

# Medical School Students' Attitudes, Behaviours, and Information Sources Towards Holistic Complementary and Alternative Medicine: A Cross-Sectional Study

## Tıp Fakültesi Öğrencilerinin Bütüncül Tamamlayıcı ve Alternatif Tıba Karşı Tutumları, Davranışları ve Bilgi Kaynakları: Kesitsel Bir Çalışma

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**ABSTRACT Objective:** It was aimed to evaluate medical students' attitudes, behaviours, and information sources towards holistic complementary and alternative medicine. **Material and Methods:** This cross-sectional study was applied to 980 (participation rate 80.3%) medical students between January 2023 and March 2023. Data were obtained using the sociodemographic data form and the Holistic Complementary and Alternative Medicine Questionnaire (HCAMQ). **Results:** Complementary and alternative medicine (CAM) attitude was higher in those who were younger ( $p<0.001$ ), those who were studying in the preclinical period ( $p<0.001$ ), those whose families lived in a district/village ( $p=0.002$ ), and those whose family's average monthly income was low ( $p<0.001$ ). While the most common methods heard and used were acupuncture and hypnosis, the least were prolotherapy and hirudotherapy. Of the students, 84.8% had heard of at least one CAM method before and 80.1% had used it before. The most used primary information sources were the internet (57.8%) and social media (48.4%). Of the students, 64.3% stated that these practices should be added to the medical school curriculum. Those who had not used any method before had low positive attitudes towards CAM ( $p<0.001$ ). **Conclusion:** Since the study was conducted after the coronavirus disease-2019 pandemic, it can be said that students' interest in CAM has increased. Considering most students who declare that these practices should be added to the medical school curriculum, it may be recommended that the relevant units carry out the necessary studies on the subject.

**Keywords:** Traditional medicine; complementary medicine; medical student; attitude; access to information

**ÖZET Amaç:** Tıp öğrencilerinin bütüncül tamamlayıcı ve alternatif tıba yönelik tutum, davranış ve bilgi kaynaklarının değerlendirilmesi amaçlandı. **Gereç ve Yöntemler:** Kesitsel tipte olan bu çalışma, Ocak 2023-Mart 2023 tarihleri arasında 980 (katılım oranı %80,3) tıp öğrencisine uygulandı. Veriler sosyodemografik veri formu ve Bütüncül Tamamlayıcı ve Alternatif Tıba Karşı Tutum Ölçeği (BTATÖ) kullanılarak elde edildi. **Bulgular:** Yaşı daha küçük olanlarda ( $p<0,001$ ), prelinik dönemde öğrenim görenlerde ( $p<0,001$ ), ailesi ilçe/köyde yaşayanlarda ( $p=0,002$ ), ailesinin ortalama aylık geliri düşük düzeyde olanlarda ( $p<0,001$ ) tamamlayıcı ve alternatif tıp (TAT) tutumu daha yüksekti. En sık duyulan ve kullanılan yöntemler akupunktur ve hipnoz iken en az kullanılan yöntemler ise proloterapi ve hirudoterapiydi. Öğrencilerin %84,8'i daha önce en az bir TAT yöntemini duymuş ve %80,1'i daha önce kullanmıştı. En çok kullanılan ilk bilgi kaynakları internet (%57,8) ve sosyal medyayı (%48,4). Öğrencilerin %64,3'ü bu uygulamaların tıp fakültesi müfredatına eklenmesi gerektiğini belirtti. Daha önce herhangi bir yöntem kullanmayanların TAT'a yönelik olumlu tutumları düşüktü ( $p<0,001$ ). **Sonuç:** Çalışmanın koronavirüs hastalığı-2019 pandemisi sonrasında yapılmış olması dolayısıyla, öğrencilerin TAT'a ilgisinin arttığı söylenebilir. Bu uygulamaların tıp fakültesi müfredatına eklenmesi gerektiğini beyan eden öğrencilerin çoğunluğu da göz önünde bulundurularak ilgili birimler tarafından konuyla ilgili gerekli çalışmaların yapılması önerilebilir.

**Anahtar Kelimeler:** Geleneksel tıp; tamamlayıcı tıp; tıp öğrencisi; tutum; bilgiye erişim

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The twentieth century is a period of great developments in the field of health. During this period, different systems were introduced, and studies were carried out to improve health. Following these results, developments in the field of health have progressed to include many branches of science, and accordingly, in addition to modern health services, complementary and alternative medicine (CAM) practices, which have a social and cultural background, have come to the fore.<sup>1</sup>

By the World Health Organization (WHO) CAM defined as “a combination of traditional medicine and complementary medicine”.<sup>2</sup> The most commonly used CAM practices among WHO member states in 2012 were acupuncture and herbal therapies.<sup>3</sup>

In recent years, the use of CAM has tended to increase among both healthy individuals and those with a disease.<sup>4</sup> Reasons for turning to traditional and complementary medicine practices vary depending on country and person. The most common reason was given as the idea that it is natural and harmless. Additionally, reasons such as the desire to have a healthier life, reducing the side effects of treatments, strengthening the immune system and cheap cost can be listed.<sup>4</sup> According to research, it has been seen that patients apply to traditional and complementary medicine in many cases, such as cancer, rheumatological, allergic and respiratory diseases, pain, psychological disorders and fatigue.<sup>5</sup>

CAM regulation was published in Türkiye on 27 October 2014.<sup>6</sup> Who will carry out the practices and how they will be implemented is explained in this regulation. The methods to be applied by certified physicians are also specified in the regulation. The 15 methods mentioned are as follows: apitherapy, acupuncture, phytotherapy, hypnosis, leech, homeopathy, chiropractic, cupping, larva, mesotherapy, prolotherapy, osteopathy, ozone practice, reflexology and musicotherapy.<sup>6</sup> In addition, vitamin and mineral supplements, herbal and nutritional medicines are also included in complementary medicine.<sup>7</sup>

Studies conducted in Türkiye had shown that the prevalence of use of CAM practices varies between 22.1% and 84.1%.<sup>8</sup> Its prevalence in the world varies

between 9.8% and 76.0%.<sup>9</sup> Usage frequencies in some countries are Australia 48.2%, America 42.1%, Canada 70.4%, Chile 71%, France 49.3%, Colombia 40.0% and African countries 80.0%.<sup>8</sup>

It has been shown that medical students generally obtain information about CAM practices from the environment, television-internet, books, scientific journals or healthcare personnel.<sup>10</sup> The uncontrolled use of CAM practices can cause more harm than good. The fact that CAM practices are implemented by experts in agreement with the Ministry of Health guidelines is an important element in terms of public health.<sup>8</sup> Many health practices outside of modern medicine have not been fully scientifically recorded.<sup>11</sup>

With increasing CAM practices, the fact that physicians will encounter these methods more than ever and that they are the authorized persons who can give the most accurate information about the methods shows that the emphasis on CAM practices should be increased in the training given to new physicians.<sup>12</sup> Many studies have been done to reveal the knowledge and behaviour of medical, pharmacy and nursing students regarding CAM in developed countries, and it has been determined that the students' knowledge levels are high, but data from developing countries are limited.<sup>13</sup>

Studies conducted in Türkiye in the past years revealed that the knowledge level of medical students regarding CAM practices is not high. In the studies carried out, students indicated that they did not learn information about CAM practices from the faculty, but they had positive thoughts about adding it to the curriculum at the faculty.<sup>8,10,12,14</sup> Likewise, similar results were obtained in studies conducted around the world.<sup>15,16</sup> On the other hand, since our study was conducted in the post-coronavirus disease-2019 (COVID-19) pandemic period, the study is important in terms of revealing students' attitude and use of CAM after the pandemic. Because it has been seen that the fear of coronavirus positively affects people's use of alternative methods.<sup>17</sup> In line with all these data, our aim in this study was to evaluate medical students' attitudes, behaviours, and information sources towards holistic CAM.

## MATERIAL AND METHODS

This was a cross-sectional study and carried out with Sivas Cumhuriyet University Faculty of Medicine 1<sup>st</sup>-6<sup>th</sup> grade students between January 2023 and March 2023. The number of students in these grades was 1,221 for the 2022-2023 academic period. The minimum sample size was found as ( $n=1,221$ , effect value  $d=3\%$ , confidence interval= $99\%$ ,  $p=50\%$ ) 735 using the  $n=[DEFF*Np(1-p)]/[(d^2/Z^2(1-\alpha/2*(N-1)+p*(1-p))]$  formula in the The OpenEpi Collection of Epidemiologic Calculator (Version 3.01) (Emory University, Rollins School of Public Health, USA). No exclusion criteria were determined. The study was completed with 980 students (participation rate 80.3%).

Data collection tools were applied to the participants face to face by the researchers. Students' informed consent was obtained. Ethical approval Sivas Cumhuriyet University Non-interventional Clinical Researches Ethics Committee (date: November 16, 2022, no: 2022-11/27,) was obtained. The study was conducted in accordance with the 2008 principles of the Declaration of Helsinki (<https://www.wma.net/wp-content/uploads/2018/07/DoH-Oct2008.pdf>).

The sociodemographic data form and the Holistic Complementary and Alternative Medicine Questionnaire (HCAMQ) were used.

The sociodemographic data form consisted of 13 questions inquiring about age, gender, grade, smoking, alcohol use, academic success, average monthly income of the family, place of permanent residence/where the family lives, knowledge of CAM methods, previous use of CAM by oneself and first-degree relatives, and students' thoughts about adding CAM to the medical school curriculum.

HCAMQ was developed by Hyland et al. and its validity and reliability in our country was established by Erci in 2003.<sup>18</sup> The scale consists of 11 items and is Likert type. A minimum of 11 and a maximum of 66 points can be got. As the scale score decreases, positive attitudes towards CAM increase. Cronbach's alpha value of the scale was determined as 0.72.<sup>18</sup>

SPSS Version 21.0 (IBM Corp., Armonk, NY, USA) was used for data analysis. The Kolmogorov-Smirnov test was performed to decide whether the

data were normally distributed. Descriptive statistics such as mean, standard deviation and percentage distribution were calculated. Since the data encountered parametric conditions, independent sample t-test and F test (analysis of variance) (post hoc Tamhane's T2) were used. The HCAMQ Cronbach alpha value was calculated for our study and was found to be 0.87. For statistical significance,  $p<0.05$  was accepted.

## RESULTS

The sociodemographic characteristics of the students are shown in Table 1. Most of the students participating in the study were 22 years old and over and most were female. Except for the first year, most of them had self-reported academic grades above 2 (96.1%). Most of the students stated that they live in student house, do not smoke, do not drink alcohol, and do not have any chronic diseases. The majority were those whose families lived in the city centre and had a moderate monthly income. Most of their fathers' education level was university or above, and their mother's education level was primary school or below (Table 1).

The distribution of students' HCAMQ scores according to their sociodemographic characteristics is presented in Table 2. The students' average HCAMQ score was  $29.2\pm 10.6$ . The mean HCAMQ score was higher in those aged 22 and over ( $p<0.001$ ), those who were in the clinical period ( $p<0.001$ ), those who used alcohol ( $p=0.006$ ), those whose family lived in the city centre ( $p=0.002$ ), and those whose family's average monthly income was at medium and high levels ( $p<0.001$ ) (Table 2).

Table 3 gives students' answers to questions about CAM. Among the CAM methods, the methods that the students had heard about most before and that they or their first-degree relatives had used most before were acupuncture and hypnosis, respectively. The methods they heard about and used the least were prolotherapy and hirudotherapy, respectively. 15.2% of the students declared that they had never heard of any method, and 19.9% stated that neither they nor their first-degree relatives had used any method before. The first sources of information that students used most about CAM were the internet (57.8%) and

**TABLE 1:** Sociodemographic characteristics of the students (n=980).

Variables	n	%
<b>Age (years) (<math>\bar{X}\pm</math>SD)</b>		
<22	419	42.8
$\geq$ 22	561	57.2
<b>Sex</b>		
Male	434	44.3
Female	546	55.7
<b>Year level</b>		
1	159	16.2
2	178	18.2
3	145	14.8
4	177	18.1
5	168	17.1
6	153	15.6
<b>Self-reported academic grades* (n=821)</b>		
1-2	32	3.9
2-3	386	47.0
3 and over	403	49.1
<b>Place of residence</b>		
Student house	358	36.5
Dormitory	347	35.4
Homestay	275	28.1
<b>Smoking</b>		
No	752	76.7
Yes	228	23.3
<b>Alcohol drinking</b>		
No	775	79.1
Yes	205	20.9
<b>Presence of chronic disease</b>		
No	871	88.9
Yes	109	11.1
<b>Place of permanent residence (family home)</b>		
City centre	743	75.8
District/village	237	24.2
<b>Monthly family income</b>		
Low	185	18.9
Medium	698	71.2
High	97	9.9
<b>Father's education level</b>		
Primary education and below	209	21.3
High school	243	24.8
University and above	528	53.9
<b>Mother's education level</b>		
Primary education and below	419	42.8
High school	260	26.5
University and above	301	30.7

\*Except for first year students; SD Standard deviation.

**TABLE 2:** Distribution of students' HCAMQ scores according to their sociodemographic characteristics (n=980).

Variables	HCAMQ score ( $\bar{X}\pm$ SD)	p**
Total	29.2 $\pm$ 10.6	
<b>Age (years)</b>		
<22	25.9 $\pm$ 6.8	<b>&lt;0.001</b>
$\geq$ 22	31.6 $\pm$ 12.1	
<b>Sex</b>		
Male	29.5 $\pm$ 11.1	0.393
Female	28.9 $\pm$ 10.2	
<b>Year level</b>		
Preclinical	25.8 $\pm$ 6.1	<b>&lt;0.001</b>
Clinical	32.5 $\pm$ 12.8	
<b>Self-reported academic grades* (n=821)</b>		
1-2	30.7 $\pm$ 12.3	0.145
2-3	29.3 $\pm$ 10.6	
3 and over	30.8 $\pm$ 11.4	
<b>Place of residence</b>		
Student house	29.9 $\pm$ 11.7	0.153
Dormitory	28.4 $\pm$ 9.6	
Homestay	29.3 $\pm$ 10.2	
<b>Smoking</b>		
No	28.9 $\pm$ 10.2	0.225
Yes	30.0 $\pm$ 11.9	
<b>Alcohol drinking</b>		
No	28.7 $\pm$ 10.2	0.006
Yes	31.2 $\pm$ 11.8	
<b>Presence of chronic disease</b>		
No	29.0 $\pm$ 10.3	0.206
Yes	30.6 $\pm$ 12.5	
<b>Place of permanent residence (family home)</b>		
City centre	29.8 $\pm$ 10.7	0.002
District/village	27.4 $\pm$ 10.1	
<b>Monthly family income</b>		
Low	25.6 $\pm$ 8.7	<b>&lt;0.001</b>
Medium	29.7 $\pm$ 10.6	
High	32.7 $\pm$ 12.1	
<b>Post hoc test results</b>		
Medium > Low		<b>&lt;0.001</b>
High > Low		<b>&lt;0.001</b>
<b>Father's education level</b>		
Primary education and below	28.4 $\pm$ 10.1	0.455
High school	29.4 $\pm$ 10.9	
University and above	29.4 $\pm$ 10.6	
<b>Mother's education level</b>		
Primary education and below	28.5 $\pm$ 9.8	0.178
High school	29.9 $\pm$ 11.9	
University and above	29.6 $\pm$ 10.4	

\*Except for first year students; \*\*Independent sample t test and one-way analysis of variance (Post hoc Tamhane's T2) were used; HCAMQ: Holistic Complementary and Alternative Medicine Questionnaire; SD Standard deviation.

social media (48.4%), respectively. More than half of the students reported that CAM methods and prac-

tices should be added to the medical school curriculum (Table 3).

**TABLE 3:** Students' answers to questions about complementary and alternative medicine (n=980).

Questions and answers	No		Yes	
	n	%	n	%
Which of the CAM methods have you heard of before?				
Acupuncture	256	26.1	724	73.9
Hypnosis	325	33.2	655	66.8
Ozone	501	51.1	479	48.9
Cupping	518	52.9	462	47.1
Musicotherapy	616	62.9	364	37.1
Phytotherapy	619	63.2	361	36.8
Mesotherapy	648	66.1	332	33.9
Chiropractic	687	70.1	293	29.9
Larva	807	82.3	173	17.7
Homeopathy	862	88.0	118	12.0
Reflexology	897	91.5	83	8.5
Osteopathy	914	93.3	66	6.7
Apitherapy	933	95.2	47	4.8
Hirudotherapy	937	95.6	43	4.4
Prolotherapy	958	97.8	22	2.2
None	831	84.8	149	15.2
Which of the following CAM methods have you or your first degree relative used before?				
Acupuncture	312	31.8	668	68.2
Hypnosis	404	41.2	576	58.8
Cupping	540	55.1	440	44.9
Ozone	559	57.0	421	43.0
Musicotherapy	656	66.9	324	33.1
Phytotherapy	664	67.8	316	32.2
Mesotherapy	686	70.0	294	30.0
Chiropractic	711	72.6	269	27.4
Larva	826	84.3	154	15.7
Homeopathy	877	89.5	103	10.5
Reflexology	907	92.6	73	7.4
Osteopathy	922	94.1	58	5.9
Apitherapy	939	95.8	41	4.2
Hirudotherapy	947	96.6	33	3.4
Prolotherapy	964	98.4	16	1.6
None	785	80.1	195	19.9
Which of the following is your first source of information about CAM?				
Internet	419	42.8	561	57.8
Social media	506	51.6	474	48.4
Relatives, neighbours	644	65.7	336	34.3
Medical school education	658	67.1	322	32.9
Television	744	75.9	236	24.1
Physicians	753	76.8	227	23.2
Newspaper	947	96.6	33	3.4
Do you think CAM methods and practices should be added to the medical school curriculum?				
	350	35.7	630	64.3

HCAMQ: Holistic Complementary and Alternative Medicine Questionnaire; CAM: Complementary and alternative medicine.

Table 4 presents the distribution of students' answers to CAM-related questions according to their HCAMQ scores. The scale scores of students who had previously heard of acupuncture ( $p=0.002$ ),

ozone ( $p<0.001$ ), mesotherapy ( $p=0.025$ ) and hirudotherapy ( $p=0.003$ ) were higher. Those who had previously used acupuncture ( $p<0.001$ ), hypnosis ( $p<0.001$ ), cupping ( $p=0.011$ ), ozone ( $p<0.001$ ), mu-

**TABLE 4:** Distribution of students' answers to questions about complementary and alternative medicine according to their HCAMQ scores (n=980).

Questions and answers	HCAMQ score		p*
	No ( $\bar{X}\pm SD$ )	Yes ( $\bar{X}\pm SD$ )	
Which of the CAM methods have you heard of before?			
Acupuncture	27.4±10.0	29.8±10.7	0.002
Hypnosis	28.3±11.0	29.6±10.4	0.060
Ozone	27.9±9.9	30.6±11.1	<0.001
Cupping	29.1±11.3	29.3±9.8	0.776
Musicotherapy	29.2±10.7	29.2±10.5	0.942
Phytotherapy	28.7±10.6	30.0±10.5	0.063
Mesotherapy	28.6±10.0	30.3±11.6	0.025
Chiropractic	29.1±10.7	29.4±10.3	0.665
Larva	29.3±10.6	28.6±10.6	0.450
Homeopathy	29.0±10.7	30.4±9.9	0.196
Reflexology	29.1±10.6	30.4±10.6	0.275
Osteopathy	29.2±10.7	28.9±9.4	0.862
Apitherapy	29.2±10.6	29.0±10.1	0.900
Hirudotherapy	28.9±10.2	36.1±15.2	0.003
Prolotherapy	29.1±10.5	34.5±14.0	0.083
None	29.5±10.6	27.7±10.5	0.071
Which of the following CAM methods have you or your first degree relative used before?			
Acupuncture	31.5±12.9	28.1±9.1	<0.001
Hypnosis	32.7±13.5	26.7±6.9	<0.001
Cupping	29.9±11.8	28.3±8.8	0.011
Ozone	30.2±11.7	27.9±8.7	<0.001
Musicotherapy	30.5±11.6	26.5±7.5	<0.001
Phytotherapy	30.2±11.7	27.1±7.3	<0.001
Mesotherapy	29.9±11.1	27.6±9.11	0.001
Chiropractic	29.9±11.4	27.4±7.9	<0.001
Larva	29.8±10.9	26.1±8.1	<0.001
Homeopathy	29.3±10.9	27.9±7.7	0.081
Reflexology	29.3±10.8	27.8±8.0	0.133
Osteopathy	29.4±10.8	26.3±6.1	0.001
Apitherapy	29.3±10.7	26.2±7.3	0.067
Hirudotherapy	29.1±10.5	30.8±12.5	0.378
Prolotherapy	29.2±10.6	28.8±11.9	0.886
None	28.2±9.5	33.2±13.6	<0.001
Which of the following is your first source of information about CAM?			
Internet	28.5±10.7	29.7±10.5	0.090
Social media	29.0±10.6	29.4±10.6	0.517
Relatives, neighbours	28.9±10.9	29.8±9.9	0.151
Medical school education	29.2±10.2	29.2±11.4	0.955
Television	29.0±10.6	29.7±10.7	0.358
Physicians	28.9±10.3	30.0±11.5	0.188
Newspaper	29.0±10.4	33.4±14.5	0.098
Do you think CAM methods and practices should be added to the medical school curriculum?	29.2±10.1	29.2±10.9	0.950

\*Independent sample t test was used; HCAMQ: Holistic Complementary and Alternative Medicine Questionnaire; CAM Complementary and alternative medicine; SD Standard deviation.

musicotherapy ( $p<0.001$ ), phytotherapy ( $p<0.001$ ), mesotherapy ( $p=0.001$ ), chiropractic ( $p<0.001$ ), larva ( $p<0.001$ ), and osteopathy ( $p=0.001$ ) had lower scale scores. The average scale score of those who had

never used any method before was higher ( $p < 0.001$ ) (Table 4).

## DISCUSSION

In addition to the benefits of increasing CAM practices in the world and in our country, there are also many harms. CAM practices should be performed by authorized persons such as healthcare personnel or physicians. For this reason, it is very important to measure the knowledge and attitudes of physician candidates towards CAM practices and, if necessary, to conduct curriculum-related studies.<sup>12,19</sup>

Since the average HCAMQ score of the students in our study was closer to the minimum score that can be taken from the scale (11), it can be exclaimed that the students exhibited positive attitudes towards CAM. While the average score of students was found to be  $32.7 \pm 0.17$  in a previous study conducted at the faculty of medicine with the same scale, in studies conducted with nursing students, the average score was observed to be between 25.4 and 31.4.<sup>8,20-22</sup> The results we acquired in our study were like the literature. In a review of 38 articles on the current subject, it was stated that 13-80% of medical students used CAM and that they had a positive attitude towards CAM treatments.<sup>23</sup>

Gender is one of the principal components affecting attitudes towards CAM.<sup>24</sup> In some of the previous studies, no association was found between gender and attitude towards CAM methods, as in our study.<sup>20,22,25,26</sup> However, there were also studies that detected significantly higher CAM attitudes in female students.<sup>2,8,23,27</sup> The higher scepticisms regarding CAM competence and the fear of social stigma resulting from the use of CAM in male students can be presented as the reason for this difference.<sup>28</sup> Oppositely, in the study performed by Ayraler et al. with medical students, they found that male students were more willing to apply CAM practices in their future professional lives than female students, and they stated that professional anxiety and personal satisfaction may be the possible reasons for this situation.<sup>26</sup>

We detected that the average HCAMQ score of older students was higher, meaning that their positive attitudes towards CAM decreased. Similarly, Öcal

Kırsoy et al. found in their study that attitudes increased positively as age decreased.<sup>8</sup> As in our study, it has been recovered in previous studies that clinical period students have lower positive attitudes towards CAM.<sup>2,8</sup> In fact, a recent study found that non-medical students had better knowledge of CAM, perceived CAM to be more effective than medical students, and were more likely to recommend it to others.<sup>29</sup> In our study, positive attitudes towards CAM were higher among those with lower family average monthly income. In the study of Öcal Kırsoy et al., it was seen that students with middle income level had a significantly more positive attitude than those with low income level.<sup>8</sup> Oppositely, there are also studies that do not detect a significant relationship between family income level and attitudes towards CAM.<sup>12,20,27</sup> It can be expected that families with low-income levels will turn to CAM. In support of this, in a study conducted with parents who applied to the paediatrics clinic in Ankara, it was determined that CAM practices started from the neonatal period in those with low income levels and were widely used without the recommendation of healthcare professionals.<sup>30</sup>

Similar to our study, in most of the studies did on the subject, no significant association was gotten between the educational status of the parents and the attitudes of medical students towards CAM methods.<sup>20,27</sup> Instead, there are also studies finding that maternal education positively affects students' CAM attitudes.<sup>12,25</sup> In their study, Sönmez et al. interpreted this situation as women's positive attitude towards CAM practices may have significant effects on their children, but they recommended that points that would shed light on this condition should be taken into consideration in future studies.<sup>12</sup> In the study conducted by Aktaş like our study, it was acknowledged that the place of residence did not make a significant difference in terms of attitudes towards CAM methods.<sup>20</sup>

In our study, more than 80% of the students had heard of at least one CAM method before and had used it themselves or a relative. In a study performed with medical students before the COVID-19 pandemic, it was established that only 22.1% of the students used any of the CAM methods, while in a study performed during the pandemic period, it was stated

that 75% of the students used CAM methods.<sup>8,25</sup> Considering that our study was conducted in the post-pandemic period, we can say that the pandemic led students to use CAM methods more. As a matter of fact, Karacan et al. found in their studies that the fear of coronavirus positively affected people's use of alternative methods.<sup>17</sup>

When we looked at previous studies, we observed that acupuncture and hypnosis were the most well-known CAM methods among medical students, as we found in our study.<sup>2,8,10,31</sup> In a study handled with medical students in the UK where knowledge about CAM practices was measured, acupuncture was shown to be among the 3 most well-known methods.<sup>32</sup> Similar to our study, in different studies, the least known CAM methods, especially prolotherapy, were listed as apitherapy, osteopathy, mesotherapy, homeopathy and reflexology.<sup>2,8,31,33</sup>

It was examined in previous studies that the first sources of information used most by medical students about CAM were the internet and social media, parallel to ours.<sup>2,8,25,26</sup> Sönmez et al. also reported that medical students learned information about CAM from the internet, environment, social media and television.<sup>12</sup>

Similar to our study, in previous studies, more than half of medical students reported that CAM methods and applications should be included to the medical school curriculum.<sup>2,25,31</sup> In the study conducted by Basatemür et al., it was stated that 33.8% of male students and 40.1% of female students agreed with this opinion.<sup>33</sup> In the study by Alzahrani et al., students stated that CAM knowledge was important for their professional careers, even if they were reluctant to include CAM subjects in the medical education curriculum.<sup>34</sup> This was like the results of earlier studies on the subject.<sup>12,35</sup>

In our study, medical students who had heard of some CAM methods (acupuncture, ozone, mesotherapy and hirudotherapy) had low positive attitudes towards CAM, while those who had used some CAM methods (acupuncture, hypnosis, cupping, ozone, musicotherapy, phytotherapy, mesotherapy, chiropractic, larva, and osteopathy) before had high positive attitudes towards CAM. In fact, we examined

that those who had never used any method before had low positive attitudes towards CAM. Previous studies have also shown that experiencing the methods before makes the view towards CAM more positive.<sup>8,26</sup>

The limitations of our study may be that it was conducted with students studying at only one medical faculty and did not include the CAM attitude of students before the COVID-19 pandemic. Instead, the fact that the study was completed with a high number of participants and that it revealed the students' attitudes towards CAM after the COVID-19 pandemic can be said to be its strengths.

## CONCLUSION

As a result, we determined that younger age, studying in the preclinical period, family living in a district/village, and low monthly income affected the CAM attitude positively for medical students. Most students had heard of and used at least one CAM method. While the most common methods heard and used were acupuncture and hypnosis, the least were prolotherapy and hirudotherapy. The first most used sources of information were the internet and social media. More than half of the students declared that CAM should be included to the medical school curriculum. We found that those who have used CAM methods rather than having heard of them before, have higher positive attitudes towards CAM. Since the study was conducted after the pandemic, it can be assumed that students' interest in CAM has increased compared to previous studies. Considering most students who declare that these practices should be included to the medical school curriculum, it may be suggested that the relevant units perform the required considerations on the subject.

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### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or mem-*



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### Authorship Contributions

**Idea/Concept:** İrem Akova, Ayşe Pınar Ayılğan, Cengizhan Mercan, Elif Nur Duman, Merve Adıgüzelöğlü Dağdeviren, Merve Gül Dolmuş Dirican; **Design:** İrem Akova, Ayşe Pınar Ayılğan, Cengizhan Mercan, Elif Nur Duman, Merve Adıgüzelöğlü Dağdeviren, Merve Gül Dolmuş Dirican; **Control/Supervision:** İrem Akova; **Data Collection and/or Processing:** Ayşe Pınar Ayılğan, Cengizhan Mercan, Elif Nur Duman, Merve

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