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Original article

Complementary and Alternative Medicine: Are Medical Students in AlKhobar, Saudi Arabia Interested?

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Abstract

This study aimed to assess the knowledge and attitude of medical students toward complementary and alternative medicine. A cross-sectional design was used, in which a total of 319 fourth- to sixth-year medical students at a local university hospital participated in self-administered questionnaires during the academic year of 2018-2019. The questionnaire assessed levels of perceived knowledge, attitude, and willingness to recommend complementary and alternative therapies. It showed that most students (95.6%) have heard of complementary and alternative medicine previously, and 74.6% of students held a positive attitude toward it. The majority had perceived knowledge about nutritional supplements (63.2%), prayer (60.9%), and yoga/meditation (60.9%), but less than 50% had perceived knowledge about other common therapies. Only 8.7% of the participants thought that their current knowledge about complementary and alternative medicine is adequate. Students were willing to recommend therapies that they were most familiar with, namely prayer (82%), massage (74%), and yoga/meditation (72.6%). Most students (60.5%) got their information about complementary and alternative medicine from the university curriculum. Yet, they did not believe that it provided them with adequate information. In conclusion, medical students showed a positive attitude toward complementary and alternative medicine despite their limited perceived knowledge. We recommend incorporating a complementary and alternative medicine course in the medical curricula that focuses on common therapies in Saudi Arabia.

Introduction

Complementary and alternative medicine (CAM) refers to a group of medical practices and therapies that lie outside the scope of conventional medicine, either in conjunction with conventional medicine (complementary), or used on their own (alternative) [1,2].

Health practitioners and medical students should be aware of the common modalities to advise patients on the proper use and warn them about their risks [3].

The scarcity of data regarding CAM and its modalities in the region prompted this study to assess the knowledge and attitude of medical students toward CAM, identify sources of information and assess their willingness to recommend CAM treatment(s).

Materials and Methods

Study design and setting

A quantitative cross-sectional study was performed among fourth- to sixth-year medical students at a local university hospital, during the 2018-2019 academic year. A total of 730 students were enrolled. The sample size was calculated to be 252 using EpiInfoTM version 3.1.3, at a 95% confidence level. However, 319 students completed the questionnaire, which exceeded the minimum required sample size and corresponded to a response rate of 96.6%. Students were allocated using stratified sampling with proportional allocation according to gender and academic year. The study comprised 146 males (45.8%) and 173 females (54.2%) in their clinical years: fourth year (n = 122 [38.2%]); fifth year (n = 107 [33.5%]) and sixth year (n = 90 [28.2%]).

Tools

A modified self-administered anonymous questionnaire was designed, with some questions being adapted from questionnaires used by other studies [4-7]. The questionnaire included sociodemographic factors (age, gender, academic year, nationality, marital status, parents' level of education and their occupations, and monthly household income). The knowledge section was an assessment of the participants' perceived knowledge about CAM; more specifically, whether they believed their information regarding CAM was sufficient, and their sources of information. This comprised 12 different CAM modalities: herbal therapy, massage, prayer, music, acupuncture, cupping, chiropractic, cauterization, yoga/meditation, homeopathy, aromatherapy, and nutritional supplements. The attitude section assessed students' attitude using seven three-point Likert scale statements. Points for positive statements were allocated as follows: three for agreement,

two for neutral, and one for disagreement. Negative statements were scored in reverse, as follows: three points for disagreement, two points for neutral, and one point for agreement. Finally, participant willingness to recommend different CAM modalities to patients in future practice was also assessed.

Data were collected by five data collectors, one or two collectors for each batch, one male and the other female, starting from November 2018.

A pilot study was conducted among 24 fourth- to sixth-year male and female students. Feedback from the students was taken into consideration for refinement before wider distribution. The validity of the questionnaire was assessed with the help of four academic members of the Faculty of Family and Community Medicine. Reliability measured using Cronbach's alpha was found to be 0.83.

Statistical analysis

The data were entered and analyzed using SPSS version 22.0 (IBM Corporation, Armonk, NY, USA); statistical significance was set at p-value of ≤ 0.05. Continuous data are expressed as mean and standard deviation, while categorical data are expressed as frequencies and percentages. Association(s) between different variables was measured using the t-test and chi-squared test. Missing data were very minimal, and analyses were performed using only valid data while reporting the denominator of each percentage calculated. In addition, mean scores and mean percent scores were calculated for the attitude section. A mean percent score ≥ 75% was defined as positive, 50% to < 75% as neutral, and < 50% as negative.

Results

Demographics

The mean (± SD) age of the students was 22.14 ± 0.93 years (range, 20 to 25 years). Sociodemographic characteristics of the study sample are summarized in Table 1.

Table 1: Sociodemographic characteristics of medical students in their clinical years.

Sociodemographic factors		No. (n=319)	Percent
Gender	Male	146	45.8
	Female	173	54.2
Nationality	Saudi	317	99.4
	Non-Saudi	2	0.6
Marital status (n=317)	Single	275	86.8
	Married	39	12.3
	Divorced	3	0.9
Father's education (n=318)	Less education (Illiterate, can read and write, elementary or intermediate, high school or diploma)	140	44
	Higher education (Bachelor, master or Ph.D.)	178	56
Father's occupation (n=301)	Freelance (business man, tradesman)	55	18.3
	Physician, engineer, or university professor	86	28.6
	Soldier	26	8.6
	Salesman, government employee, teacher, nurse, admin officer (secretary, writer)	97	32.2
	Other	37	12.3
Mother's education (n=318)	Less education (Illiterate, can read and write, elementary or intermediate, high school or diploma)	166	52.2
	Higher education (Bachelor, master or Ph.D.)	152	47.8
Mother's occupation (n=306)	House wife	185	60.5
	Working	121	39.5
Income (n=315)	<5,000 SAR	12	3.8
	5,000 – 10,000 SAR	51	16.2
	>10,000 SAR	252	80.0

Knowledge of CAM

The majority (95.6% [n=306]) of students previously heard of CAM. Of these students, 91.3% believed that their current knowledge about CAM was insufficient. A statistically significant difference was observed between females (96.4%) and males (85.2%).

Data reported in Table 2 revealed that the highest percentage of perceived sufficient information was observed for nutritional supplements (63.2%), prayer (60.9%), and yoga/meditation (60.9%). On the other hand, modalities with the lowest percentage of sufficient information included cauterization (11.3%), homeopathy (12%), and chiropractic (14.7%). A statistically significant difference was observed between males and females, in which male students had higher self-perceived knowledge about cupping (odds ratio [OR] = 1.89 [95% CI: 1.2–2.96]), aromatherapy (OR = 1.87 [95% CI: 1.02–3.43]), chiropractic (OR = 2.32 [95% CI: 1.2–4.5]), and homeopathy (OR= 2.01 [95% CI: 0.98–4.18]) than females. In contrast, females had higher self-perceived knowledge about yoga/meditation than males (OR = 1.55 [95% CI: 1.042–2.3]).

Table 2: Self-perceived knowledge among medical students in their clinical years regarding CAM modalities, by gender.

CAM modality	Gender						
	Males		Females		Total		
	No.	Percent	No.	Percent	No. (n=306)	Percent	X^2 (p-value)
Nutritional supplements	84	61.8	107	64.5	191	63.2	.233 (.629)
Prayer	87	64.0	98	58.3	185	60.9	1.003 (.317)

Yoga/meditation	72	53.3	112	67.1	184	60.9	5.914 (.015*)
Cupping	75	55.1	62	37.6	137	45.5	9.282 (.002*)
Massage	59	43.4	59	35.1	118	38.8	2.161 (.142)
Music	54	39.7	53	31.9	107	35.4	1.977 (.160)
Acupuncture	52	38.2	53	31.9	105	34.8	1.311 (.252)
Herbal therapy	47	34.6	55	32.9	102	33.7	.089 (.766)
Aromatherapy	30	22.1	21	12.7	51	16.9	4.613 (.032*)
Chiropractic	28	20.6	16	9.8	44	14.7	6.855 (.009*)
Homeopathy	22	16.2	14	8.5	36	12.0	4.109 (.043*)
Cauterization	17	12.6	17	10.3	34	11.3	.387 (.534)

**Association is significant at 0.05 level of significance*

The university curriculum was the most reported source of CAM information for students (60.5%), followed by family and friends (51%) and journal articles (50.6%), while herbal stores were the least reported (16.9%) (see Figure 1). However, 66.6% of students believed that the university curriculum did not provide them with adequate information regarding CAM.

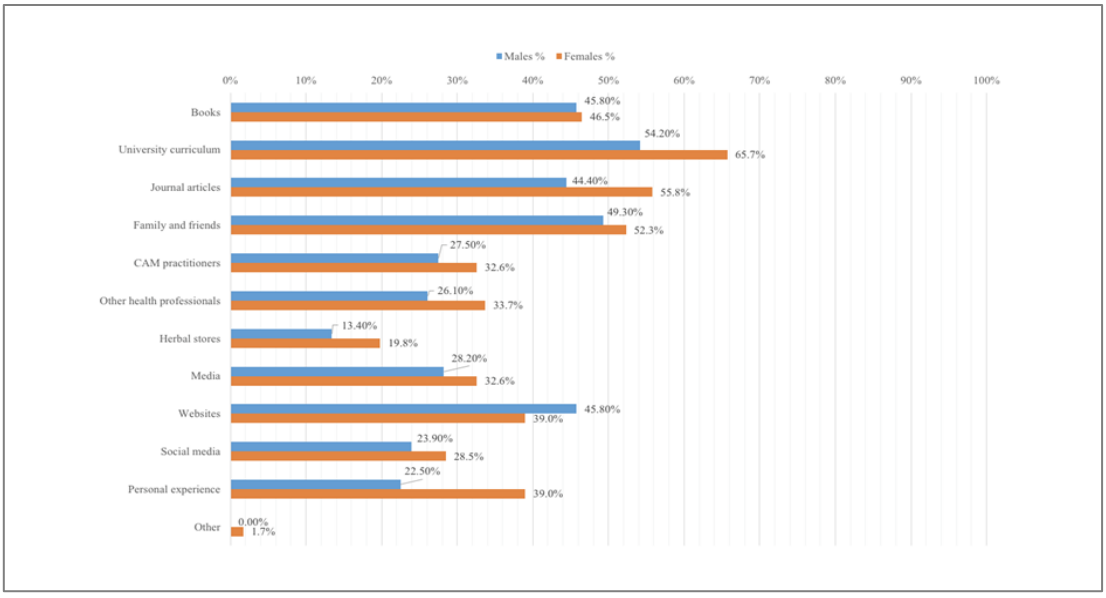

Figure 1: Sources of CAM information of medical students in their clinical years.

Females reported the following as sources information regarding CAM more than males: university curriculum (65.7% versus [vs.] 54.2%), journal articles (55.8% vs. 44.4%), and personal experience (39% vs. 22.5%); the differences were statistically significant. Websites were the only source reported by males more than females (45.8% vs. 39%), although the difference was not statistically significant.

Attitude toward CAM

The mean attitude score of medical students was 16.9 ± 2.3 (range, 7 to 21). Female students had a higher mean attitude score (17.4 ± 2) than the male students (16.3 ± 2.6). As illustrated in Figure 2, 74.6% of students exhibited a positive attitude toward CAM, while 24.8% had a neutral attitude, and 0.6% had a negative attitude.

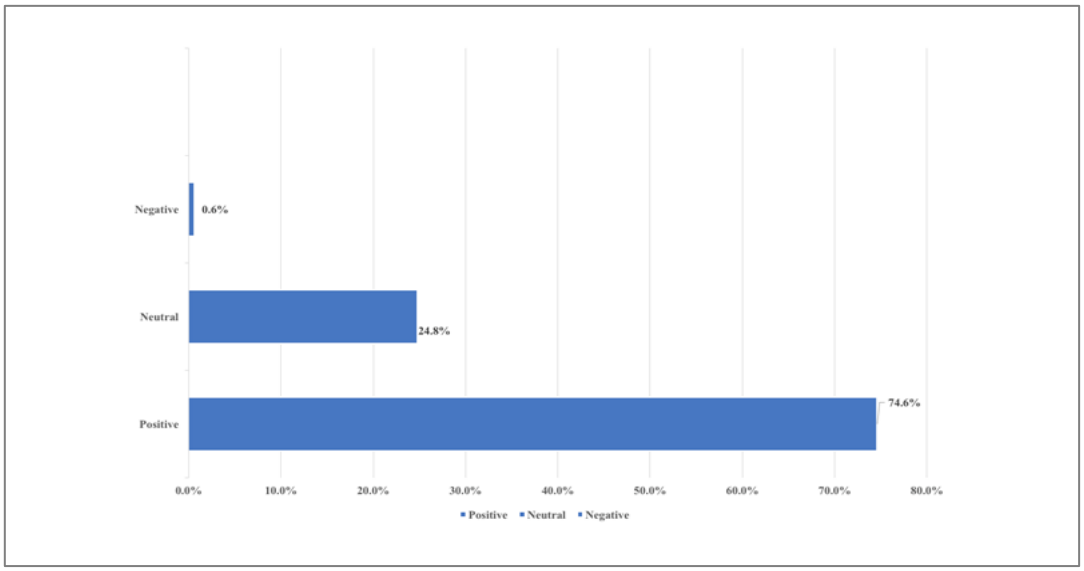

Figure 2: Attitude toward CAM among medical students in their clinical years.

Medical students' attitude toward CAM is summarized in Table 3. The data revealed that 77.7% agreed that CAM practices should be approved by the ministry of health, 67.1% believed that hospitals should hire special CAM practitioners, and 65.2% agreed that CAM practices that are not scientifically proven should be discouraged. Agreement regarding the importance of encompassing CAM practices within the medical curricula was reported by 64% of students.

Table 3: Attitudes toward CAM among medical students in their clinical years, by gender.

Attitude statement		Gender						X^2 (p-value)
		Male		Female		Total		
		No. (n=146)	Percent	No. (n=173)	Percent	No. (n=319)	Percent	
1. The effects of CAM treatments are placebo effects. *	Agree	35	24.6	35	20.3	70	22.3	1.922 (.383)
	Neutral	49	34.5	72	41.9	121	38.5	
	Disagree	58	40.8	65	37.8	123	39.2	
2. CAM practices should be approved by the ministry of health.	Agree	103	72.5	141	82.0	244	77.7	4.003 (.135)
	Neutral	29	20.4	23	13.4	52	16.6	
	Disagree	10	7.0	8	4.7	18	5.7	
3. Effectiveness of conventional medicine alone is less than that of conventional medicine combined with CAM.	Agree	61	43.0	79	45.9	140	44.6	.955 (.620)
	Neutral	57	40.1	60	34.9	117	37.3	
	Disagree	24	16.9	33	19.2	57	18.2	
4. Hospitals should hire special CAM practitioners.	Agree	73	51.8	137	79.7	210	67.1	31.844 (.000†)
	Neutral	44	31.2	30	17.4	74	23.6	
	Disagree	24	17.0	5	2.9	29	9.3	
5. CAM practices that are not scientifically proven should be discouraged.	Agree	77	54.6	127	73.8	204	65.2	12.622 (.002†)
	Neutral	41	29.1	29	16.9	70	22.4	
	Disagree	23	16.3	16	9.3	39	12.5	
6. CAM practices play no role in the treatment of serious diseases, such as cancer. *	Agree	45	31.7	50	29.2	95	30.4	3.374 (.185)
	Neutral	51	35.9	49	28.7	100	31.9	
	Disagree	46	32.4	72	42.1	118	37.7	
7. Medical curricula should encompass CAM practices.	Agree	81	57.0	120	69.8	201	64.0	5.564 (.062)
	Neutral	45	31.7	37	21.5	82	26.1	
	Disagree	16	11.3	15	8.7	31	9.9	

CAM, complementary and alternative medicine
*Negative statements
†Association is significant at 0.05 level of significance

There were significant differences in the attitude of male and female students: 79.7% of females believed that dedicated CAM practitioners should be hired in hospitals versus 51.8% of males. Similarly, 73.8% of females agreed that CAM practices that are not scientifically proven should be discouraged, versus 54.6% of their male counterparts (see Table 3).

Willingness to recommend CAM

Almost two-thirds (61.7%) of the participants would personally consider using CAM. As shown in Figure 3, the highest percentage of students were willing to recommend prayer (82%), followed by massage (74%), and yoga/meditation (72.6%) to their relatives and patients in the future. On the other hand, willingness to recommend chiropractic (14.3%) and cauterization (4.5%) was the least.

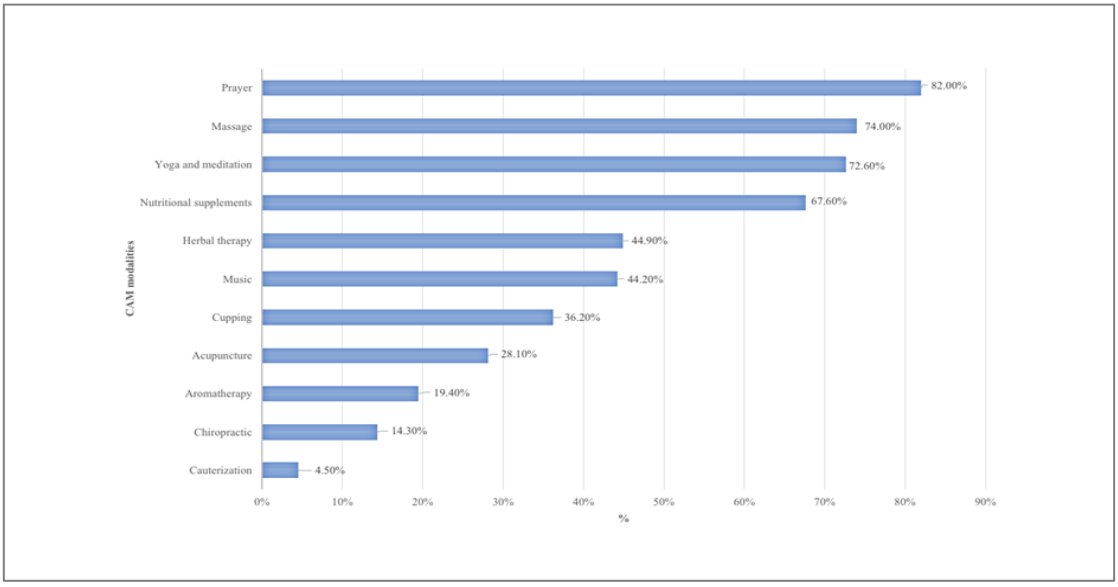

Figure 3: Willingness to recommend different CAM modalities among medical students in their clinical years.

Females reported willingness to recommend massage more than males (78.5% vs. 68.3%), as well as yoga/meditation (82.7% vs. 60.3%), with differences that were statistically significant. Conversely, males exhibited more willingness than females to recommend cupping (48.6% vs. 26%) and chiropractic (21.8% vs. 8.1%).

Discussion

Medicine has witnessed significant recent advances, and healthcare costs are rising; thus, more attention is being devoted to CAM by the population, which explains why its use has been increasing recently [8]. CAM is an important topic in the Saudi population and, accordingly, this study aimed to assess the knowledge and attitude toward CAM among clinical students at a local university hospital.

The response rate in our study was the highest (96.6%) among other similar studies conducted in Saudi Arabia (SA) (88.6%) [6] and several international studies [4,9]. This high response rate may reflect the positive attitude and willingness to learn more about CAM.

Most students in our study, however, believed that their knowledge about CAM was insufficient (91.3%). Sadeghi et al reported that 61% of Iranian students had insufficient information about CAM [7]. Furthermore, in a study from Ireland, Loh et al reported that approximately 65% of medical students did not retain sufficient knowledge about CAM [4].

The most common type of CAM used in the United States is nonvitamin, nonmineral dietary supplements, followed by deep breathing exercises and other meditation techniques, including yoga, tai chi, and qi gong. Chiropractic or osteopathic manipulation and massage therapy are also used [10]. The most commonly used CAM modality among adults in SA is spiritual practices such as prayer and reciting Quran. Other commonly used modalities include dietary supplements, herbs, and honey, while cupping was the least used [11].

In our study, nutritional supplements (63.2%), prayer (60.9%), and yoga/meditation (60.9%) were the most well-known CAM modalities among the students. In another study from SA, it was also reported that prayer is one of the five most known CAM modalities (32%) among students [6]. Yoga was also found to be one of the most well-known modalities in a study from Ghana (66.1%) [9]. Females in our study reported statistically higher knowledge regarding yoga/meditation than males (67.1% vs. 53.3%). This was in accordance with the findings reported in Ghana (70.6% vs. 60%). Conversely, our study revealed that males had higher self-perceived knowledge regarding aromatherapy (22.1%) than females (12.7%); however, the contrary was found in Ghana: more females (20.6%) were aware of aromatherapy than males (10.4%). All results were statistically significant [9].

The high level of awareness about prayer in the present study was not surprising because it was conducted in an Islamic country whose population believes in prayer and the Divine will according to God's response to supplication and faith healing. Meanwhile, awareness of nutritional supplements and yoga/meditation may be acquired from gyms and spas where they are mostly practiced.

Among 90 health colleges in SA, there are no education programs or specialized degrees in CAM. CAM courses are included in the curricula of 12.2% of colleges, while 16.7% of colleges only allude to CAM-related topics in different courses [12].

The university curriculum was found to be the main source of information regarding CAM (60.5%) in our study. This was followed by relatives and friends (51%), which was the main source of information for many students in two Saudi-based studies conducted by Ahmad et al (32.1%) [13] and Al Mansour et al (20%) [14]. This could be attributed to the fact that they trust their peers' and relatives' personal experiences and perspectives.

In the present study, a positive attitude toward CAM was exhibited by 74.6% of medical students. This percentage was higher than that of the study from Iran (49%) [7], yet comparable with the study from Ghana (75.1%). [9] Most students were in favor of integrating CAM into the medical curricula (64%). This agreement toward encompassing CAM in the curricula was also reported in several studies: 55% in Iran; 60% in Saudi; and 71.5% in Ghana [5,7,9]. However, it was found to be lower in another study performed in SA (34.3%) and in Turkey (37.9%) [6,15]. These discrepancies may be attributed to students' perception of the importance of CAM in medical practice.

Most medical students in our study (82%) were willing to recommend prayer to their patients and relatives, likely owing to the strong religious background of the Saudi population. Students were also willing to recommend massage (74%), yoga/meditation (72.6%), and nutritional supplements (67.6%), which were also among the most recommended modalities in two other studies conducted in Turkey and the United States [15,16]. This is speculated to be due to the students' personal experiences and the widespread belief among students about their clinical utility [15,17]. It is worth noting that, in the present study, the higher percentage of females recommending yoga/meditation compared with males, was congruent with their high perceived knowledge about yoga/meditation. Similarly, males reported having sufficient knowledge about cupping and chiropractic more than females and were also more likely to recommend these modalities than females. The hesitancy in recommending cauterization and chiropractic in general could be a result of students' lack of knowledge regarding these modalities. This was also observed in another study involving medical and nursing students conducted in Turkey in 2010 [15].

Our study was limited by the fact that data were self-reported and collected only from medical students in Al Khobar, SA. As such, larger-scale studies are required for the results to be more generalizable.

Conclusions

Despite having inadequate perceived knowledge about CAM, medical students exhibited a positive attitude toward it and encouraged integrating CAM into medical curricula. They also encouraged safe practices, meaning that it should be approved by the ministry of health to ensure that patients obtain accurate and unified medical advice. We recommend adding a CAM course to the curricula that focuses on common CAM therapies in SA, and their uses and possible risks.

Ethics approval and consent to participate

Ethical approval was obtained from the Office of Vice President for Research and Higher Studies of Imam Abdulrahman bin Faisal University on September 27, 2018 (IRB No. IRB- PCS- 2018-03-181). Written informed consent was obtained from all participants.

List of abbreviations

- CAM: Complementary and Alternative Medicine
- SA: Saudi Arabia

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Funding Statement

Not applicable.

Authors' contributions

NA and SI have analysed, interpreted, and written the manuscript. MS have supervised the authors throughout their project. MA have assisted in the data analysis and interpretation. Both MS and MA have revised and edited the manuscript. All authors read, provided revisions, and approved the final manuscript.

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Supplementary Materials

See the questionnaire provided in the Supplementary Material that was distributed amongst the study population.

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