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Knowledge, attitude and practices of complementary and alternative medicine among healthcare profession students in UAE

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ABSTRACT— Complementary and alternative medicine (CAM) refers to practices that do not follow the principles of conventional medicine. A cross-sectional study was conducted among students of Gulf Medical University, Ajman. The questionnaire was divided into four sections. The first section was regarding sociodemographic characteristics and the second section measured knowledge on CAM. The third section assessed attitude and the last section was regarding utilization of CAM. 330 participants took part in the survey out of which 45.8% had high CAM knowledge with Yoga, massage therapy, and herbal medicine being most known. 37.2% of respondents disagreed that their course provided them with enough information on CAM. Majority of the participants were not aware of CAM use for COVID-19 management. 79.4% of respondents had a neutral attitude. A little over half of the participants agreed on inclusion of CAM in medical school curricula. 65.8% of participants did not use CAM. Herbal medicine was the most used CAM modality. Only 28.5% used CAM as immunity booster for COVID-19 prevention. Nationality, college and CAM usage were predictors of low level of knowledge. Results from the study indicated high level of knowledge among students of GMU especially those from College of Medicine. Awareness regarding use of CAM for COVID-19 was low. 79.4% of participants had neutral attitude towards CAM. 65.8% of participants did not use CAM. Nationality, college and CAM usage were predictors of low level of knowledge.

KEYWORDS: Attitude, Complementary and alternative medicine, Knowledge, Students, Utilisation

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1. Introduction

According to the U.S. National Center for Complementary and Integrative Health (NCCIH), Complementary and Alternative Medicine (CAM) takes into account a wide range of practices and products; such as herbal medicine, manual healing techniques and mind-body interventions [1].

The global market for CAM has seen a significant increase in demand over the years [2], which sup-ports the decision of health authorities in the United Arab Emirates to establish guidelines for the professional license to prescribe CAM in the country [3]. CAM is culturally acceptable in UAE and it is the confidence and trust of UAE nationals that attributes to the popularity of CAM. According to a study from Abu Dhabi among UAE nationals, 38% of participants were taking at least one herb and a total of 65 types of herbs were being consumed as treatment for 48 conditions [4]. The COVID-19 pandemic has posed a serious challenge to the healthcare system and medical practices worldwide in several ways, including the absence of a definitive

treatment which has resulted in a large number of patients turning to CAM for treatment and supportive therapy. In a study from Saudi Arabia, 22.1% of respondents used herbal medicines during the pandemic due to belief that it is effective as COVID-19 prevention [5].

Understanding how much CAM teaching should be incorporated into the healthcare system and curricula of medical schools requires assessing the level of knowledge, attitudes and practice of CAM among healthcare professionals, including the students. A survey done among Irish medical students [6] reported 78.4% of students believed that knowledge regarding CAM is significant for their future career as healthcare professionals. Overall, they had a positive attitude towards CAM. A study from Saudi Arabia among senior medical students of King Abdulaziz University reported that the majority of the participants had a positive attitude towards the topic despite the lack of knowledge [7]. A sur-vey conducted among students of University of Sharjah [8] showed that 74% had adequate knowledge and 46% studied about it through special courses at their colleges. Majority (34%) of the subjects used CAM only once during their lifetime. It is essential for medical students to be knowledgeable on CAM with regards to implication and safety requirements for the use of CAM in relation to COVID-19. A study conducted among medical students in Nigeria reported 75.3% of subjects had good knowledge on use of CAM for COVID-19 management and 74.7% had a positive attitude [9].

Research concerning knowledge, attitude and practice among various healthcare professional students training in conventional medicine is significant from a variety of perspectives, especially in improving university teaching of CAM and development of curricula. A study conducted by Kim and Col-leagues reported that 85.4% of Korean medical schools evaluated included CAM in their medical programs and 91.4% of schools provided credit for CAM courses [10]. In a survey done in Saudi Arabia among medical students [11], 59% of the respondents supported integration of CAM into curricula of medical schools despite the overall neutral attitude.

Having adequate knowledge and positive attitude bridges the gap between patients' belief and evidence based medical care to provide high-quality patientcentred care and has the potential to make future healthcare professionals adapt their management as per patient specific needs. This study aims to bring forward the opinions of future healthcare professionals regarding CAM which we believe, can aid other professionals in the healthcare sector including policy makers and managers.

In the United Arab Emirates, studies on CAM have been conducted with different target populations including diabetes mellitus (DM) patients [12], healthcare consumers [13] and the general public [14]. However, data available concerning medical university students' knowledge, attitude and practices in the UAE is limited, especially regarding COVID-19 management.

Moreover, there is limited data on the opinion of students in the UAE regarding the importance of integration of CAM into university teaching. Assessing these attributes can aid in the further integration of CAM into the healthcare system as the say of future healthcare professionals has the potential to influence the decisions of policy makers in development and implementation of related policies. We believe our study can provide critical information which may be used to improve the situation as CAM is still a developing medical field requiring extensive study in all aspects.

The objective of this study is to assess the knowledge and attitude and to determine the utilization pattern of complementary and alternative medicine (CAM) among healthcare profession students in the UAE. The predictors of knowledge related to CAM and factors influencing knowledge and attitude are determined as

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well.

2. METHODS

2.1 Study design

The study adopted a cross-sectional study design.

2.2 Study population

The study population included students of Gulf Medical University (GMU), Ajman, UAE.
Inclusion criteria:

- Age ≥18 years
- Both genders
- Students from any nationality
- Students from all undergraduate academic programs in GMU, Ajman, UAE
- Accept to participate and sign informed consent

Exclusion criteria

- Students who are not available in campus and not accessible during period of data collection
- Students who refuse to take part in the study and do not sign the consent form.

2.3 Sampling strategy

Convenience sampling was used to collect data.

2.4 Sample size calculation

The sample size was calculated by using the equation –

$n = Z2pq/L2$

Where,

n: sample size

p: estimated proportion of the population which has the knowledge about CAM = 0.74 from the results of a study from UAE (8)

$q = (1 – 0.74) = 0.26$

L: 5% margin of error (desired level of precision) = 0.05

Z: at confidence level of 95% = 1.96

Substituting the values in the equation,

$n = (1.96)2 \times 0.74 \times 0.26 / (0.05)2$

$= 295.6$

Assuming expected refusal rate of 10%,

Minimal sample size required = 325

2.5 Study settings

The study was conducted in Gulf Medical University, Ajman, UAE.

2.6 Duration of study

The duration of study was 8 months.

2.7 Variables

The independent variables in this study are sociodemographic factors including age, nationality, gen-der, college and year of study. The dependent variables are level of knowledge, attitude and utilization of CAM.

2.8 Tool for data collection

A self-administered questionnaire with four sections was prepared after reviewing previous studies. The first section consisted of 6 questions regarding sociodemographic factors. The second section included 5 questions regarding knowledge of CAM. The third section consisted of 9 statements for assessing attitude and the fourth section included 8 questions in total regarding utilisation with two sub-sections for those who use and do not use CAM.

Participants were asked to rate their perceived knowledge on 12 types of CAM modalities using the Likert scale from very high (5) to very low (1). The highest score attainable would be 60 and lowest, 12. The scores were grouped as follows: low (12-24), average (25-36) and high (37-60).
Regarding attitude, participants were asked to rate agreement to 9 statements using the Likert scale from strongly agree (5) to strongly disagree (1). The highest score attainable would be 45 and lowest, 9. The scores were grouped as follows: negative attitude (9-18), neutral (19-27) and positive attitude (28-45).
Hard copies were distributed among students. Google form was also prepared for students who we were not able to reach out to in person.
Content and face validity of the questionnaire were validated by two experts in the field whose suggestions were incorporated.

2.9 Bias

In order to minimise non-response bias, the questionnaire was kept short and we ensured that all participants who were approached, filled out the survey completely.

2.10 Pilot study

A pilot study was conducted among 5 participants to assess feasibility and comprehension of questions and the necessary corrections were done.

2.11 Data collection

After approval from the Institutional Review Board, we approached the students of Gulf Medical University who were given the questionnaire after signing the consent form. 330 questionnaires were distributed with 100% response. The data was analysed after collection.

2.12 Ethical consideration

The study was conducted only after prior approval from the Institutional Review Board. Participants were made to sign a consent form before being handed over the questionnaire. Identity of the participant was not be revealed in the questionnaire. Participants were assured of the confidentiality of the information and only the IRB members and research team will have access to the data.

2.13 Analytical approach

Descriptive analysis was performed by using SPSS Version 28 and the data was presented by using charts and graphs. Inferential methods such as chi-square test and logistic regression were used to check the association between variables. p value less than 0.05 was considered statistically significant.

3. RESULTS

3.1 Sociodemographic characteristics

Table 1. shows distribution of sociodemographic variables among participants.
Among the participants (n = 330), majority of the participants fall under the ≥20 years category (57.9%, n =

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191) and 70% (n = 231) were female. 49.7% (n = 164) were from South-East Asia and 55.2% (n = 182) belonged to College of Medicine and 31.2% (n = 103) were in year 3 (Table 1.).

Table 1. Distribution of sociodemographic variables among participants

Age(Years)	< 20	139	42.1
	≥20	191	57.9
Gender	Male	99	30
	Female	231	70
Nationality	South-East Asia	164	49.7
	Eastern Mediterranean	124	37.6
	Others (Western Pacific, Europe, Region of the Americas and Africa)	42	12.7
Under which college does your program belong to?	College of Medicine	182	55.2
	College of Dentistry	14	4.2
	College of Pharmacy	20	6.1
	College of Health Sciences	81	24.5
	College of Nursing/ Healthcare Management Economics	33	10
Year of study	Year 1	76	23
	Year 2	88	26.7
	Year 3	103	31.2
	Year 4 and above	63	19.1

3.2 Familiarity and knowledge of CAM

When asked how familiar they were with the topic of complementary and alternative medicine (CAM), 37.3% (n = 123) of participants believed they understood basic principles of CAM (Figure 1.). Only 6 participants (1.8%) had pursued further knowledge (i.e., attended conferences, courses etc.) related to CAM. Those who were ≥20 years were more familiar with CAM (p = 0.001). Those from College of Medicine (p = <0.001) and those who studied in Year 4 and above (p = <0.001) were more familiar. However, there were no associations with gender and nationality.

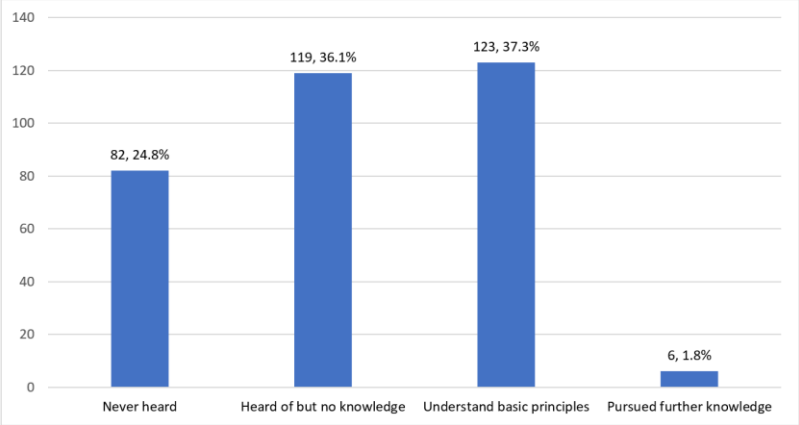

Figure 1: Distribution of participants based on familiarity with CAM

The percentage for the levels of perceived knowledge were 10.9% (n = 36) for low, 43.3% (n = 134) for average and 45.8% (n =151) for high respectively. High knowledge scores were seen in those who are ≥20 years of age (p = 0.022), from South-East Asia (p = 0.003) and students from College of Medicine (p = 0.014) (Table 2.).

Table 2. Association between sociodemographic variables and knowledge score

Variable	Subcategories	Knowledge score						Total	P
		Low		Average		High			
		Freq.	%	Freq.	%	Freq.	%		
Age(Years)	< 20	20	14.4	67	48.2	52	37.4	139	**0.022**
	≥20	16	8.4	76	39.8	99	51.9	191	
Gender	Male	12	12.1	43	43.4	44	44.4	99	0.885
	Female	24	10.4	100	43.3	46.3	100	231	
Nationality	South-East Asia	7	4.3	73	44.5	84	51.2	164	**0.003**
	Eastern Mediterranean	23	18.5	52	41.9	49	39.5	124	
	Others	6	14.3	18	42.9	18	42.9	42	
College	College of Medicine	10	5.5	79	43.4	93	51.1	182	**0.014**
	College of Dentistry	3	21.4	5	35.7	6	42.9	14	
	College of Pharmacy	4	20	6	30	10	50	20	
	College of Health Sciences	11	13.6	37	45.5	33	40.7	81	
	College of Nursing/Healthcare Management Economics	8	24.2	16	48.5	9	27.3	33	
Year of study	Year 1	14	18.4	32	42.1	30	39.5	76	0.095
	Year 2	11	12..5	38	43.2	39	44.3	88	
	Year 3	7	6.8	50	48.5	46	44.7	103	
	Year 4 and above	4	6.3	23	36.5	36	57.1	63	

3.3 Level of knowledge on individual CAM modalities

191 students (57.9%) reported having low/very low knowledge on Reiki, making it the least known modality out of the 12 types listed (Figure 2.). 190 students (54.6%) reported having high/very high knowledge on Yoga, making it the most known modality.

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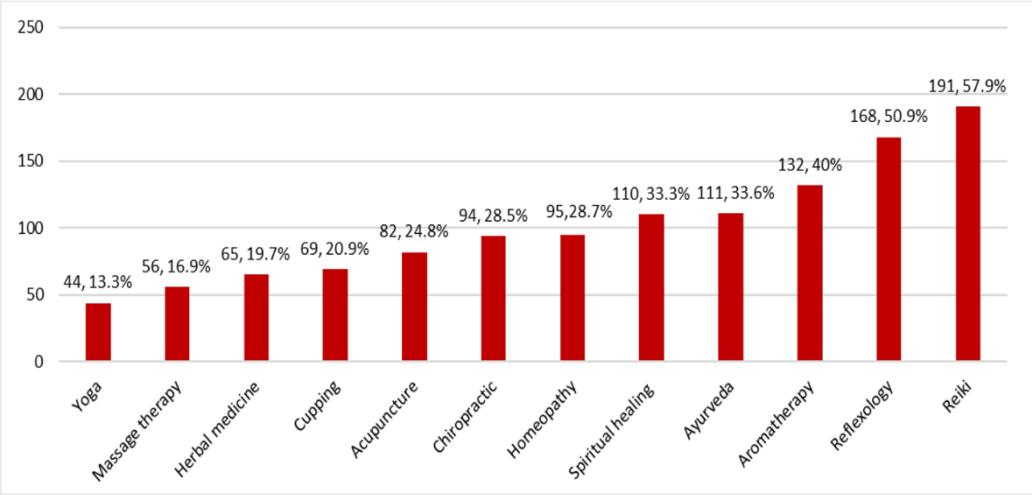

Figure 2. Distribution of participants who scored low/very low for individual modalities

3.4 Sources of information about CAM

Family/friends were the most common source of CAM information (55.8%, n = 184).

3.5 CAM in curriculum of medical school

37.2% (n = 123) of participants believe that their course/program does not provide them with adequate information regarding CAM. 57.1% (n = 8) of students from College of Dentistry disagreed to the statement, followed by 42.3% (n = 77) of students from College of Medicine.

3.6 Awareness of CAM use for COVID-19 management

Majority of participants (84.5%, n=279) were not aware of CAM being used for COVID-19. Among those who were aware, herbal medicine was the most known (47.1%, n=24) (Figure 3.).

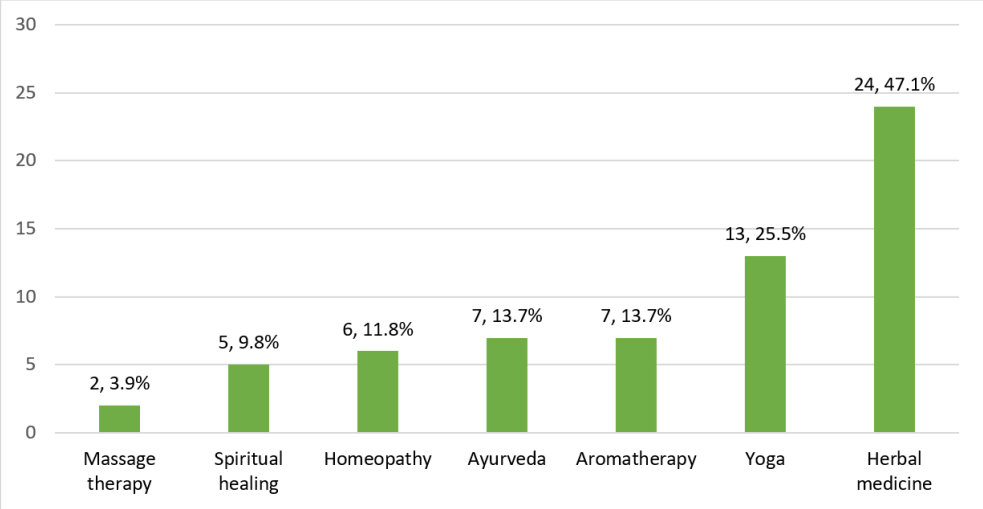

Figure 3. Distribution of participants regarding knowledge of CAM modalities in Covid-19 management

3.7 Attitude towards CAM

Majority of participants (79.4%, n = 262) have a neutral attitude towards CAM. The percentage of students who had positive and negative were 20.3% (n = 67) and 0.3% (n = 1) respectively.

54.9% (n=181) agree that CAM should be included as a subject in the curricula of medical schools (Figure

4.). 44.8% (n = 148) agreed that CAM usage has importance in COVID-19 management.

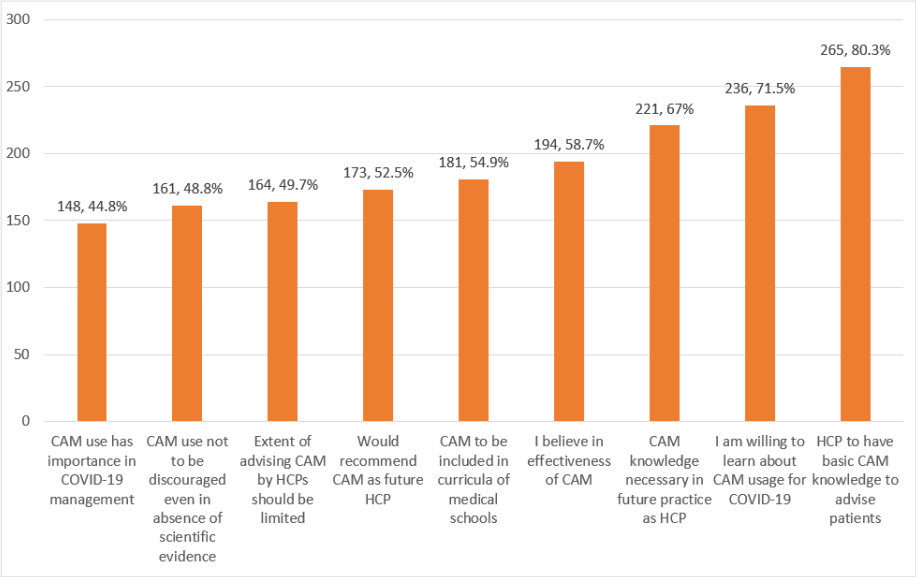

Figure 4. Distribution of participants who agreed/strongly agreed to statements

3.8 Utilization of CAM

Majority of the participants (65.8%, n = 217) do not use CAM and only 34.2% (n = 113) use CAM. Those from College of Pharmacy used CAM more than the other colleges. Those who reported that they use CAM were asked about their pattern of usage. Majority of the participants (26.5%, n = 30) reported using CAM every 2-3 months. 6.2% (n = 7) used 2-3 times per year.

Use of CAM for overall health was the most common purpose (44.2%, n = 50) (Figure 5). Most participants (67.3%, n = 76) preferred to use CAM at home. Belief in the effectiveness of CAM (40.7%, n = 46) was the most stated reason for CAM usage.

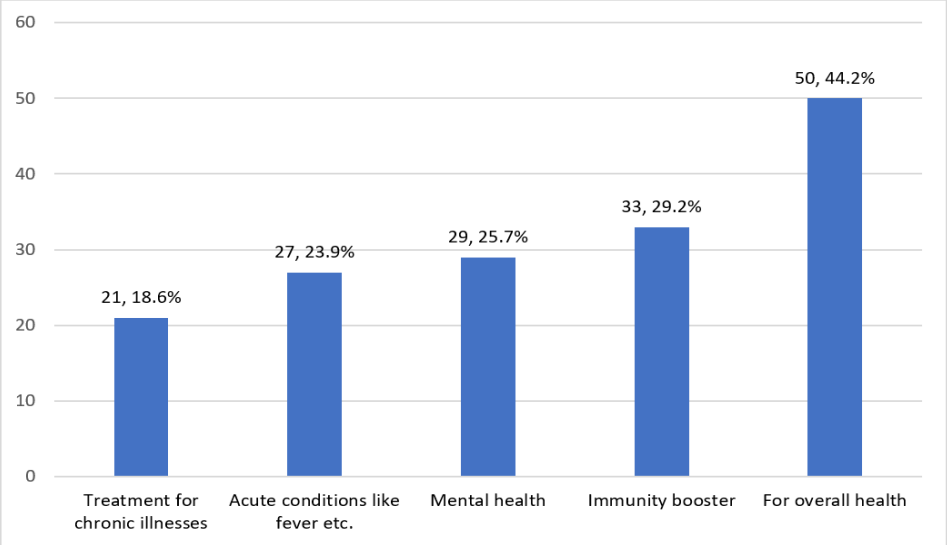

Figure 5. Distribution of participants based on purpose for CAM use

Herbal medicine (47.8%, n = 54) was the most used modality whereas Reflexology was the least used (4.4%,

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n = 5) (Figure 6.). Females used Yoga (p = 0.033) and homeopathy (p = 0.013) more than males. South-East Asians were also shown to use Ayurveda (p = 0.002) and homeopathy (p = 0.009) more than the other nationalities. Ayurveda was used more by those <20 years (p = 0.019) whereas cupping (p = 0.006) and herbal medicine (p = 0.018) were used more by those ≥20 years

Among those who do not use CAM, not having enough knowledge (50.2%, n = 109) was the most common reason for not using.

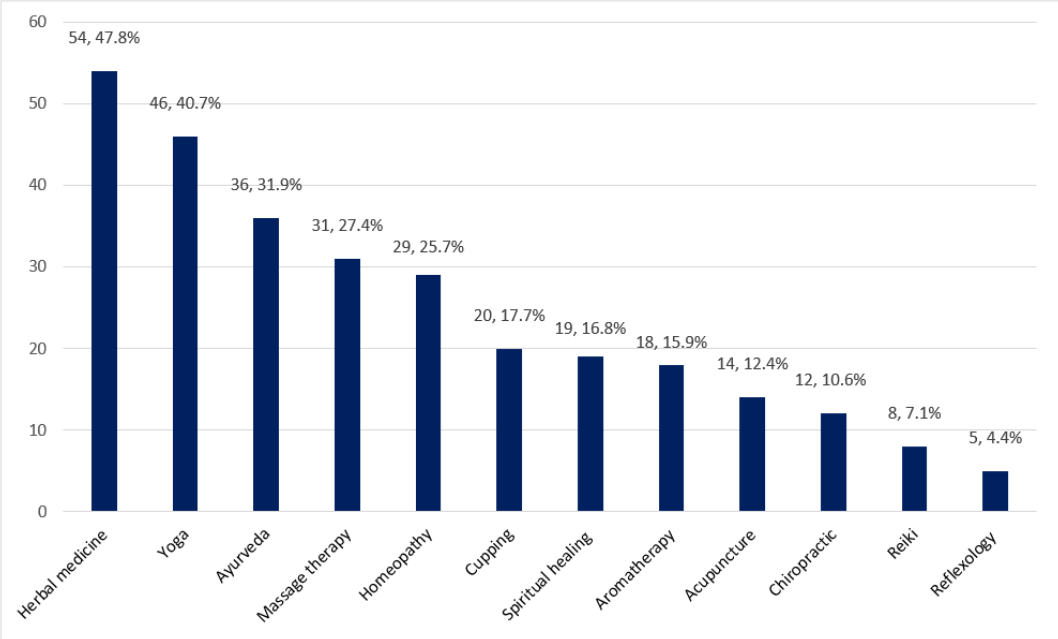

Figure 6. Distribution of participants based on type of CAM modality used

71.5% of participants (n = 236) have not used CAM for COVID-19 prevention. A little over half of the participants (52.4%, n = 173) do not recommend CAM for COVID-19 management. 82.1% (n = 271) of participants believe in the use of meditation, Yoga and prayers for dealing with psychological stress caused by the pandemic with those from other regions having more belief.

3.9 Association between knowledge, attitude and utilization of CAM

Those who used CAM had better knowledge (p = <0.001). Those with positive attitude used CAM more than those with neutral/negative attitude (p = 0.001). Those with positive attitude had more knowledge on CAM than those with neutral/negative attitude (p = <0.001).

3.10 Predictors for knowledge level among study participants

Table 3. shows predictors for knowledge among the study participants.

People from Eastern Mediterranean had 4.2 times (AOR = 4.192, CI = 1.657 – 10.603, p = 0.002) greater likelihood of having low knowledge on CAM whereas those from other regions (Western Pacific, Africa, Europe and Region of the Americas) had 3.4 times (AOR = 3.398, CI = 1.017 – 11.351, p = 0.047) greater likelihood of having low knowledge as compared to South-East Asians.

Those from College of Pharmacy had 4.3 times greater likelihood (AOR = 4.325, CI = 1.068 – 17.508, p = 0.04) and those from College of Nursing/Healthcare Management Economics had 4.1 times greater likelihood of having (AOR = 4.048, CI = 1.346 – 12.174, p = 0.013) low knowledge as compared to students from

College of Medicine.

Those who do not use CAM had 8 times (AOR = 8.013, CI = 2.294 – 27.997, p = 0.001) greater likelihood of having low knowledge compared to those who use CAM.

Table 3. Logistic regression analysis for predictors of low knowledge among study participants

Variable	Sub-category	No.	COR	C.I.	P value	AOR	C.I	P value
Age (years)	<20	139	1.838	0.915-3.692	0.087	-	-	-
	≥20	191	1	-	-	-	-	-
Nationality	South-East Asia	164	1	-	-	1	-	-
	Eastern Mediterranean	124	5.107	2.114 – 12.341	<0.001	4.192	1.657 – 10.603	0.002
	Others	42	3.738	1.185 – 11.794	0.024	3.398	1.017 – 11.351	0.047
College	College of Medicine	182	1	-	-	1	-	-
	College of Dentistry	14	4.691	1.126 – 19.542	0.034	2.918	0.640 – 13.304	0.167
	College of Pharmacy	20	4.300	1.210 – 15.276	0.024	4.325	1.068 – 17.508	0.04
	College of Health Sciences	81	2.703	1.099 – 6.650	0.03	1.997	0.783 – 5.096	0.148
	College of Nursing/Healthcare Management Economics	33	5.504	1.985 – 15.263	0.001	4.048	1.346 – 12.174	0.013
Attitude	Neutral/Negative attitude	263	1.309	0.521 – 3.287	0.567	-	-	-
	Positive attitude	67	1	-	-	-	-	-
Use CAM	No	217	6.576	1.97 – 21.949	0.002	8.013	2.294 – 27.997	0.001
	Yes	113	1	-	-	1	-	-

AOR, adjusted odds ratio; COR, crude odds ratio.

4. DISCUSSION

4.1 Knowledge

45.8% of the respondents in the current study had overall high knowledge on CAM methods. Similar results were seen in Sharjah (8) where 74% had high knowledge. Family and friends were the main sources of information on CAM in the current study (55.8%) but courses offered in university was stated by 47% of participants in Sharjah.

The most known methods in current study were yoga (54.6%), massage therapy (43.9%) and herbal medicine (40.3%) while Reiki (12.7%) and Reflexology (17.5%) were the least known. The results are somewhat consistent with those of the study in Sharjah (8) where massage therapy (65%) and Reiki (18%) were one of the most and least known CAM modalities respectively. This consistency could be explained by the multi-cultural environment of the study setting.

In the current study, high knowledge regarding CAM modalities was seen among those from College of

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Medicine (51.1%) while low knowledge was seen in College of Nursing and College of Healthcare Management Economics (24.2%). However, in Ethiopia [15], knowledge was significantly higher among pharmacy students (70.37%) than medical students. No association was seen in the current study between gender and level of knowledge of CAM whereas in Sharjah (8), significant association was seen with female students having higher knowledge. In the current study, students in year 4 and above were more aware of CAM. In Ghana as well, similar results were reported [16], where students of higher years were more aware of CAM. This may be due to the fact that students in higher years of study have clinical exposure where they may have come across CAM being used by patients.

In the current study, 37.2% of respondents disagreed that their course/program provided with adequate information regarding CAM whereas in Germany significantly higher percentage (77.1%) of participants were reported disagreeing that the teaching provided regarding CAM was sufficient [17]. A little over half of the participants (54%) agreed that CAM should be included in the curricula, which is lower than the figures reported from surveys in China (79.1%) [18] and Palestine (63.7%) [19].

4.2 Attitude

In the current study, only 20.3% of participants had a positive attitude and majority of the participants (79.4%) were neutral towards CAM. This finding is in line with a survey from Iran where 22.1% of students had positive attitude [20].

67% of respondents in the current study agree that knowledge about CAM is necessary for future practice as a healthcare professional. This finding is slightly higher than the result from King Abdulaziz University in Saudi Arabia where 50.8% of students agreed to this statement (7). In the cur-rent study, a significant association was seen between use of CAM and attitude. This finding is in line with the results of a study in Murdoch University [21]. However, the current study found no association was found between sociodemographic variables and attitude unlike previous studies done in Ethiopia [22] and Germany [17].

4.3 Utilisation

CAM utilisation was low in the current study population, with only 34.2% of participants using CAM, as opposed to a study in Jordan where 70% had used at least one CAM type [23]. There was no significant association between sociodemographic factors and CAM use except with the college. How-ever, associations with gender and age were seen in a previous study done in the United States [24] where female students and older students used CAM more.

Belief in the effectiveness (40.7%) was the main reason for CAM usage in current study which is similar to the result from the previously mentioned study done in Sharjah (39%) (8). Not having enough knowledge was the main barrier to CAM use in the current study (50.2%) whereas lack of sufficient scientific data was stated by 64% in the study from Sharjah.

Herbal medicine (47.8%), Yoga (40.7%) and Ayurveda (31.9%) were the most popular CAM modalities used in the current study. A study conducted in Sierra Leone [25] indicated herbal medicine (70%), spirituality (58.9%) and massage therapy (51.1%) to be the most used however, Ayurveda was not used by any of the participants. This finding can be explained by the fact that the current study population includes a significant number of participants from South-East Asia, where Ayurve-da originates from. In the current study, 54% of South-East Asians used Ayurveda.

With the COVID-19 pandemic, a rise in the use of CAM has been observed in the general population (26).

This necessitates the need for medical students to be aware of CAM for COVID-19 management. To our knowledge, only one other study has been conducted regarding knowledge, attitude and practice of CAM for COVID-19 among medical students (9). Only 15.5% of the current study population were aware of CAM used for COVID-19. In Nigeria, 75.3% had good knowledge regarding this. In the current study, 71.5% were willing to learn more regarding this matter whereas 81.3% were willing in the Nigerian study. Regarding personal use of CAM as immunity booster against COVID-19, 28.5% in the current study use which is slightly more than the Nigerian study.

5. CONCLUSION

45.8% of participants in the current study have high CAM knowledge. 84.5% were not aware of CAM for COVID-19 management. 79.4% of participants had neutral attitude towards CAM. 65.8% of participants did not use CAM. High knowledge scores were seen in those who are ≥20 years of age, from South-East Asia, students from College of Medicine and those who use CAM and have positive attitude towards it. No association was found between sociodemographic factors and attitude towards CAM. Those who had a positive attitude used CAM more. Those from Eastern Mediterrane-an and Other regions had greater likelihood of having low knowledge compared to South-East Asians. Those from College of Nursing, Healthcare Management Economics and Pharmacy had greater likelihood of having lower knowledge compared to College of Medicine. Those who do not use CAM had greater likelihood of having lower knowledge than those who use CAM. This study was limited to only students of Gulf Medical University and hence, the results cannot be generalized to students from other medical schools. Convenience sampling was used in this study.

6. DECLARATION

The authors declare that they have no competing interest.

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