



Research article

Physiotherapy-rehabilitation, and nursing students' complementary therapy attitudes and level of use

Genç Köse Burcu^{a,*}, Kefeli Çol Bahar^b, Gümüşler Başaran Ayşe^a^a Faculty of Health Sciences of Recep Tayyip Erdogan University, Rize, Turkey^b Güneş School of Physical Therapy and Rehabilitation of Recep Tayyip Erdogan University, Rize, Turkey

ARTICLE INFO

Keywords:

Complementary therapy
Nursing student
Physiotherapy

ABSTRACT

Background: The World Health Organization and the Ministry of Health care about traditional and complementary medicine practices. Evaluating the attitudes of physiotherapy-rehabilitation students and nursing students toward conventional and complementary practices holds significant importance in healthcare education and practice. However, it is worth noting that a limited body of research focuses explicitly on these student groups.

Methods: This cross-sectional study was conducted with 446 students in the departments of physiotherapy-rehabilitation and nursing in a university's faculty of health sciences. The data were collected using the Complementary, Alternative, and Conventional Medicine Attitude Scale (CACMAS) and the Complementary and Alternative Medicine Approaches Scale (CAMAS). The analyses used percentages, averages, standard deviation, Student's t, Mann-Whitney U, one-way ANOVA, Kruskal-Wallis analysis, the Scheffe post hoc test, and Pearson correlation.

Results: 95.5 % of the students did not use complementary therapy previously; the education process of 89.7 % did not cover complementary treatment; 73.3 % stated that complementary therapy education should be given at schools; 74.2 % wanted to use complementary therapy. However, 94.2 % reported that the Ministry of Health did not know about complementary therapy regulations. The average total score was 25.44 ± 8.953 for the Complementary and Alternative Medicine Approaches Scale and 111.29 ± 16.092 for the Complementary, Alternative, and Conventional Medicine Attitude Scale.

Conclusion: The students believed conventional and complementary therapy methods should be used for patients, and they expressed a keen interest in their professional practice after graduation.

1. Introduction

Individuals with health problems seek remedies in various traditional and complementary treatments and contemporary medicine [1]. While complementary therapy supports health, conventional methods like herbs and mind-body-mental treatment have been applied throughout history [2]. Complementary therapy is valuable in meeting the basic health needs of the public. The World Health Organization (WHO) describes traditional and complementary therapies as ever-evolving health practices and supports them [3,4]. The Institute of Traditional and Complementary Medicine Practices (TCMP) was established in Turkey in 2014 [4]. In the same year, a

* Corresponding author. Recep Tayyip Erdogan University Faculty of Health Sciences Fener kampüsü, 53100, Rize, Turkey.
E-mail address: burcu.kose@erdogan.edu.tr (G.K. Burcu).

<https://doi.org/10.1016/j.heliyon.2024.e32982>

Received 8 May 2023; Received in revised form 28 May 2024; Accepted 12 June 2024

Available online 18 June 2024

2405-8440/© 2024 Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

regulation was issued by the Ministry of Health in Turkey, and leech application, chiropractic, cupping, phytotherapy, prolotherapy, osteopathy, reflexology, and music therapy were identified as TCMP. This regulation acknowledges that health professionals, including nurses and physiotherapists holding essential training certificates, can assist certified physicians in various units [5]. Furthermore, regulations explicitly state that nurses can evaluate and assess community usage of alternative medicine practices [6].

Traditional and complementary medicine practices enhance the body's natural healing abilities and actively empower individuals to engage in their treatment journeys [7]. Additionally, the absence of side effects associated with complementary therapies, in contrast to pharmaceutical treatments, contributes to the growing utilization of traditional and complementary approaches [8]. Hence, healthcare professionals need to know about these practices, engage with all patients, and maintain a positive attitude toward them [7].

Numerous studies have demonstrated the effectiveness of complementary practices, including mental techniques (acupuncture) [9], nutritional interventions (garlic) [10], and biological methods (ozone and aromatherapy) [11–13], in promoting healing and overall well-being. The use of TCMP in Turkey was found to be 60.5 % in 2017 [14]. In Europe and Asia, 20–80 % of individuals use TCMP in health care [4,15]. The usage levels of complementary medicine practices by country between 1999 and 2011 are as follows: 35 % in the United States (USA), 73 % in Canada, 69 % in Australia, 75 % in South Korea, % in South Korea. 71. Chile and 40 % in China [7].

Internationally, there has been a growing interest in traditional and complementary therapies [16]. Patients primarily use these therapies to alleviate pain [17] and address musculoskeletal conditions [18]. Since physiotherapists are health professionals who try to relieve pain and improve loss of function in the musculoskeletal system [19], TCMP can be considered their main field of study. Relevant studies have shown that traditional and complementary medicine is effective, especially in musculoskeletal pain such as back, neck, and waist pain [20,21], and physiotherapists take a favorable view of these applications [22]. In a review study, it was argued that patients should be supported to use acupuncture in the treatment of fibromyalgia thanks to its potential benefits and freedom from side effects [23]. In addition, it has been reported that music therapy applied to patients with multiple sclerosis, in whom physiotherapy can be used, produces an improvement in clinical symptoms [24] and that the salat/prayer activity applied after knee arthroplasty improves the range of motion of the knee joint [25]. After all these considerations, it is crucial to discuss how traditional and complementary treatment applications are used in physiotherapy and rehabilitation and how the students in this area feel about these uses. It is known that nurses include TCMP practices in nursing care [17,26–29]. A study from Iran concluded that nurses had positive attitudes toward complementary therapy practices but lacked knowledge [30]. The relevant literature on the use of TCMP is mainly aimed at working nurses, and studies on student nurses are limited [31]. Physiotherapy-rehabilitation, and nursing students represent future healthcare professionals who will interact extensively with society and play a pivotal role in delivering continuous healthcare services. Consequently, assessing these students' thoughts, attitudes, and utilization patterns concerning traditional and complementary medicine practices becomes crucial.

Despite the increasing interest in traditional and complementary therapies, there is a lack of knowledge about the diversity and effects of these practices in society [2], and patients cannot obtain the information they need from health professionals [15]. The use of conventional and alternative medicine is an area where nurses effectively inform patients, yet they are concerned about the issue [32]. In a study carried out in the USA, nursing students expressed their willingness to incorporate and recommend complementary therapies in their practice. However, they identified a lack of knowledge as a significant barrier to doing so [33]. Similarly, in Canada, health science educators have determined that physical therapy, rehabilitation, and nursing students should receive foundational education in complementary therapies [34]. Therefore, nurses and physiotherapists in charge of delivering health services must be knowledgeable about traditional and complementary therapies and give correct information to people who wish to utilize these therapies [18].

The World Health Organization and the Ministry of Health care about TCMP. Because physiotherapy-rehabilitation and nursing students are prospective health professionals, it is crucial to ascertain their understanding of and attitudes toward TCMP. However, there is a lack of literature on these groups. Based on this gap, this study aimed to determine the attitudes and utilization levels of physiotherapy-rehabilitation and nursing students about complementary therapy applications.

2. Materials and methods

2.1. Study design and sample

The research was conducted with students studying at Recep Tayyip Erdogan University between March and May 2022. It is a cross-sectional study. The population of the research consists of 650 students studying at the vocational school of physical therapy and the faculty of health sciences. The study was completed with 446 students, 161 physiotherapy-rehabilitation and 285 Nursing students, who agreed to participate in the research and whose written consent was obtained. 69 % of the population was recruited for the study.

2.2. Instrumentation

The Student Descriptive Information Form, the Complementary and Alternative Medicine Approaches Scale, and the Traditional Complementary Medicine Attitude Scale were used to collect the data. The researcher distributed the forms in the classroom, and the students were asked to complete them.

2.2.1. The student descriptive Information Form

The student descriptive information form comprises a total of 18 questions. Among these, six pertain to the students' socio-demographic characteristics, including age, gender, department, grade, place of residence, and income status. Three questions are designed to gather information on chronic disease status, smoking habits, and alcohol consumption, and nine questions focus on eliciting information about the students' knowledge and experiences related to traditional and complementary medicine practices.

2.2.2. The complementary and alternative medicine approaches scale (CAMAS)

The CAMAS was developed and validated by Can et al., in 2009 [35]. It consists of 61 items and five subscales: herbal, nutritional, religious, mental, and biological approach. Herbal (linden, green tea, sage, rosehip, etc.), nutritional (honey, molasses, etc.), religious (praying, carrying nuska, etc.), mental (meditation, exercise, etc.), biological (rabbit blood, turtle blood etc.). The items are scored as "0: not using" and "1: using". Total and subscale scores are obtained on the scale. The lowest and highest scores obtained from the scale are 0 and 61, respectively. High scores indicate a more frequent use of complementary and alternative medicine. The Cronbach's alpha value of the scale is 0.85. In this study, the Cronbach's Alpha value was 0.872 for the Herbal Approaches sub-dimension, 0.892 for the Nutritional Approaches sub-dimension, 0.527 for the Religious Approaches sub-dimension, 0.900 for the Biological Approaches sub-dimension, 0.340 for the Mental Approaches sub-dimension, and 0.915. for the total value of the scale.

2.2.3. The complementary, alternative, and conventional medicine attitude scale (CACMAS)

The CACMAS was created by McFadden et al. (2010), and its Turkish validity and reliability were performed by Köse et al. (2018) [36,37]. There is no cut-off value in this scale with three subdimensions (Intellectual View of Complementary Medicine, Dissatisfaction with Modern Medicine, and Holistic View of Health), and a high score indicates a positive attitude toward traditional and complementary medicine. It is a 7-point Likert-type scale, and 22 items are positive (items 2, 3, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27) and five items are negative (items 1, 4, 8, 9, 26). Negative statements were reverse-coded. The lowest and highest scores obtained from the scale are 27 and 189, respectively. The Cronbach Alpha value of the scale is 0.808. The Cronbach Alpha value was 0.758 for the intellectual view of the complementary medicine subdimension, 0.771 for the dissatisfaction with the modern medicine subdimension, 0.751 for the holistic view of health subdimension, and 0.745 for the total scale.

2.3. Ethical considerations

Ethics approval was received from Recep Tayyip Erdoğan University social and human sciences ethics committee (2022\46). Institutional permissions were obtained from the university's vocational school of physical therapy (March 16, 2022/652) and the faculty of health sciences (March 15, 2022/963). Students approved the informed consent form before filling out the forms.

2.4. Statistical analysis

In the statistical analysis of the data, the SPSS 22 package program was used, and descriptive data were expressed as percentages, mean, and standard deviation (Table 1). Kruskal Wallis and Mann Whitney U were used to compare The Complementary and alternative medicine approaches scale and The complementary, alternative and conventional medicine attitude scale with independent variables (Tables 2 and 3). Spearman correlation analysis was used in Correlation analysis of CAMAS and CACMAS (Table 4). In correlation analysis, 0–0.19 was considered "no relationship," 0.20–0.39 "weak relationship," 0.40–0.69 "moderate relationship," 0.70–0.89 "strong relationship," and 0.90–1.00 "solid relationship." $p < 0.05$ was evaluated as significant.

3. Results

According to the results, 75.6 % of the participants were female, and their mean age was 20.99 ± 1.58 years. 63.9 % were nursing students. 25.6 %, 29.6 %, 23.1 %, and 21.7 % were first, second, third-, and fourth-year students, respectively. 51.6 % lived in the city center, 52.5 % had income equal to expenses, and 5.8 % had chronic diseases. 16.4 % smoked, and 13.9 % consumed alcohol. 77.6 %

Table 1
Mean scores of the scales (N = 446).

	n	Minimum	Maximum	Mean	Std. Deviation
The Complementary and alternative medicine approaches scale (CAMAS)	446	0	54	25.44	8.953
Herbal approach	446	0	27	8.75	5.208
Nutritional approach	446	0	18	13.61	4.106
Religious approach	446	0	5	2.07	1.088
Biological approach	446	0	3	0.01	0.15
Mental approach	446	0	5	1	0.788
The complementary, alternative and conventional medicine attitude scale (CACMAS)	446	60	159	111.29	16.092
Intellectual view of complementary medicine	446	14	55	33.4	7.64
Dissatisfaction with modern medicine	446	10	66	31.42	9.66
The holistic view of health	446	11	82	46.48	8.665

Std. Deviation: Standart Deviation.

Table 2
The CAMAS with some variables (N = 446).

		n	Herbal approach Mean Rank	Nutritional approach Mean Rank	Religious approach Mean Rank	Biological approach Mean Rank	Mental approach Mean Rank	CAMAS Total Mean Rank
Place of residence	City	230	213.55	210.08	215.8	222.5	223.67	210.79
	District	144	229.95	238.06	229.86	224.05	238.68	234.59
	Village/ Town	72	242.4	237.26	235.38	225.6	192.59	241.92
Smoking			KWX ² :3.292 p = 0.193	KWX ² :5.225 p = 0.073	KWX ² : 2.021 p = 0.364	KWX ² : 2.659 p = 0.265	KWX ² :7.212 p = 0.027	KWX ² : 4.782 p = 0.092
	Yes	73	269.59	243.87	185.8	222.5	257.03	261.42
	No	373	214.48 MWU: 10250.0 p = 0.001	219.51 MWU: 12127.5 p = 0.137	230.88 MWU: 10862.5 p = 0.004	223.7 MWU: 13541.5 p = 0.531	216.94 MWU: 11166.5 p = 0.008	216.08 MWU:10846.0 p = 0.006
Alcohol	Occasionally	46	262.83	231.3	175.43	222.5	267.7	254.38
	Frequently	16	231.13	237.78	223.16	222.5	177.66	226.22
	Never	384	218.47 KWX ² :4.940 p = 0.085	221.97 KWX ² :.425 p = 0.809	229.27 KWX ² : 8.128 p = 0.017	223.66 KWX ² : 0.324 p = 0.851	220.12 KWX ² :9.045 p = 0.011	219.69 KWX ² : 2.989 p = 0.224
Hearing about the TCMP	Yes	100	249.47	228.73	239.13	222.5	259.66	246.84
	No	346	216 MWU: 14703.5 p = 0.022	221.99 MWU: 16777.5 p = 0.643	218.98 MWU: 15737.5 p = 0.143	223.79 MWU: 17200.0 p = 0.447	213.05 MWU: 13684.0 p = 0.001	216.76 MWU:14966.5 p = 0.040
	Previous use of TCMP	Yes	20	280.13	218.25	296.78	222.5	284.23	271.03
	No	426	220.84 MWU: 3127.5 p = 0.044	223.75 MWU: 4155.0 p = 0.851	220.06 MWU:2794.5 p = 0.006	223.55 MWU: 4240.0 p = 0.759	220.65 MWU: 3045.5 p = 0.019	221.27 MWU:3309.5 p = 0.091
Receiving TCMP training other than school.	Yes	8	286.69	165.81	258.06	250.44	276.31	257.06
	No	438	222.35 MWU: 1246.5 p = 0.161	224.55 MWU: 1290.5 p = 0.198	222.87 MWU:1475.5 p = 0.415	223.01 MWU: 1536.5 p = 0.000	222.54 MWU: 1329.5 p = 0.205	222.89 MWU:1483.5 p = 0.457
	TCMP training should be given at school.	Yes	327	231.14	231.61	224.65	223.18	233.39	232.78
	No	119	202.51 MWU: 14958.5 p = 0.038	201.22 MWU: 16805.5 p = 0.027	220.34 MWU:19081.0 p = 0.740	224.38 MWU: 119352.0 p = 0.453	196.32 MWU: 16222.5 p = 0.004	198.00 MWU:16422.0 p = 0.012
Patients should use TCMP.	Yes	212	127,56	128,96	123,84	124	127,72	128,04
	No	36	106,46 MWU: 3166.5 p = 0.102	98,26 MWU: 2871.5 p = 0.017	128,4 MWU:13675.5 p = 0.708	127,44 MWU: 3710.0 p = 0.015	105,53 MWU: 3133.0 p = 0.066	103,64 MWU:3065.0 p = 0.059
	Would you like to apply TCMP?	Yes	331	230.43	230.18	225.9	223.17	227.28	230.73
	No	115	203.56 MWU: 16739.0 p = 0.054	204.29 MWU: 16823.0 p = 0.062	216.58 MWU:18236.5 p = 0.477	224.44 MWU: 18924.0 p = 0.431	212.61 MWU: 17780.0 p = 0.254	202.7 MWU:16641.0 p = 0.044

KW: Kruskal Wallis; MWU: Mann Whitney U; TCMP: Traditional and complementary medicine practices; CAMAS: The Complementary and alternative medicine approaches scale.

had not heard of TCMP before, and 95.5 % stated that they had not used TCMP before. 98.2 % had not received information about TCMP from a physiotherapist or nurse, 89.7 % had not received TCMP training during their education, 98.2 % had not received TCMP training other than school, 73.3 % reported that TCMP training should be given at school, 47.5 % reported that TCMP should be used for patients, and 44.4 % had no idea about TCMP. 74.2 % wanted to apply TCMP, and 94.2 % did not know the regulations of the Ministry of Health.

The total mean score of CAMAS was 25,44 ± 8,953, with the highest mean score in the nutritional approach (13.61 ± 4.106) and the lowest in the biological approach (0.01 ± 0.15). The mean total score on the CACMAS was found to be 111,29 ± 16,092. The total score of both scales was found to be moderate. The highest mean score was in the sub-dimension of the holistic view of health (46.48 ± 8.665), and the lowest mean score was in the dissatisfaction with modern medicine (31,42 ± 9,66) (Table 1).

Table 2 shows a significant difference in the sub-dimensions of residential area and mental approach. Those living in the district had significantly higher scores than those living in the village or town (p = 0.027). Herbal approach (p = 0.001) and mental approach (p = 0.008) sub-dimension scores and total scores of the complementary and alternative medicine approach scale (p = 0.006) were significantly higher in smokers (p = 0.006). The religious approach score was considerably higher in teetotalers than in occasional users (p = 0.017). The mental approach score was significantly higher in occasional alcohol users than in frequent alcohol

Table 3

The CACMAS with some variables (N = 446).

		n	Intellectual view of complementary medicine Mean Rank	Dissatisfaction with modern medicine Mean Rank	Holistic view of health Mean Rank	CACMAS total Mean Rank
Gender	Female	337	224.02	216.15	231.63	223.13
	Male	109	217.84	246.22	198.37	220.57
			MWU:17749.5 p = 0.662	MWU:15890.5 p = 0.034	MWU:15627.5 p = 0.019	MWU:18047.5 p = 0.857
Department	Physiotherapy	161	223.62	244.87	193.04	220.58
	Nursing	285	221.86	211.43	240.71	223.59
			MWU:22601.0 p = 0.889	MWU:19502.5 p = 0.008	MWU:18038.0 p = 0.000	MWU:22472.5 p = 0.812
Class	1	114	232.03	225.23	206.14	219.62
	2	132	222.77	226.69	207.03	215.45
	3	103	201.11	214.36	239.52	215.16
	4	97	233.75	226.82	249.3	243.18
			KWX ² :4.242 p = 0.236	KWX ² :.685 p = 0.877	KWX ² :9.718 p = 0.021	KWX ² :3.311 p = 0.346
Place of residence	City	230	231.59	236.5	225.31	234.14
	District	144	205.19	202.42	212.78	195.68
	Village/Town	72	228.34	224.15	239.15	239.28
			KWX ² :3.922 p = 0.141	KWX ² :6.199 p = 0.045	KWX ² :2.106 p = 0.349	KWX ² :9.405 p = 0.009
Income status	Income less than expenditure	161	224.39	244.84	229.86	237.78
	Income equal to expenditure	234	216.73	212.89	215.76	210.29
	Income more than expenditure	51	242.93	204.82	238.93	230.32
			KWX ² :1.803 p = 0.406	KWX ² :7.077 p = 0.029	KWX ² :1.969 p = 0.374	KWX ² :4.569 p = 0.102
Hearing about the TCMP	Yes	100	231.04	201.04	237.22	224.03
	No	346	220.02	229.99	219.53	222.06
			MWU:16346.0 p = 0.449	MWU:15053.5 p = 0.048	MWU:15928.0 p = 0.226	MWU:17047.5 p = 0.893
Previous use of TCMP	Yes	20	281.18	225.55	221.54	273.18
	No	426	219.73	223.4	221.54	220.11
			MWU:3066.5 p = 0.036	MWU:4219.0 p = 0.942	MWU:3426.5 p = 0.139	MWU:3226.5 p = 0.071
Do you think TCMP training is necessary at school?	Yes	327	229.19	211.22	230.95	222.34
	No	119	204.23	257.26	203.03	222.95
			MWU:17163.5 p = 0.069	MWU:15439.5 p = 0.001	MWU:17021.0 p = 0.043	MWU:19284.5 p = 0.965
Do you think TCMP should be applied to patients?	Yes	212	126.23	118.76	127.98	123.5
	No	36	110.96	158.29	104.03	126.93
			MWU: 3328.5 p = 0.235	MWU:2599.5 p = 0.002	MWU:3079.0 p = 0.064	MWU:3692.5 p = 0.790
Would you like to apply TCMP?	Yes	331	230.96	212.45	233.07	225.11
	No	115	198.29	255.32	195.96	215.04
			MWU: 16133.0 p = 0.019	MWU:15373.5 p = 0.002	MWU:15865.0 p = 0.008	MWU:18060.0 p = 0.469

KW: Kruskal Wallis; MWU: Mann Whitney U; TCMP: Traditional and complementary medicine practices; CACMAS: The complementary, alternative and conventional medicine attitude scale.

users and teetotalers (p = 00.011). The herbal approach (p = 00.022), mental approach (p = 00.001), and scale total score (p = 00.040) were significantly higher in those who had heard of TCMP. Herbal approach (p = 00.044), religious approach (p = 00.006), and mental approach (p = 00.019) scores were significantly higher in those who had previously used TCMP. The biological approach score was considerably higher in those who received TCMP training other than school (p < 00.001). Herbal approach (p = 00.038), nutritional approach (p = 00.027), mental approach (p = 00.004), and total scale scores (p = 00.012) were significantly higher in those who thought that TCMP training should be given at school. The nutritional approach score was considerably higher in those who stated that patients should get TCMP (p = 00.017), and the biological approach score was significantly higher in those who indicated that they did not need TCMP (p = 00.015). The total score of the complementary and alternative medicine approaches scale was considerably higher for those who wanted to apply TCMP (p = 00.044).

Small in significant was found between the total score of the complementary and alternative medicine approaches scale and the mean scores of its sub-dimensions and gender, department, class, income status, chronic disease status, receiving TCMP information from a physiotherapist or nurse, receiving TCMP training, and knowing the Ministry of Health regulation.

According to Table 3, dissatisfaction with modern medicine was significantly higher in males (p = 00.034), and physiotherapy-

Table 4

Correlation analysis of age the CAMAS and CACMAS (N = 446).

		Herbal approach	Nutritional approach	Religious approach	Biological approach	Mental approach	CAMAS Total	Intellectual view of complementary medicine	Dissatisfaction with Modern medicine	Holistic view of health	CACMAS total
Age	r	−0.003	−0.033	0.003	0.004	0.143**	−0.002	−0.076	−0.005	0.039	−0.013
	p	0.949	0.488	0.945	0.937	0.002	0.962	0.107	0.910	0.416	0.786
Herbal approach	r	1	0.546**	0.257**	0.112*	0.354**	0.933**	0.158**	−0.017	0.037	0.087
	p	.	0.000	0.000	0.018	0.000	0.000	0.001	0.718	0.442	0.067
Nutritional approach	r	.	1	0.226**	0.007	0.230**	0.761**	0.098*	−0.052	−0.005	0.018
	p	.	.	0.000	0.878	0.000	0.000	0.038	0.273	0.910	0.709
Religious approach	r	.	.	1	0.061	0.205**	0.382**	0.115*	−0.039	0.081	0.058
	p	.	.	.	0.202	0.000	0.000	0.016	0.410	0.088	0.226
Biological approach	r	.	.	.	1	0.003	0.109*	0.047	0.004	0.036	0.043
	p	.	.	.	.	0.943	0.021	0.325	0.941	0.454	0.369
Mental approach	r	.	.	.	.	1	0.436**	0.118*	−0.086	0.159**	0.091
	p	.	.	.	.	.	0.000	0.013	0.069	0.001	0.054
CAMAS total	r	.	.	.	.	.	1	0.174**	−0.034	0.040	0.085
	p	.	.	.	.	.	.	0.000	0.480	0.401	0.074
Intellectual view of complementary medicine	r	.	.	.	.	.	.	1	0.127**	0.395**	0.752**
	p	.	.	.	.	.	.	.	0.008	0.000	0.000
Dissatisfaction with modern medicine	r	.	.	.	.	.	.	.	1	−0.252**	0.517**
	p	.	.	.	.	.	.	.	.	0.000	0.000
Holistic view of health	r	.	.	.	.	.	.	.	.	1	0.562**
	p	.	.	.	.	.	.	.	.	.	0.000

CACMAS: The complementary, alternative and conventional medicine attitude scale; CAMAS: The Complementary and alternative medicine approaches scale.

rehabilitation students ($p = 00.008$), and a holistic view of health was significantly higher in females ($p = 00.019$) and nursing students ($p = 00.000$). Holistic view of health attitude was considerably higher in fourth-year students than in first- and second-year students ($p = 00.021$). The scores in dissatisfaction with modern medicine attitude ($p = 00.045$) and CACMAS total ($p = 00.009$) were significantly higher for those living in the city center than those living in the district. Dissatisfaction with modern medicine was considerably higher in those with less income than expenditure than those with equal income ($p = 00.029$) and those who had not heard of TCMP ($p = 00.048$). The intellectual view of complementary medicine was significantly higher in those who had previously used TCMP ($p = 00.036$) and those who thought TCMP training was unnecessary at school ($p = 00.001$). In comparison, a holistic view of health was significantly higher in those who believed TCMP training was necessary ($p = 00.043$). Dissatisfaction with modern medicine was substantially higher in those who thought patients should not use TCMP ($p = 00.002$). Intellectual view of complementary medicine ($p = 00.019$) and holistic view of health ($p = 00.008$) scores were significantly higher in those who wanted to apply TCMP, and the dissatisfaction with modern medicine score was considerably higher in those who did not wish to use TCMP ($p = 00.002$).

Small in significant was found between the mean scores of the total and sub-dimensions scores of the traditional and complementary medicine attitude scale and chronic disease status, smoking and alcohol use status, receiving TCMP information from a physiotherapist or nurse, receiving TCMP training in or out of school, and knowing the Ministry of Health regulations.

The comparison of nursing and physiotherapy-rehabilitation students showed that nursing students (28.8 %) were significantly more likely to have heard about TCMP applications than physiotherapy-rehabilitation students (11.2 %) ($p < 00.001$). physiotherapy-rehabilitation students (80.1 %, 85.7 %) thought that TCMP training should be given at school and wanted to apply it more significantly than nursing students (69.5 %, 67.7 %) ($p = 00.015$, $p < 00.001$). Female students thought that TCMP training should be given at school and be used for patients, and they wanted to apply TCMP significantly more (77.2 %, 51 %, 81.6 %) than male students (61.5 %, 36.7 %, 51.4 %) ($p = 00.001$, $p < 00.001$, $p < 00.001$).

Correlation analysis showed a weak positive correlation ($r = -0.143$) between age and mental approach. There were weak positive correlations between the intellectual view of complementary medicine and the herbal approach ($r = 0.158$), nutritional approach ($r = 0.098$), religious approach ($r = 0.115$), mental approach ($r = 0.118$), and total score of the CACMAS ($r = 0.174$). A weak, significant positive correlation existed between the holistic view of health and the mental approach ($r = 0.159$). There was a soft, negative correlation between dissatisfaction with modern medicine and the holistic view of health ($r = -0.252$) and a significant positive correlation between the other sub-dimensions. Positive correlations were found between the sub-dimensions of the CAMAS scale (Table 4).

4. Discussion

This study, which examined the attitudes and level of use of physiotherapy-rehabilitation and nursing students about conventional and alternative medicine, revealed that students had not heard of the TCMP, did not apply it, and was not covered in their education. The students emphasized that TCMP training should be given at school and that they would like to use it for patients, but almost half of them had no idea whether it should be applied to patients. Likewise, it has been reported that surgical clinic nurses only have a basic understanding of TCMP techniques (cold-hot application, massage) [17], nurse interns prefer TCMP courses [38], and nursing students are open to using complementary medical techniques [33]. These findings indicate a tendency to implement TCMP among students and healthcare professionals, yet knowledge gaps exist. Almost no students had heard of the Ministry of Health's restrictions on traditional and complementary therapies, and students who wished to use traditional and complementary therapies scored much higher on the CAMAS overall, which is further data that lends credence to this belief. Despite students' limited knowledge about traditional and complementary medicine practices, they recognize these interventions as alternatives to modern medicine. Consequently, even though they may admit to lacking information and not currently applying these practices, they firmly believe these approaches should be integrated into the educational curriculum and utilized in patient care.

According to the results, most students in both departments were not informed about TCMP. In this study, it was discovered in another study that only 15.4 % of patients got information from healthcare professionals but found it insufficient, and nurses (78.3 %) did not think they were competent in delivering information on TCMP procedures [39]. In another study, nearly half of the patients did not receive adequate procedure information [18]. It was emphasized that medical students use the internet as a source of information about traditional and complementary medicine practices [40], which shows that information on the issue is not received from the staff. Even if it is, it cannot be provided sufficiently.

The most frequently used TCMP by nurses [39] and adults [2] are herbal products. In this study, the score for the complementary and alternative medicine approaches scale was moderate, and the most preferred approaches were nutritional and herbal, respectively. The herbal approach score was higher in those who had heard of and used TCMP before; the herbal and nutritional approach score was higher in those who thought that TCMP training should be given at school; and the nutritional approach score was higher in those who believed that the TCMP method should be used for patients. The fact that everyone can quickly get and use the products covered by the nutritional and herbal approaches may be why they are more popular. Additionally, the availability of these items in well-known locations like pharmacies may promote their utilization as a treatment-supporting factor. On the other hand, the biological approach was the least preferred and was significantly higher among those who thought that TCMP should not be used for patients. The fact that it is more difficult to access may have reduced its preferability, and those who believe it should not be used for patients may not have considered it a treatment method.

The mental approach was more prevalent in district residents than village or town residents, which may be because district residents had better access to and knowledge of the mental approach's content.

In the study, the use of herbal and mental approaches was found to be high among smokers. Some herbs, such as black cohosh, are

reported to be used to quit smoking or reduce the adverse effects of smoking [41]. In addition, mental approaches such as acupuncture are recommended to patients in internal units for smoking cessation [42]. The fact that society is aware of the effectiveness of these two smoking cessation techniques may have raised students' knowledge of them. Another finding of the study is that teetotalers have a greater level of religious approach. Concerning mental principles, this outcome is anticipated.

The literature suggests nurses' knowledge and attitudes toward traditional and complementary medicine can guide future educational interventions [43]. In the study, students' attitudes toward traditional and complementary medicine were moderate, and the highest score was found to be in the holistic view of the health sub-dimension. The intellectual view of the complementary medicine sub-dimension is more elevated in those who have heard and want to apply TCMP, supported by the correlation analysis. As a result of the study found a positive relationship between the intellectual approach to complementary medicine and TCMP, which are herbal, nutritional, religious, and mental approaches. These findings indicate that students generally hold positive attitudes toward traditional and complementary medicine and seem open to embracing various approaches with an increasingly informed perspective on complementary medicine.

Notably, the study identified a higher dissatisfaction with modern medicine among physiotherapy-rehabilitation students. However, they also strongly believed in the importance of including TCMP education in their curriculum and a greater desire to apply these practices in their future patient care than nursing students. This dissatisfaction with modern medicine among physiotherapy-rehabilitation students may drive their inclination toward exploring traditional and complementary medicine practices as an alternative or complementary approach to healthcare.

In addition, the holistic view of the health sub-dimension score was higher in senior students and those who thought that TCMP training should be given at school. As students approach graduation, it appears that they are developing a comprehensive perspective on patient care and treatment. They increasingly recognize the value of complementary medicine as a complement to modern medical approaches, suggesting a growing commitment to holistic healthcare practices. Therefore, adding a course on TCMP training to the curriculum would be advantageous, especially for senior students.

In this study, the rate of physiotherapy-rehabilitation students who thought that TCMP training should be provided at school was significantly higher. Literature has citations that cupping, massage, sponge, and acupuncture are mostly preferred against back and lower back pain in society [18,44], and physiotherapists use acupuncture for back and lower back pain [22,45], which is consistent with our study.

The correlation analysis showed that dissatisfaction with modern medicine decreased as the holistic view of health increased. Therefore, greater focus should be given to TCMP procedures to promote a holistic view of health further to reduce dissatisfaction with modern medicine. A positive relationship was found in all sub-dimensions of traditional and complementary medicine approaches, suggesting that using one strategy encourages using other methods. The study has certain limitations; it is limited only to the students of a university's nursing, physiotherapy-rehabilitation departments. Thus, it cannot be generalized to other departments of the university and broader society. The fact that the study did not include a question about the duties, authorities, and responsibilities of the relevant legislation of the Ministry of Health may also be a limitation. Therefore, studies examining the content of the Ministry of Health legislation can be included.

5. Conclusions

The study demonstrated that the students wanted to receive TCMP training and apply it to patients. Still, they were unaware of the Ministry of Health regulations and did not have enough exposure to TCMP training during their education. As students approached graduation, their holistic view of health increased. It is recommended that TCMP subjects be added to all health curricula, especially in the physiotherapy-rehabilitation and nursing departments, to increase student awareness of Ministry of Health regulations and their applicability in our nation and emphasize the existence of other approaches to awareness training besides nutritional and herbal approaches that are easy to use and compatible with our culture. Raising student awareness of TCMP is anticipated to promote the adoption of WHO-supported practices and have a positive long-term effect on society.

Ethics approval statement

This research was conducted per Helsinki's declaration and approved by the social and humanities ethics committee of the Recep Tayyip Erdogan University (2022\46, March 15, 2022). Burcu GENÇ KÖSE, Bahar KEFELİ ÇOL and Ayşe GÜMÜŞLER BAŞARAN contributed the conception and design of the study, acquisition of data, analysis and interpretation of data; drafting the article, revising it critically for important intellectual content, final approval of the version to be submitted. However the authors in the article were listed according to their contribution rates to the study.

Data availability statement

The authors do not have permission to share data.

Additional information

No additional information is available for this paper.

Funding information

This study was not been funded by any institution.

CRedit authorship contribution statement

Genç Köse Burcu: Writing – original draft, Visualization, Conceptualization. **Kefeli Çol Bahar:** Writing – original draft, Methodology. **Gümüşler Başaran Ayşe:** Writing – original draft, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- [1] A.D. Mwaka, G. Tusabe, C.O. Garimoi, S. Vohra, C. Ibingira, Integration of traditional and complementary medicine into medical school curricula: a survey among medical students in Makerere University, Uganda, *BMJ Open* 9 (2019) 1–10, <https://doi.org/10.1136/bmjopen-2019-030316>.
- [2] S.İ. Dursun, B. Vural, B. Keskin, H.K. Kaçar, A. Beyhan, H. Kadioğlu, Yetişkinlerde geleneksel/tamamlayıcı tıp uygulamaları ile sağlık okuryazarlığı ve sağlık algısı arasındaki ilişki, *Halk Sağlığı Hemşireliği Dergisi* 1 (2019) 1–10.
- [3] J. Kaur, N. Hamajima, E. Yamamoto, Y.M. Saw, T. Kariya, G.C. Soon, A. Amin, A.N. Halim, F.A. Aziz, S.H. Sharon, Patient satisfaction on the utilization of traditional and complementary medicine services at public hospitals in Malaysia, *Compl. Ther. Med.* 42 (2019) 422–428, <https://doi.org/10.1016/j.ctim.2018.12.013>.
- [4] I. Biçer, P.Y. Balçık, Traditional and complementary medicine: investigation of Turkey and the selected countries, *Hacettepe Journal of Health Adm.* 22 (1) (2019) 245–257.
- [5] T.C. Resmi Gazete, Geleneksel Ve Tamamlayıcı Tıp Uygulamaları Yönetmeliği, Sağlık Bakanlığı, Türkiye, 2014. <https://www.resmigazete.gov.tr/eskiler/2014/10/20141027-3.htm>.
- [6] T.C. Resmi Gazete, Hemşirelik Yönetmeliği, Sağlık Bakanlığı, Türkiye, 2010. <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=13830&MevzuatTur=7&MevzuatTertip=5>.
- [7] A. Sarman, Y. Uzuntarla, Attitudes of healthcare workers towards complementary and alternative medicine practices: a cross-sectional study in Turkey, *European Journal of Integrative Medicine* 49 (2022) 1–6, <https://doi.org/10.1016/j.eujim.2021.102096>.
- [8] K.N. Kılıç, P. Soylar, Investigation of attitudes, reasons and satisfaction levels of individuals who apply to traditional and complementary medicine practices, *Journal of Traditional Medical Complementary Therapies* 2 (3) (2019) 97–105. <https://doi.org/10.5336/jtracom.2019-71531>.
- [9] L. Tack, T. Lefebvre, V. Blicke, L. Cool, H. Pottel, K. Van Eygen, S. Derijcke, P. Vergauwe, P. Schofield, R. Chandler, P. Lane, T. Boterberg, P.R. Debruyne, Acupuncture as a complementary therapy for cancer care: acceptability and preferences of patients and informal caregivers, *JAMS Journal of Acupuncture and Meridian Studies* 14 (2021) 67–74, <https://doi.org/10.51507/j.jams.2021.14.2.67>.
- [10] A. Amalia, F. Luukmanto, Randomized control trial complementary therapy garlic capsules in hypertension patients, *Jurnal Ilmu Kesehatan* 9 (2021) 151–161, <https://doi.org/10.30650/jik.v9i2.2285>.
- [11] H.A. Razzaq, M.S. Hasan, M.F. Al-Dhalemy, W.M. Al-Silaykhee, H.B. Alhmadi, Z.A. Majeed, Utilization of ozone as a complementary therapy for covid-19 patients, *Int. J. Psychosoc. Rehabil.* 24 (2020) 10577–10588, <https://doi.org/10.37200/IJPR/V24I7/PR271061>.
- [12] D.S. Lensy, I.M. Ulfa, E.I. Kabuhung, Efforts to increase milk production in breastfeeding mothers using complementary therapy: literatur review, in: *International Conference on Health and Science*, 2021, 1, <https://ocs.unism.ac.id/index.php/ICoHS/article/view/325>.
- [13] J. Coles, C3 non-pharmacological acute pain control utilizing nurse-led aromatherapy in coronary bypass graft patients: a pilot study, *Pain Manag. Nurs.* 20 (2019) 101, <https://doi.org/10.1016/j.pmn.2018.11.041>.
- [14] B. Şimşek, D.Y. Aksoy, N.C. Basaran, D. Taş, D. Albasan, M.Z. Kalaycı, Mapping traditional and complementary medicine in Turkey, *European Journal of Integrative Medicine* 15 (2017) 68–72, <https://doi.org/10.1016/j.eujim.2017.09.006>.
- [15] Z. Canlı Özer, Boz, S. Turan Kavradım, G. Teskereci, European Union Project 'BestCARE': improving nursing care with best complementary therapy strategies, *Int. Nurs. Rev.* 66 (2019) 112–121, <https://doi.org/10.1111/inr.12469>.
- [16] L.M. Koh, B. Percival, T. Pauley, S. Pathak, Complementary therapy and alternative medicine: effects on induction of labour and pregnancy outcome in low risk post-dates women, *Heliyon* 5 (2019) e02787, <https://doi.org/10.1016/j.heliyon.2019.e02787>.
- [17] Ö. Uraz, U. Günay, Cerrahi kliniklerde çalışan hemşirelerin ameliyat sonrası sık görülen semptomlara yönelik tamamlayıcı ve alternatif yöntemlere ilişkin bilgi ve uygulamaları, *Yöbu Sağlık Bilimleri Fakültesi Dergisi* 1 (2020) 1–10.
- [18] S. Aydil, Ç. Arifoğlu Karaman, O. Küçükkaş, Evaluation of the awareness of patients who apply to physical medicine and rehabilitation outpatient clinic with pain about traditional and complementary medical practices: descriptive and cross-sectional research, *Journal of Traditional Medical Complementary Therapies* 4 (2021) 227–237, <https://doi.org/10.5336/jtracom.2021-82248>.
- [19] C. Algun, D. Tülin, Türkiye'de fizyoterapistlik mesleği, *SD (Sağlık Düşüncesi ve Tıp Kültürü) Dergisi*, 2019, pp. 56–59, 49.
- [20] M. Teut, A. Ullmann, M. Ortiz, G. Rotter, S. Binting, M. Cree, F. Lotz, S. Roll, B. Brinkhaus, Pulsatile dry cupping in chronic low back pain - a randomized three-armed controlled clinical trial, *BMC Compl. Alternative Med.* 18 (2018) 1–9, <https://doi.org/10.1186/s12906-018-2187-8>.
- [21] D.P. Artioli, A.L. de F. Tavares, G.R.F. Bertolini, Auriculotherapy: neurophysiology, points to choose, indications and results on musculoskeletal pain conditions: a systematic review of reviews, *Brazilian Journal of Pain* 2 (2019) 356–361, <https://doi.org/10.5935/2595-0118.20190065>.
- [22] L. Liu, J. Tarbotton, K. Martin, T. Haenga, S. Wu, G. David Baxter, Complementary and alternative medicine: a pilot survey of current clinical practice and attitudes of physiotherapists in the Otago region of New Zealand, *N. Z. J. Physiother.* 48 (2020) 127–137, <https://doi.org/10.15619/NZJP/48.3.04>.
- [23] M.M. Aman, R. Jason Yong, A.D. Kaye, R.D. Urman, Evidence-based non-pharmacological therapies for fibromyalgia, *Curr. Pain Headache Rep.* 22 (2018) 33, <https://doi.org/10.1007/s11916-018-0688-2>.
- [24] Z. Stroe, S. Axelerad, D. Axelerad, Melotherapy- a complementary approach in the symptomatology of multiple sclerosis patients, *Journal of Complementary Medicine Research* 11 (2020) 164, <https://doi.org/10.5455/jcmr.2020.11.01.19>.
- [25] M.S. Torlak, B. Ata, Effect of salat activity on knee pain, range of motion and muscle strength after total knee arthroplasty: a single-blinded randomized controlled trial, *International Journal of Traditional and Complementary Medicine Research* 3 (2022) 25–31, <https://doi.org/10.53811/ijtcmr.1054467>.
- [26] Z. Özer, S. Akbal Ateş, Geleneksel ve tamamlayıcı tıp uygulamalarının gülen yüzü: kahkaha yogası, *Journal of Anatolia Nursing and Health Sciences* 24 (2021) 108–116, <https://doi.org/10.17049/ataunihem.500301>.
- [27] M. Amsavahini, *Disseratation on a Study to Assess the Effectiveness of Psychiatric Nurse Initiated Complementary Therapy on Stress and Sleep Deprivation Among Depressive Clients Attending Outpatient Department at Psychiatric Tertiary Care Centre, Chennai, THE TAMIL NADU DR.M.G.R.MEDICAL UNIVERSITY, 2020.*
- [28] A. Balouchi, G. Mahmoudirad, M. Hastings-Tolsma, S.A. Shorofi, H. Shahdadi, A. Abdollahimohammad, Knowledge, attitude and use of complementary and alternative medicine among nurses: a systematic review, *Compl. Ther. Clin. Pract.* 31 (2018) 146–157, <https://doi.org/10.1016/j.ctcp.2018.02.008>.

- [29] M.G. Sayler, C.E. Domian Ommen, B.J. McKimmy, K.A. Smith, Is it feasible? A quality improvement project to integrate complementary therapy into a pain management program on a transitional care unit, *Journal of Doctoral Nursing Practice* 15 (2022) 46–56, <https://doi.org/10.1891/JDNP-D-20-00037>.
- [30] M. Zeighami, S. Soltani-Nejad, Knowledge, attitude, and practice of complementary and alternative medicine: a survey of Iranian nurses, *J. Res. Nurs.* 25 (4) (2020) 380–388. <https://doi.org/10.1177/1744987120925852>.
- [31] M. Kavurmaci, M. Tan, Z. Kavurmaci, Nursing, midwifery, and dietetics students' attitudes to complementary and integrative medicine and their applications, *Medical Journal of Bakirkoy* 14 (2018) 300–306, <https://doi.org/10.5350/BTDMJB.20170606124143>.
- [32] H. Hall, C. Brosnan, J. Frawley, J. Wardle, M. Collins, M. Leach, Nurses' communication regarding patients' use of complementary and alternative medicine, *Collegian* 25 (2018) 285–291, <https://doi.org/10.1016/j.colegn.2017.09.001>.
- [33] E.V. Kinchen, V. Loerzel, Nursing students' attitudes and use of holistic therapies for stress relief, *J. Holist. Nurs.* 37 (2019) 6–17, <https://doi.org/10.1177/0898010118761910>.
- [34] A. Kutt, M. Mayan, I. Bienko, J. Davies, An undergraduate course combining interprofessional education and complementary health approaches learning objectives: successful integrative learning that improves interest and reduces redundancy, *Explore* 15 (4) (2019) 273–282, <https://doi.org/10.1016/j.explore.2019.02.002>.
- [35] G. Can, O. Erol, A. Aydinler, E. Topuz, Quality of life and complementary and alternative medicine use among cancer patients in Turkey, *Eur. J. Oncol. Nurs.* 13 (2009) 287–294, <https://doi.org/10.1016/j.ejon.2009.03.007>.
- [36] K.L. McFadden, T.D. Hernandez, T.A. Ito, Attitudes toward complementary and alternative medicine influence its use, *Explore* 6 (6) (2010) 380–388, <https://doi.org/10.1016/j.explore.2010.08.004>.
- [37] E. Köse, H.Ç. Ekerbiçer, Ü. Erkorkmaz, Complementary, alternative and conventional medicine attitude scale: Turkish validity reliability study, *Sakarya Tıp Dergisi*. 8 (4) (2018) 726–736, <https://doi.org/10.31832/smj.478148>.
- [38] N. Baltacı, E. Koç, İntörn hemşirelik ve ebelik öğrencilerinin tamamlayıcı ve alternatif Tıbbaya yönelik bilgisi, Kullanımı Ve Tutumları, *Samsun Sağlık Bil. Der.* 3 (2018) 10–16.
- [39] F.Ü. Toprak, N. Uysal, A.Ş. Erenel, S. Kutlutürkan, Onkoloji hemşireleri, kanser hastaları ve hasta yakınlarının tamamlayıcı - alternatif tedavi yöntemlerine ilişkin uygulama ve tutumlarının belirlenmesi determination of practices and attitudes of oncology nurses, *Cancer Patients and Patient Relatives Ab* (2019) 6–7.
- [40] A. Ayraller, O. Öztürk, M. Ali Oruç, E. Yavuz, H. bir çıkar çatışması yoktur, Tıp fakültesi öğrencilerinin geleneksel ve tamamlayıcı tıp hakkındaki bilgi düzeyleri ve görüşleri, *Türk Aile Hek Derg* 24 (2020) 196–202, <https://doi.org/10.15511/tahd>.
- [41] H. Akan, Y.B. Sade, Kâhta (adıyaman) merkezi ve narince köyü 'nün etnobotanik açıdan araştırılması, *BEÜ Fen Bilimleri Dergisi* 4 (2015) 219–248.
- [42] D. Çadırıcı, Y. Ayazöz, B. Er, E. Oturakçioğlu, Kadir Çelik, Tıp fakültesi dahili bilimler asistanlarının sigara bıraktırma tedavisi hakkında bilgileri ve tutumları, *Türk Aile Hek Derg* 24 (2020) 138–145, <https://doi.org/10.15511/tahd.20.00338>.
- [43] N.J. Brewer, S.L. Turrisi, Y.S. Kim-Godwin, R.S. Pond, Nurses' knowledge and treatment beliefs: use of complementary and alternative medicine for pain management, *J. Holist. Nurs.* 37 (2019) 248–259, <https://doi.org/10.1177/0898010118822212>.
- [44] Ö.K. Odabaş, E. Ağadayı, Knowledge and behaviors of patients applying to family medicine clinic about traditional and complementary medicine, *Turkish Journal of Family Medicine and Primary Care* 15 (2021) 121–128, <https://doi.org/10.21763/tjfm.788871>.
- [45] L. Liu, Y. Tang, G.D. Baxter, H. Yin, S. Tumilty, Complementary and alternative medicine - practice, attitudes, and knowledge among healthcare professionals in New Zealand: an integrative review, *BMC Complementary Medicine and Therapies* 21 (2021) 1–11, <https://doi.org/10.1186/s12906-021-03235-z>.