Research Article

Attitudes and Perceptions of Undergraduate Pharmacy Students towards Complementary and Alternative Medicine

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Abstract

Background: With the increased demand for complementary and alternative medicine (CAM), pharmacists should be well-equipped with knowledge of CAM. However, most of the researches tend to focus on attitudes and perceptions of medical students, and to a lesser extent by pharmacy students. Furthermore, use and learning of CAM could be complicated by factors such as family, gender, race and year of study. The study aimed to demonstrate whether pharmacy students are comfortable in using CAM. By exploring factors that might influence the use and learning of CAM, we can understand whether there is a need of strengthening current CAM curricula. **Materials & Methods**: First year to fourth year pharmacy students from International Medical University (IMU) were invited to participate in the study. The study explored areas such as self-use and awareness of different CAM modalities, attitudes and perceptions about CAM, sources of CAM information, perceived needs and barriers to CAM as well as integration of CAM into pharmacy curricula. **Results**: 246 pharmacy students participated in the survey. Positive attitudes and perceptions about CAM were displayed following increasing year of study. Family and race were significantly associated with the use and learning of CAM. Lack of scientific evidence was the top-rated barrier to CAM use whereas parents, relatives or friends were the most preferable source of CAM information. **Conclusion**: Pharmacy students in IMU generally supported the integration of CAM courses into current pharmacy curricula. Apart from gender, students' usage and learning of CAM were influenced by family, race and year of study.

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INTRODUCTION

Complementary and alternative medicine (CAM) is a broad set of health care practices which are not regarded as part of the countries' tradition and therefore not being integrated into their dominant health care system. (1) In recent times, the acceptance of CAM among public could be seen worldwide. For instance, percentage of CAM users in developed countries such as Australia, China, Singapore and Republic of Korea were shown to increase significantly. (2) In Switzerland, the average prevalence of CAM use was reported as 49%. (3)

Pharmacists often serve as the primary healthcare professionals to the public. A study revealed that consumers prefer to approach pharmacists regarding the safety use of CAM products. (4) However, a survey conducted among Australian pharmacists reported that 57% of them considered their CAM knowledge as insufficient, thus they are not confident in answering patients' queries. (5) At present, information regarding perception of Malaysian pharmacists about CAM is not available. In view of the upsurge of CAM use, pharmacy students are therefore subjects of interest.

Over the past decades, most of the research were highlighting on attitudes and perceptions of medical students, and to a lesser extent by Malaysian pharmacy students. (6–11) Limited studies had stated

that Malaysian pharmacy students held positive attitudes about CAM and welcomed the inclusion of CAM into pharmacy curricula. (12,13) Since the incorporation of CAM education is handled differently by countries and institutions, the available university education could also affect the use and learning of CAM. Furthermore, some additional factors such as the students' level of CAM knowledge (14), race (14,15), gender (13,16,17) and family background (18) were not being investigated in the previous studies. Hence, it is worth of conducting the current study to explore pharmacy students' perception changes towards CAM.

The objectives of this study are to demonstrate whether future Malaysian pharmacists are comfortable with using and recommending CAM. By conducting this research, we can determine whether the use and learning of CAM are significantly influenced by factors such as gender, family, race and year of study. In the meanwhile, we can also understand whether current pharmacy curricula with CAM education are sufficient in preparing the future pharmacists to be reliable and evidence-based CAM information providers.

MATERIALS AND METHODS

Study Design and Setting

A cross-sectional survey was conducted among first year to final year undergraduate pharmacy students at International Medical University (IMU). The study was approved by IMU Joint-Committee on Research and Ethics. The questionnaire was designed following a complete review of relevant literature. For further validation, content of the questionnaire was piloted among 30 undergraduate pharmacy students. Their feedback was incorporated into the revised questionnaire.

Study Tool Development

The questionnaire was comprised of 8 sections. In section B, self-use and awareness of different CAM modalities as practised in Malaysia were assessed using 'Yes' or 'No' questions. If the students had used any of the listed CAM modalities, three additional questions would be asked on the effectiveness, harmfulness and likelihood of recommendation using a scale of one (very effective/very harmful/extremely likely) to five (very not effective/very not

harmful/extremely unlikely). A 5-point Likert scale (strongly agree to strongly disagree) was used to evaluate pharmacy students' attitudes (section C) and perceptions (section D) toward CAM as well as their views about integration of CAM into pharmacy curriculum (section G). Sources of CAM information (section E) were determined by providing few options and respondents could select more than one option. Barriers to the use of CAM (section F) were examined by using a Likert scale of one to seven representing extremely likely and extremely unlikely. Students' opinions about the perceived needs to CAM were also asked in section F. For the purpose of survey, 'attitude' was defined as the thought of respondents regarding CAM whereas 'perception' meant the respondents' understanding about CAM.

Data Collection

Data was collected upon self-distribution of questionnaires. Convenience sampling method was employed whereby each year pharmacy students were randomly approached. A total sample of 246 students was collected based on the calculation done by Raosoft sample size calculator. (19)

Data Analysis

Data was entered into SPSS statistics version 22. Descriptive statistics such as percentages and frequencies were used to summarize the data. For Likert scale questions, Pearson chi-square test was conducted to test for statistical association. Statistical significance was accepted at p value of <0.05.

RESULTS

Characteristics of respondents

The respondents' characteristics are outlined in (**Table 1**). Of the 246 students participating in the cross-sectional survey 20 students were first year, 97 were second year, 78 were third year and 51 were fourth year pharmacy students. Female students and Chinese population constituted the greatest proportion of 77.6% and 92.3% respectively.

Usage of CAM Modalities

Majority of the pharmacy students (88%) had previously used at least one type of CAM modalities. Significant difference ($p<0.05$) was observed between self and family usage of CAM. In terms of CAM use, male and

female students occupied a similar proportion of 87.3% and 88.5% respectively with no significant difference (p=0.814) detected. In this study, Chinese herbal medicine (72%), massage (43%) and yoga (39%) were popularly used among the respondents. As for CAM users, about half of them responded that the used CAM modalities were effective and therefore they were willing to recommend them to their patients in the future (**Table 2**).

Table 1: Demographics of the respondents (n=246)

Characteristics	n (%)
Gender	
Male	55 (22.4)
Female	191 (77.6)
Age	
Mean	21.26 ± 1.318
18-20	78 (31.7)
21-23	161 (65.4)
≥24	7 (2.8)
Race	
Malay	4 (1.6)
Chinese	227 (92.3)
Indian	6 (2.4)
Others	9 (3.7)
Religion	
Muslim	5 (2)
Buddhist	173 (70.3)
Christian	50 (20.3)
Hindu	5 (2)
Others	13 (5.3)
Year of Study	
First Year	20 (8.1)
Second Year	97 (39.4)
Third Year	78 (31.7)
Fourth Year	51 (20.7)

Attitudes towards CAM

86.2% of students were of strong opinion that CAM are not more effective than conventional medicine and only 43.1% of students used CAM therapies along with conventional medicines for their minor ailments. First year students generally consulted doctors or pharmacists before any CAM use. However, 30% of them were more likely to believe doctors' recommendation whereas fourth year students were more inclined to the pharmacists' suggestion (23.5%) (**Table 3**).

Perceptions towards CAM

In general, vast majority of the pharmacy students believed that CAM use is safe (97.2%) and thought that CAM is an appropriate treatment in any disease (94.3%). Pharmacy students held strong opinion that CAM use has fewer side effects than conventional medicine (59.3%) and therefore should not be a threat to public health (92.3%) (**Table 4**).

Sources of CAM information

The highest-rated source of CAM information came from parents, close relatives and friends (80.1%). Other health care professional such as doctors or pharmacists (22.4%) was the less endorsed source of CAM information. This is followed by formal CAM education (26.4%) (**Fig. 1**).

Perceived barriers and needs to use CAM

Lack of scientific evidence (62.6%) was endorsed as the greatest barrier to CAM use, followed by lack of trained professionals (61.4%). Approximately 98% of the students declared that CAM knowledge is useful and therefore it should be included into IMU pharmacy curricula (**Fig. 2**).

Integration of CAM in curricula

Third year (85.9%) and fourth year students (84.3%) were much more agreed with the statement 'CAM knowledge is necessary to be a well-rounded professional'. Significant difference (p<0.05) was also detected between different cohorts. About 80% of students welcome the integration of CAM education at undergraduate level because they firmly believed that pharmacists held strong responsibilities in advising public on CAM use (**Table 5**).

DISCUSSION

This cross-sectional survey identified that majority of the pharmacy students in IMU (88.2%) had previously used at least one type of CAM modalities. They were more familiar and comfortable with the use of Chinese herbal medicine (72%), yoga (43%) and massage (39%). The preference for Chinese herbal medicine was perhaps due to the racial breakdown of respondents in the study, which constituted mostly of Chinese population. From the results, it was stated that Traditional Indian medicine was used exclusively by Indian population up to 83%. Significant difference (p<0.05) was also reported for the usage of Traditional Malay

medicine among Malay population. The findings were similar to the study reported by Hasan et al whereby CAM use was significantly associated with race.(14) As people of different race, religion and culture coexist in Malaysia, use of various CAM modalities based on personal cultures is highly possible.

Table 2: Awareness and use of various CAM modalities

CAM Modalities	Awareness of CAM f(%)	Use of CAM f(%)
Traditional Malay Medicine		
Malay Herbal Medicine	157 (63.8)	49 (19.9)
Urut Melayu (Malay Massage)	126 (51.2)	21 (8.5)
Bekam (Cupping)	102 (41.5)	15 (6.1)
Traditional Chinese Medicine		
Acupuncture and Moxibustion	209 (85)	49 (19.9)
Chinese Herbal Medicine	227 (92.3)	176 (71.5)
Tuinalogy	141 (57.3)	51 (20.7)
Cupping	181 (73.6)	42 (17.1)
Traditional Indian Medicine		
Ayurveda	90 (36.6)	17 (6.9)
Siddha	30 (12.2)	5 (2)
Unani	29 (11.8)	4 (1.6)
Yoga	204 (82.9)	95 (38.6)
Homeopathy		
Homeopathy	105 (42.7)	30 (12.2)
Complementary Medicine		
Chiropractic	214 (87)	66 (26.8)
Reflexology	183 (74.4)	54 (22)
Osteopathy	112 (45.5)	14 (5.7)
Massage (Therapeutic/Swedish/Thai/Balinese/Shiatsu)	213 (86.6)	105 (42.7)
Reiki	18 (7.3)	6 (2.4)
Aura metaphysics	25 (10.2)	7 (2.8)
Colour vibration therapy	37 (15)	12 (4.9)
Crystal healing	39 (15.9)	9 (3.7)
Bach flower	20 (8.1)	8 (3.3)
Raoha	9 (3.7)	4 (1.6)
Aromatherapy	180 (73.2)	59 (24)
Nutritional therapy	168 (68.3)	58 (23.6)
Hypnotherapy	146 (59.3)	12 (4.9)
Meditation	188 (76.4)	65 (26.4)
Psychotherapy	169 (68.7)	19 (7.7)

Table 3: Frequencies, percentages and students' agreement with attitude statements across four cohorts

Statements with which students agreed	Total sample (n=246) f(%)*	First Year (n=20) f(%)*	Second Year (n=97) f(%)*	Third Year (n=78) f(%)*	Fourth Year (n=51) f(%)*	p value #
I use CAM therapies for my minor ailments	133 (54.1)	8 (40)	42 (43.3)	51 (65.4)	32 (62.7)	<0.05
I use CAM therapies for my health and well-being	137 (55.7)	12 (60)	42 (43.3)	49 (62.8)	34 (66.7)	0.087

| I use CAM therapies because they are free of side effects	88 (35.8)	11 (55)	29 (29.9)	29 (37.2)	19 (37.3)	0.155
I use CAM therapies because they are safe	109 (44.3)	11 (55)	32 (33)	41 (52.6)	25 (49)	0.085
I use CAM therapies because they are more effective than conventional medicines	34 (13.8)	3 (15)	10 (10.3)	16 (20.5)	5 (9.8)	<0.05
I use CAM with conventional medicines for my minor ailments	106 (43.1)	9 (45)	30 (30.9)	39 (50)	28 (54.9)	<0.05
I generally talk to my doctor before taking any CAM therapies	59 (24)	13 (65)	17 (17.5)	17 (21.8)	12 (23.5)	<0.05
I generally talk to my pharmacist before taking any CAM therapies	58 (23.6)	12 (60)	13 (13.4)	17 (21.8)	16 (31.4)	<0.05
I always choose CAM therapies because my doctor recommends	35 (14.2)	6 (30)	18 (18.6)	7 (9)	4 (7.8)	<0.05
I always choose CAM therapies because my pharmacist recommends	34 (13.8)	4 (20)	10 (10.3)	8 (10.3)	12 (23.5)	<0.05

* Students who strongly agree or agree with the statement. #Pearson Chi-Square

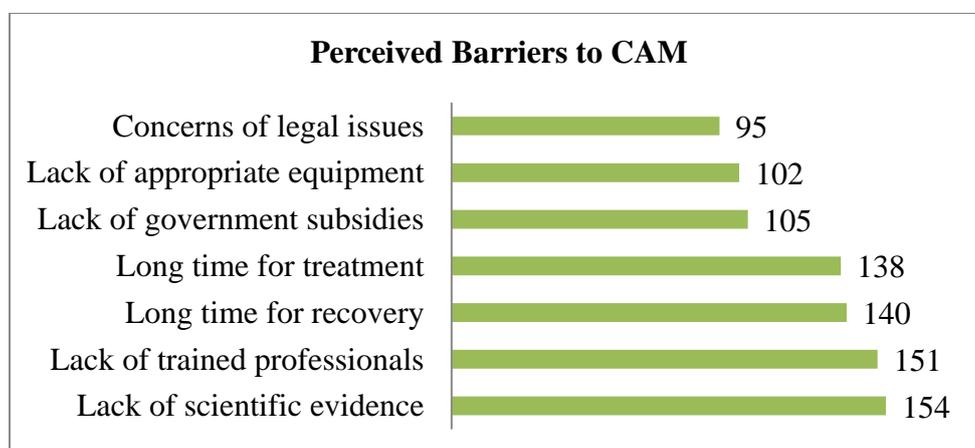**Table 4: Frequencies, percentages and students' agreement with perception statements across four cohorts**

Statements with which students agreed	Total sample (n=246) f(%)*	First Year (n=20) f(%)*	Second Year (n=97) f(%)*	Third Year (n=78) f(%)*	Fourth Year (n=51) f(%)*	p value #
I believe that CAM use is unsafe	7 (2.8)	1 (5)	3 (3.1)	2 (2.6)	1 (2)	0.230
I believe that CAM use is not an appropriate treatment in any disease	14 (5.7)	2 (10)	6 (6.2)	4 (5.1)	2 (3.9)	0.110
I believe that CAM use has fewer side effects as compared to conventional medicine	100 (40.7)	7 (35)	28 (28.9)	44 (56.4)	21 (41.2)	0.056

I believe that CAM is a threat to public health	19 (7.7)	2 (10)	8 (8.2)	7 (9)	2 (3.9)	0.084
I believe that it is important to consult any health care professional before CAM use	152 (61.8)	13 (65)	48 (49.5)	51 (65.4)	40 (78.4)	<0.05
I believe that the benefits of CAM are related to their placebo effects	66 (26.8)	3 (15)	24 (24.7)	21 (26.9)	18 (35.3)	0.229
I believe that clinical care should integrate the best of conventional and CAM use	146 (59.3)	14 (70)	45 (46.4)	49 (62.8)	38 (74.5)	<0.05
I believe that pharmacists/doctors should be able to counsel patients on CAM use	161 (65.4)	14 (70)	50 (51.5)	58 (74.4)	39 (76.5)	0.056

* Students who strongly agree or agree with the statement. #Pearson Chi-Square
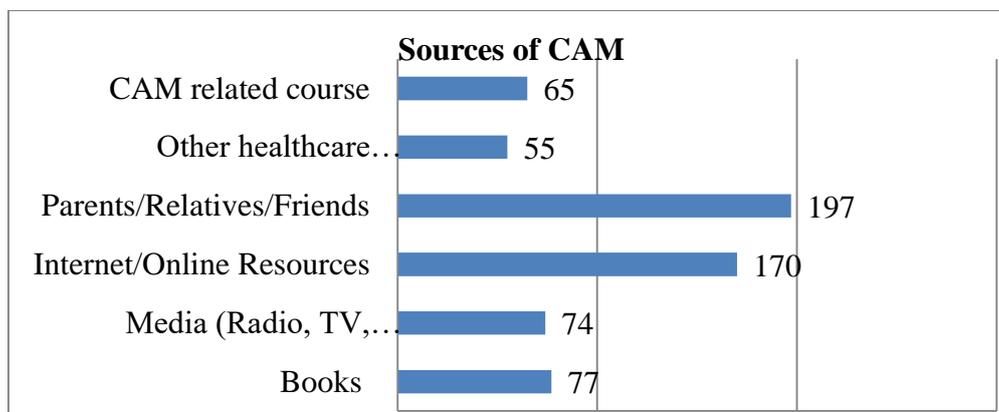
Figure 1: Responses to questions on sources of information for CAM

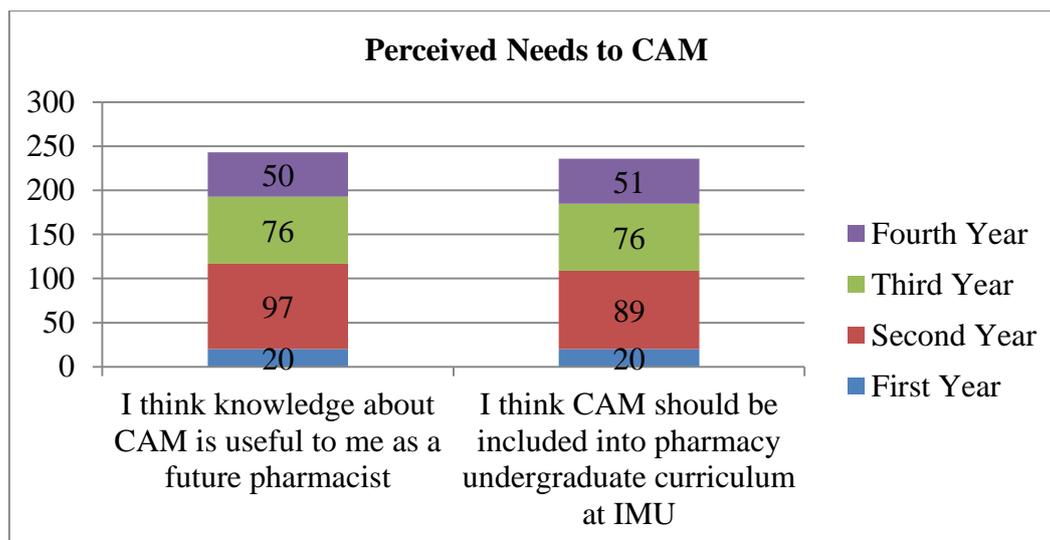**Figure 2: Responses to questions on perceived barriers to CAM**

Figure 3: Responses to questions on perceived needs to CAM

Table 5: Frequencies, percentages and students' agreement with integration of CAM education statements across four cohorts

Statements with which students agreed	Total sample (n=246) f(%)*	First Year (n=20) f(%)*	Second Year (n=97) f(%)*	Third Year (n=78) f(%)*	Fourth Year (n=51) f(%)*	p value #
CAM knowledge is necessary to be a well-rounded professional	180 (73.2)	16 (80)	54 (55.7)	67 (85.9)	43 (84.3)	<0.05
CAM is part of health sciences so it should be made compulsory in the primary degree	134 (54.5)	14 (70)	42 (43.3)	46 (59)	32 (62.7)	0.360
CAM can be offered as an elective course instead of compulsory course	153 (62.2)	15 (75)	58 (59.8)	46 (59)	34 (66.7)	0.136
CAM course should only be offered at postgraduate level	50 (20.3)	6 (30)	21 (21.6)	17 (21.8)	6 (11.8)	<0.05
Introduction of this topic will lengthen the study period	92 (37.4)	6 (30)	45 (46.4)	24 (30.8)	17 (33.3)	<0.05
CAM course is not required at all as it is the job of CAM practitioner	27 (11)	2 (10)	17 (17.5)	4 (5.1)	4 (7.8)	<0.05

* Students who strongly agree or agree with the statement. #Pearson Chi-Square

As supported by previous studies, gender did not play a role in having different attitudes or perceptions towards the use and learning of CAM. (12,15,20–22) However, this result seemed to be in contrast with other studies conducted in United States, United Kingdom, Pakistan and Czech. (15,17,23–25) The differences in results could be due to gender variations in the studied subjects. From the results, it was reported that closely related people such as parents, relatives or friends was the most

reliable sources of information for CAM. (14) Furthermore, significant difference (p<0.05) was observed in self and family usage of CAM. These findings were in line with an Australian study which stated that attitudes of students about CAM were greatly influenced by family members. (18) This result implicated that pharmacy students' use and learning of CAM were significantly influenced by family members. This is probably because they are easily accessible and more trustable to the subjects.

In this study, the attitudes and perceptions of pharmacy students about CAM were consistent with the previous findings obtained locally and internationally. (12–14,16,20,23,26) Based on the results, pharmacy students' attitudes and perceptions toward CAM were positively influenced by increasing year of study. The result was consistent with the finding reported by Jamal et al whereby third year and fourth year pharmacy students were more prone to the use of CAM for their minor ailments.(16) However, despite using CAM therapies for health and well-being, majority of the respondents (55.7%) doubted that the use of CAM is safe and only 35.8% of them claimed that they use CAM because it is free of side effects.(16,26) Among the study populations, 76% of final year pharmacy students believed that pharmacists should be able to counsel patients on the use of CAM. Again, similar to the study reported in Sierra Leone, statistical difference was observed by 74.5% of final year pharmacy students agreed that clinical care should integrate the best of conventional and CAM use. (27) Significant difference was also detected for the statement 'it is important to consult healthcare providers before CAM use'.

Similar to previous studies, lack of scientific evidence (62.6%) was the top ranked barriers to CAM use, suggesting that it is necessary to incorporate more scientific evidence of CAM in pharmacy teachings. (12,14,18,28) In accordance to the studies published earlier, respondents perceived lack of trained professionals as the second top rated barrier to CAM use which implicated that there is an insufficient of CAM education in current pharmacy curricula. (14,17,18,23,28)

Although third year and fourth year pharmacy students were more agreed with the statement 'CAM knowledge is necessary to be a well-rounded professional', they preferred CAM education to be offered as elective courses. This finding was in line with another Malaysian study. (14) Since pharmacy students in IMU had started to gain exposure toward CAM from third year onwards, this explain why they thought that CAM knowledge is useful to them as future pharmacists and therefore should be included into IMU undergraduate pharmacy curricula. They mostly denied that introduction of CAM courses will lengthen the study period.

LIMITATIONS

The study has several limitations. Due to the fact that convenience sampling method was utilized throughout the survey, the research could be subject to selection bias. Next, generalizabilty of the results could be affected because results were merely obtained from a single university with high proportion of female students and Chinese population. As the survey was cross-sectional in nature, thus it could not provide information on changes of attitudes and perceptions over time. In relative to the differences in sample sizes, settings and methodologies, it is difficult to compare these results with other similar studies.

CONCLUSION

Pharmacy students in IMU generally displayed positive attitudes and perceptions toward CAM. Majority of pharmacy students welcome the integration of CAM into current pharmacy curricula. This study revealed that the use and learning of CAM were not significantly associated with gender. However, factors such as family, race and year of study were shown to influence students' usage and learning of CAM. Future works on attitudes and perceptions of pharmacy students toward CAM should be done at other universities in Malaysia to assist in the development of standardized CAM curricula for Malaysian pharmacy students.

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