246 (59)	170 (61)	76 (54)	0.001
Lack of specific equipment required for CAM is a barrier to use.	194 (46)	151 (54)	43 (31)	0.001

Table 5. Circumstances for Which Use of Complementary and Alternative Medicine (CAM) is Considered by PharmD Students

<b>Statement</b>	<b>Total, No. (%), n = 418</b>	<b>Male, No. (%), n = 278</b>	<b>Female, No. (%), n = 140</b>	<b>P</b>
If you had a condition for which no known cure existed	278 (67)	166 (60)	112 (80)	0.001
If you were experiencing long wait times for a given treatment	276 (66)	180 (65)	96 (69)	0.246
To replace conventional therapies	278 (67)	142 (51)	136 (67)	0.142
In conjunction with conventional therapies	289 (69)	235 (85)	54 (39)	0.001
For most medical problems	316 (76)	197 (71)	118 (84)	0.184
To prevent disease	278 (67)	226 (81)	52 (37)	0.001

comparative importance of CAM in medical care.<sup>32,33</sup> Massage therapy was used most by the students (83%), followed by homeopathic (59%) and herbal/unani medicine (58%). These results were expected, as these systems are rooted in local tradition and popular among the general population.<sup>16</sup> Therefore, when considering whether CAM treatments were “mainstream” or “alternative” treatments, herbal/unani medicines, along with homoeopathic medicines, were ranked as mainstream by more students than any other CAM practice.<sup>4</sup>

As in other parts of the world, the use of nutritional supplements is gaining popularity in Pakistan. Therefore, it was not surprising to find student support for supplementation.<sup>22</sup> These attitudes are similar to those of students in other health professions.<sup>16</sup> Opinions about the validity of CAM and personal experience are both likely to impact students’ views on whether CAM should be taught in health professions curriculum.

A majority of students (84%) believed that health professionals should be able to advise their patients about commonly used CAM methods (Table 3). To achieve this goal, knowledge about CAM practices should be included in the pharmacy curriculum. A significant number (59%) of the students in our study believed that lack of training is a potential barrier to use of CAM (Table 4). Therefore, training is needed in these areas, and curricula in colleges

and schools of pharmacy should include information about CAM. The training should include the evidence that is available, as most of the students believed (71%) that the greatest barrier to the use of CAM is lack of scientific support for its use.

The training of health practitioners in CAM is a rapidly evolving area. A study of British undergraduate pharmacy students found that knowledge about and use of CAM is widespread among this group of future health care professionals. Moreover, the students expressed a strong interest in the topic. In-depth studies on the knowledge and use of CAM among other health care professionals and among ethnic minorities may help management of the treatment of minor disorders as well as chronic diseases.<sup>14</sup> This is important because personal beliefs or disbeliefs in a therapy may affect the advice that a health professional gives to a patient, especially concerning CAM.

Harris and colleagues observed that the sources most commonly used by faculty members and students are pharmaceutical and other professional journals (90% and 70%, respectively) and peer professionals (87% and 65%, respectively).<sup>16</sup> Other healthcare professionals, mass media, and the Internet were also ranked highly (48%). Coursework or formal training in CAM was used by only 32% of faculty members and 38% of students.

Table 6. Sources of Information About Complementary and Alternative Medicine Used by PharmD Students

<b>Statement</b>	<b>Total, No. (%), n = 418</b>	<b>Male, No. (%), n = 278</b>	<b>Female, No. (%), n = 140</b>	<b>P</b>
CAM professionals or providers	164 (39)	97 (35)	67 (48)	0.079
Other healthcare professionals	172 (41)	95 (34)	77 (44)	0.877
Pharmacy, medical, nursing or other	268 (64)	206 (74)	62 (87)	0.283
Natural Products professional journals				
Mass media (TV, newspapers, magazines, radio, wall chalking)	203 (49)	150 (54)	53 (38)	0.116
Internet or CAM Web sites	162 (39)	95 (34)	67 (48)	0.882
Formal CAM trainings or Referral	115 (28)	67 (24)	48 (34)	0.688
Training/Apprentice with healers	52 (12)	32 (12)	20 (14)	0.994

Thus, we conclude there are no significant differences in the information sources used by faculty members and students.<sup>16</sup>

Studies of attitudes toward CAM have generally compared attitudes among classes of students or among faculty members.<sup>28</sup> Few have considered gender differences.<sup>26-28</sup> We found a number of significant gender differences in students' attitudes toward CAM. Female students were more positive about CAM use than male students: more female than male students thought that CAM approaches held promise for the treatment of symptoms and diseases (72% vs 54% [ $p > 0.001$ ]). More male students considered CAM to be a threat to public health (28% vs 18%) and to have the potential to harm patients.

Our findings regarding gender differences were consistent with results from other studies in which medical student attitudes toward CAM were examined. One study using a brief survey instrument similar to the CAM Health Belief Questionnaire indicated that female students had a significantly more positive attitude toward CAM than did male students.<sup>27</sup> A second study, using a modified version of the Integrated Medicine Attitude Questionnaire, reported that female students more frequently had positive attitudes toward the theories of holism and the overall effectiveness of treatments of CAM than did male students.<sup>28</sup> Similarly, general surveys of university students have found that women are more likely to use CAM personally and that male students are more likely to have negative attitudes toward CAM.<sup>29-31</sup> These results indicate that female students are more open to the ideas and theories supporting alternative forms of medicine than male students,<sup>31</sup> and they have more of a tendency to accept CAM than male students. However, when we compared the response of female students favoring CAM use under certain circumstances (Table 5), significantly fewer female students agree that CAM should be used as a prophylactic treatment (81% male vs. 31% female) or in conjunction with traditional therapies (85% male vs. 39% female). The majority of female responders (80% vs. 60%) were in favor of using CAM for conditions when no other therapy was known. These findings suggest that, in addition to the greater tendency of female students to accept CAM compared to male students, for specific aspects of CAM usage, female students may have a more conservative opinion. Gender-specific preferences regarding CAM need to be explored further.

## CONCLUSION

Pakistani students' attitudes toward CAM were generally positive, and students recommended the use of CAM under a variety of circumstances. Female students generally had a more positive attitude toward CAM than male students. Student perceptions regarding CAM can be

influenced by various factors such as learning, lecturers, preceptors, and practical experience. A variety of CAM practices were thought to be useful, including massage therapy, dietary supplements, homeopathic medicines, and herbal/unani medicines. Among the different types of sources consulted by students to gain knowledge of CAM, professional medical journals were the most common. Among several barriers to CAM usage, lack of scientific evidence was considered the most important. Most of the respondents urged the inclusion of CAM in the pharmacy curriculum. These results strongly support the growing international call to include information about CAM in the pharmacy-curriculum to help meet the demand of growing number of CAM users in the general populations.

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