European Journal of Environment and Public Health
2022, 6(2), em0115
e-ISSN: 2542-4904
https://www.ejeph.com

Review Article

Knowledge, Attitudes, and Opinions of Health Professionals and Students on Traditional and Complementary Medicine Practices in Turkey: A Systematic Review and Meta-Analysis

Mustafa Tozun [1*], Hazal Kucukkefe Bag [1], Merve Pektas [1], Ece Soyacikgoz [1], Mustafa Agah Tekindal [2]

[1] Department of Public Health, Medical Faculty, Izmir Katip Celebi University, Izmir, TURKEY
[2] Department of Biostatistics, Medical Faculty, Izmir Katip Celebi University, Izmir, TURKEY
***Corresponding Author:** mtzn76@gmail.com

Citation: Tozun, M., Kucukkefe Bag, H., Pektas, M., Soyacikgoz, E. and Tekindal, M. A. (2022). Knowledge, Attitudes, and Opinions of Health Professionals and Students on Traditional and Complementary Medicine Practices in Turkey: A Systematic Review and Meta-Analysis. *European Journal of Environment and Public Health*, 6(2), em0115. https://doi.org/10.21601/ejeph/12186

ARTICLE INFO

Received: 8 May 2022

Accepted: 15 Jun. 2022

ABSTRACT

Objective: To perform a systematic compilation and meta-analysis of research on the knowledge, attitudes, and opinions of health professionals and students on traditional and complementary medicine (TCM) practices in Turkey.

Methods: This study is a systematic review and meta-analysis study. The literature review on the subject of the research was carried out between February 25 and March 8, 2022. A search was made on Google Scholar in Turkish and English with appropriate keywords for 2000 and later.

Results: A total of 43 studies were identified that met the acceptance criteria. The first three lines of TCM implementations used are, as follows: (i) massage, (ii) herbal therapy, and (iii) acupuncture. The first three lines for the most well-known TCM implementations are, as follows: (i) acupuncture, (ii) herbal therapy, and (iii) massage. The prevalence of the opinion as "TCM should be included in the curriculum of medical and health schools" ranged from 36.7% to 90.4%. The prevalence of the opinion of "It should be applied by evaluating their effectiveness with controlled studies" was between 34.4% and 95.7%. The prevalence of meta-analysis for training on TCM was found to be 21% (95% CI: 14%-29%). The meta-analysis prevalence of participants using any TCM implementation was 45% (95% CI: 37%-54%). The meta-analysis prevalence of knowing TCM implementations was found to be 66% (95% CI: 56%-75%).

Conclusion: There is increasing interest in TCM and concerns remain due to the lack of evidence-based studies. The frequency of negative thinking in physicians is higher than that of other healthcare personnel. However, in general, positive opinions about TCM were found to be dominant over negative opinions. The demand for TCM training and including TCM in school curricula is striking.

Keywords: traditional and complementary medicine, health personnel, attitude, opinion, Turkey

INTRODUCTION

In the definition of traditional medicine, the World Health Organization (WHO) emphasized "based on theory, belief and experience" and "the sum of knowledge, skills, and practices used in the prevention, diagnosis, healing, or treatment". According to this definition, traditional medicine practice does not have to be explainable. WHO uses the terms "complementary medicine" and "alternative medicine" interchangeably. According to the definition, complementary medicine is health care practices that are not part of a country's traditional medicine practices and are not part of conventional medicine (WHO, 2022). Although the term "alternative medicine" is used in different countries, this term was not preferred in the legal regulation in Turkey. "Traditional and complementary medicine practices regulation" was issued in Turkey in 2014 (Official Gazette of the Republic of Turkey, 2014).

In a systematic review by Frass et al. (2012), it was reported that the use of traditional and complementary medicine (TCM) has increased since 1950 in the USA and around the world, and it is also said that there is a positive approach to TCM in the general population. In the USA, it was reported that 28.9% of

This study was presented as a poster at the Integrative and Anatolian Medicine Congress, held in Bursa, Turkey, on May 13-15, 2022.

the general population used at least one TCM practice in 1999 (Barnes et al., 2002).

Various societies have developed different local healing methods that are covered under the broad concept of TCM. African, Chinese, and Indian traditional medicines and methods can be given as examples. In fact, although the term alternative medicine is used for TCM, conventional medicine (or modern medicine) has become new and alternative to these practices with ancient roots. While discussing African traditional medicine in his study, Abdullahi (2011) emphasizes that before the colonial period, TCM was the dominant medical system available to millions of people in Africa. In fact, TCM was the sole source of medical care for a larger proportion of the population in Africa. Colonialism and Western religion and education and the phenomenon of globalization have negatively affected the perception of TCM in Africa, often among the educated elite. Despite this, the demand for and use of TCM implementations continues to increase not only in Africa but in fact all over the world. Therefore, TCM practitioners play an important role in the treatment process, especially in developing countries.

Traditional Chinese medicine, which is one of the basic elements of traditional medicine, has 3,000 years of roots. According to the official sources of the People's Republic of China, traditional Chinese medicine and pharmacology education is given in 34 higher education institutions throughout the country in 2003. Every medical school that teaches Western medicine has at least one traditional Chinese medicine chair. Today, traditional Chinese medicine is also known and practiced in Europe, North America, and Turkey (Ekmekci, 2018).

Ayurveda is a practice of Indian medicine. It dates back to the 2nd century. The foundations of ayurveda were laid by the ancient schools of Hindu philosophical teachings called *Vaisheshika* and the school of logic called *Nyaya*. In *"Charaka Samhita"* all aspects of ayurvedic medicine are described and *"Sushruta Samhita"* is a resource that defines the science of surgery (Jaiswal and Williams, 2017).

In fact, TCM implementations can be traced back to prehistoric times. According to the fossil record, the use of plants as medicine can be traced back at least 60,000 years. TCM, which covers various implementations in various cultures around the world, as seen in the examples of China, India, and Africa, is turning into a large industry today. In 2012, the total value of the TCM industry was equivalent to about one-third of the total of China's pharmaceutical industry (Yuan et al., 2016). The share of traditional medicines in total consumption in Japan has reached up to 83%. However, scientific evidence for TCM is still insufficient. Many practitioners of Western medical science consider such TCM practices to lack credibility. Today, China, the USA, North Korea, India, Japan, Australia, Germany, Norway, Canada, Cuba, and Italy are among the countries that carry out national policies and prepare regulations on TCM. Turkey has been among these countries since 2014. In these countries, the practice is legally limited to physicians and there are hospitals that practice TCM (Bicer and Balcik, 2019).

As in the world, there are deficiencies in terms of legal basis and ethical dimension of TCM practices in Turkey. Arpaci (2021), in his determinations on the practices in Turkey, mentioned that the emergence of legal responsibility for the doctor is more likely in TCM implementations than in conventional medicine. Informed consent comes first among other ethical issues. The prevailing opinions in the treatment phase; first of all, it is the implementation of standard treatment in accordance with conventional medicine. TCM may be considered if standard treatment is not available. If there is the standard treatment, if the physician is a TCM practitioner, he or she may prefer TCM within the scope of "freedom of choice of treatment" and this will not be against the law. However, the treatment needs to be justified and explained to the patient in detail. It is not expected for the physician who applies only conventional medicine to know the TCM implementation that can be applied in that disease and to inform the patient. However, the TCM practitioner physician should also know and explain the treatments offered by conventional medicine while applying the TCM treatment. In the Regulation about TCM that Turkey issued in 2014, it is seen that there is inadequacy in these matters.

As can be seen, it is thought that the inadequacies in the legal and ethical dimensions of TCM practices and in evidence-based scientific research affect the positive approach to TCM in terms of physicians and health personnel.

For this reason, we examined the studies conducted in Turkey on the views and attitudes of health professionals and students on TCM, their level of use, and knowledge. In the literature, we saw that after 2000, the literature on the subject in Turkey had not been systematically reviewed and meta-analyzed before.

The aim of this study was to perform a systematic compilation and meta-analysis of research on the knowledge, attitudes, and opinions of health professionals and students on traditional and complementary medicine (TCM) practices in Turkey.

MATERIAL AND METHOD

This study is a systematic review and meta-analysis study.

Search Strategy

The literature review on the research topic was carried out between February 25 and March 8, 2022. Searching for studies conducted in Turkish on Google Scholar was made by typing "*Geleneksel ve Tamamlayici Tip VEYA Tamamlayici ve Alternatif Tip VE Hekim VEYA Ogrenci VE Gorus VEYA Bilgi VEYA Tutum VEYA Davranis"* and selecting the year 2000 and later.

Then, search for studies written in English on Google Scholar by typing *"Traditional and Complementary Medicine" OR "Complementary and Alternative Medicine" AND "Physician OR Student" AND "View OR Knowledge OR Attitude OR Behavior" AND "in Turkey"* and the year 2000 and after was selected.

In order to reach Turkish resources, the Google Scholar database was preferred.

Inclusion criteria

1. Cross-sectional studies,

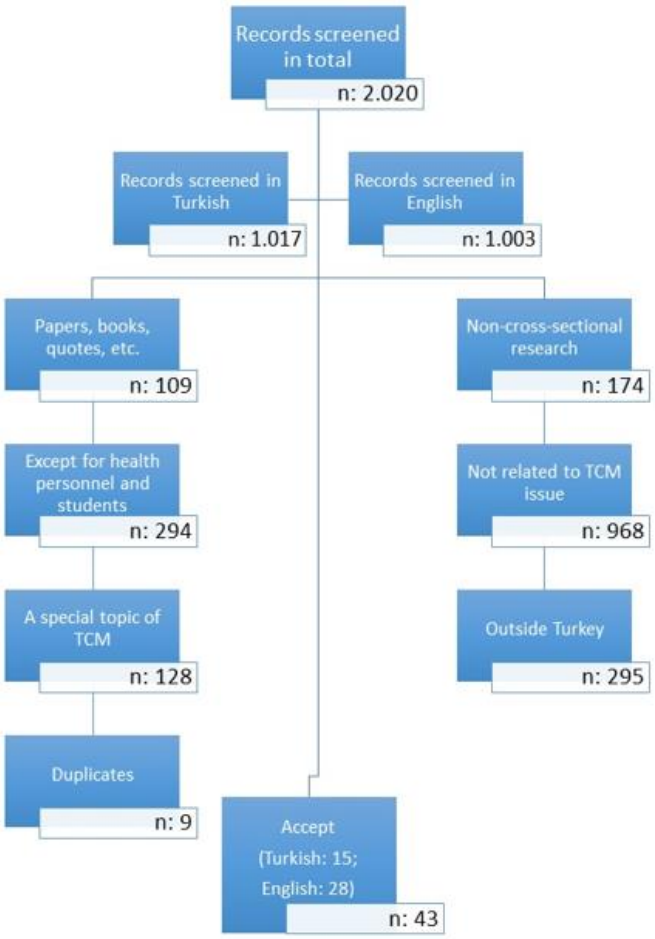

Figure 1. PRISMA flow diagram

2. Being a thesis study,
3. Being carried out on physicians, dentists, medical or other health school students,
4. Being a study in the field of TCM that informs opinion, knowledge, attitude, and behavior,
5. Being a study carried out in Turkey, and
6. Being one of the studies published in 2000 and later.

Exclusion criteria

1. Non-cross-sectional studies (reviews, prospective, retrospective, experimental, intervention, etc.),
2. Congress proceedings, books, e-books, news, citations, etc.,
3. On physicians, dentists, medical, or other health school students not been carried out,
4. Not to be a study expressing opinions, knowledge, attitudes, and behaviors in the field of TCM,
5. Being a study that in a country other than Turkey,
6. To be one of the studies published before 2000,
7. Being a study on a specific implementation of TCM that does not deal with the general, and
8. Duplication.

Flow Diagram

A total of 2,020 records were reached, 1,017 with the Turkish search findings and 1,003 with the English search findings on Google Scholar.

According to the exclusion/inclusion criteria

A flowchart has been prepared in accordance with the preferred reporting items for systematic reviews and meta-analyses (PRISMA) (Moher et al., 2015) and the PRISMA flow diagram is presented in **Figure 1**.

Out of total of 2,020 articles written in Turkish and English,

1. 174 non-cross-sectional studies (reviews, prospective, retrospective, experimental, intervention, etc.),
2. 109 congress papers, e-books, news, citations, etc.,
3. 294 of them were not carried out on physicians, dentists or medical or other health school students,
4. 968 of them were not a study that reported opinions, knowledge, attitudes, and behaviors in the field of TCM,
5. 128 of them were not TCM in general, is a study dealing with a specific implementation,
6. Being a study, 295 of which were conducted in a country other than Turkey, and
7. Nine records were eliminated because they were duplications.

Thus, a total of 1,977 records were eliminated. A total of 43 publications were included in the study.

Data Acquisition and Evaluation

The researchers independently reviewed the literature review against predefined exclusion and inclusion criteria. Afterward, the disagreements were discussed. The data has been finalized. A total of 43 studies were identified that met the acceptance criteria. 28 of them were in English and 15 of them were in Turkish. The oldest published article was from 2004. Five of the studies were dissertations and 38 were cross-sectional research articles. A questionnaire form developed by the researchers was used in 34 of the studies. In the remaining studies, it was seen that another scale was used other than the questionnaire form. The descriptive features of the studies that met the acceptance criteria are presented in **Table 1**, n is number of participants.

Ethical Aspect of Research

In order not to miss the articles that should be included in the literature review, the researchers worked together and made a literature review and the records were finalized by consensus. Ethics Committee approval was not received because it was a systematic review and meta-analysis study.

Definitions and Procedures

The articles accepted for the systematic review were examined and the information presented on using TCM, knowing, and opinion were collected in an excel file. New data were also derived from the findings presented in the studies. For example, if the number of participants and the frequency of users (percentage) were reported, the number of users was calculated.

Table 1. Descriptive characteristics of studies that meet the acceptance criteria

Author(s)	n	Language	Thesis/ original article	Place of research	Who are the participants?	Data collection tool	Data collection method
Uzun and Tan (2004)	276	English	Original article	Nursing school of a university, Erzurum	Nursing student	Questionnaire form	Self-filling
Koksoy (2008)	516	Turkish	Thesis	University and state hospital, Mersin	Doctor, nurse, midwife	Questionnaire form	Face to face meeting
Kilic et al. (2009)	401	English	Original article	A military medical faculty, Ankara	Military medical faculty students	Questionnaire form	Self-filling
Yildirim et al. (2010)	972	English	Original article	Faculty of nursing and medicine of a university	Medical and nursing students	Questionnaire form	Self-filling
Akan et al. (2012)	943	English	Original article	Seven medical faculties	Medical students	Questionnaire form	Self-filling
Koc et al. (2012)	129	English	Original article	Family health centers, Samsun	Midwives	Questionnaire form	Self-filling
Camurdan and Gul (2013)	371	English	Original article	A faculty of health, Istanbul	Nursing & midwifery students	Questionnaire form	Self-filling
Yurtseven et al. (2015)	729	English	Original article	A faculty of medicine, Istanbul	Medical students	Questionnaire form	Self-filling
Demirbag et al. (2015)	59	English	Original article	Family health centers, Trabzon	Midwives	Holistic complementary and alternative medicines questionnaire	Self-filling
Doganay and Tanyeli (2017)	710	English	Original article	Vocational school of health and faculty of medicine, Sakarya and Erzurum	Medical and health vocational school students	Questionnaire form	Self-filling
Gorucu (2018)	300	Turkish	Thesis	Three education research hospitals, Istanbul	Nurses	Personal information form	Face to face meeting
Doganay (2018)	637	English	Original article	Vocational school of health and faculty of medicine, Sakarya and Erzurum	Medical and health vocational school students	Questionnaire form	Self-filling
Metin et al. (2018)	127	English	Original article	Ankara	Oncology nurses	Questionnaire form	Self-filling
Baltaci and Koc (2018)	120	English	Original article	A faculty of health sciences, Samsun	Nursing and midwife students	Holistic complementary and alternative medicines questionnaire	Self-filling
Kavurmaci et al. (2018)	671	English	Original article	Faculty of Health Sciences, Erzurum	Nursing, midwifery, and dietetics students	Questionnaire form	Self-filling
Pirincci et al. (2018)	489	English	Original article	Faculty of Health Sciences, Elazig	Nursing students	Questionnaire form	Self-filling
Ilhan et al. (2019)	264	Turkish	Original article	Vocational School of Health Services, Cankiri	Health services vocational school students	Questionnaire form	Self-filling
Demir (2019)	284	Turkish	Thesis	Two state hospitals, Istanbul	Physician, nurse, midwife, health officer, and other health personnel	Data information form & attitudes towards integrative complementary & alternative medicine	Self-filling
Agan (2019)	770	Turkish	Thesis	Faculty of health sciences of a state university, Istanbul	Faculty of health sciences students	Diagnostic form and attitude scale towards complementary, alternative and modern medicine	Self-filling
Altinbas and Ister (2019)	471	Turkish	Original article	A health college, Southeastern Anatolia Region	Midwifery and nursing students	Questionnaire form	Self-filling
Sarman and Uzuntarla (2022)	794	English	Original article	Two public hospitals, Ankara and Bingol	Health workers	Holistic complementary and alternative medicines questionnaire	Online

Table 1 (Continued). Descriptive characteristics of studies that meet the acceptance criteria

Author(s)	n	Language	Thesis/ original article	Place of research	Who are the participants?	Data collection tool	Data collection method
Ozgunay and Ozcengiz (2019)	462	Turkish	Original article	Members of Turkish Anesthesiology and Reanimation Association, Turkey in general	Anesthesia lecturers, specialist doctors, and research assistants working throughout Turkey	Questionnaire form	Online
Ozyildirim et al. (2019)	513	English	Original article	A faculty of medicine, Istanbul	Medical faculty students	Questionnaire form	Online and face to face
Ayraler et al. (2019)	260	English	Original article	A medical school	Medical faculty non-academic staff	Questionnaire form	Self-filling
Solmaz and Altay (2019)	190	Turkish	Original article	Department of Health Management	Health management department students	Questionnaire form	Face to face meeting
Basatemur et al. (2020)	299	Turkish	Original article	A faculty of medicine, Malatya	Medical faculty students	Questionnaire form	Self-filling
Karahan et al. (2020)	320	English	Original article	A faculty of medicine, Sivas	Medical faculty students	Questionnaire form	Online
Samanci et al. (2020)	50	English	Original article	A faculty of medicine, Duzce	Doctors	Questionnaire form	Face to face meeting
Yilmaz et al. (2020)	736	English	Original article	A faculty of health sciences, Izmir	Nursing, physiotherapy and rehabilitation department and nutrition and dietetics students	Questionnaire form, health news perception scale, and attitude scale to use complementary therapies	Self-filling
Demir-dora et al. (2020)	188	English	Original article	A faculty of medicine, Antalya	Medical faculty students	Questionnaire form	Online
Yigitbas and Bulut (2020)	1158	English	Original article	Two universities, Eastern Black Sea and Eastern Anatolia	Health school students	Questionnaire form	No information
Ege et al. (2020)	243	Turkish	Original article	Faculty of Dentistry, Adiyaman	Dental students	Questionnaire form	Self-filling
Senol et al. (2020)	680	Turkish	Original article	A faculty of medicine, Afyonkarahisar	Medical faculty students	Questionnaire form	Self-filling
Ates and Gungor (2021)	216	Turkish	Original article	A training and research hospital, Ankara	Pediatricians	Questionnaire form	Face to face meeting
Gunduz (2021)	256	Turkish	Thesis	A faculty of medicine, Denizli	Assistant physicians	Questionnaire form	Face to face meeting
Ikiisik et al. (2021)	327	Turkish	Original article	A training and research hospital, İstanbul	Assistant physicians	Questionnaire form	Self-filling
Ozsaker (2021)	224	English	Original article	A faculty of nursing, Izmir	Nursing students	Student identification form and attitudes towards integrative complementary and alternative medicine scale	Self-filling
Hazer et al. (2021)	150	English	Original article	Turkey	Psychiatrists	Questionnaire form	Online
Kaya et al. (2021)	166	English	Original article	A medical faculty, Duzce	Medical faculty students	Questionnaire form	Online
Tekin et al. (2021)	130	English	Original article	A training and research hospital, Ankara	Physicians	Questionnaire form, complementary, alternative and conventional medicine attitude scale Turkish version	Face to face meeting
Ozyildirim et al. (2021)	194	English	Original article	Faculty of Health Sciences, Samsun	Faculty of health sciences students	Questionnaire form	Self-filling
Sahin et al. (2021)	264	English	Original article	Health High School, Rize	Health high school students	Questionnaire form	Face to face meeting
Yayan and Suna Dag (2019)	237	Turkish	Original article	Pediatric clinics, Malatya	Nurses	Questionnaire form	Face to face meeting

Since different questionnaires and scales were used in the studies, the answers to different questions with the same meaning were gathered in one group. Those using any TCM implementation were included in the TCM use prevalence."Knows TCM implementations at an intermediate or higher level" or "knows or knows well", etc. the answers given were included in the TCM knowledge prevalence.

In studies; a scoring was applied to the implementations in the first three places for using, knowing, and information source. The third place is given one point, the second place is given two points and the first place is given three points. Thus, scores and information sources scores were calculated for the most widely used and known TCM implementations.

If the prevalence of using or knowing TCM was not specified in the studies, but the prevalence was reported for the first rank implementation, this data was accepted as the prevalence of using or knowing.

Prevalence values of the meta-analysis were calculated for using, knowing, and training on TCM.

Opinions on TCM are presented in three groups, as follows:

1. Studies only on physicians and medical students,
2. Studies only on other healthcare personnel and non-medical healthcare students, and
3. studies involving "doctors and healthcare personnel" and "medical students and other healthcare students" together.

Meta-Analytical Methods

Egger's linear regression test was used to determine whether the study effect sizes and standard errors of the studies included in the meta-analysis were linear. In order to eliminate the publication bias, the common exposure value was recalculated by applying the trim and fill method of Duval and Tweedie (2000). The random-effects model (Paule-Mandel method) was used to determine the variance between studies as well as within-study variance. Cochrane's Q statistics with degrees of freedom were used to evaluate the heterogeneity of the effect sizes of the studies (k-1), the I^2 statistics to determine the level of heterogeneity, and the τ^2 statistics to determine the true variance between studies. I^2 value, Patsopoulos et al. (2008) suggested using three categories (low heterogeneity below 25%, medium heterogeneity between 25-50%, and high heterogeneity above 50%). In our study, the I^2 value was determined to be over 50%. There is a high level of bias in our study.

According to the publication bias summary statistics table, as a result of the heterogeneity test, the meta-analysis of the study included in the study was found to be heterogeneous because the p-value was less than 0.05 and the Q value was greater than the value corresponding to the *df* value. Since the I^2 statistical values we used to determine the level of heterogeneity were determined to be over 50%, there is a high level of bias in study and a random-effects model was chosen.

When the statistical values table of *the random effect model* is examined; effect size was determined as getting an education on TCM (0.213) (estimate)<0.05. We can say that the methods had a significant effect on periods we determined (2017-2021).

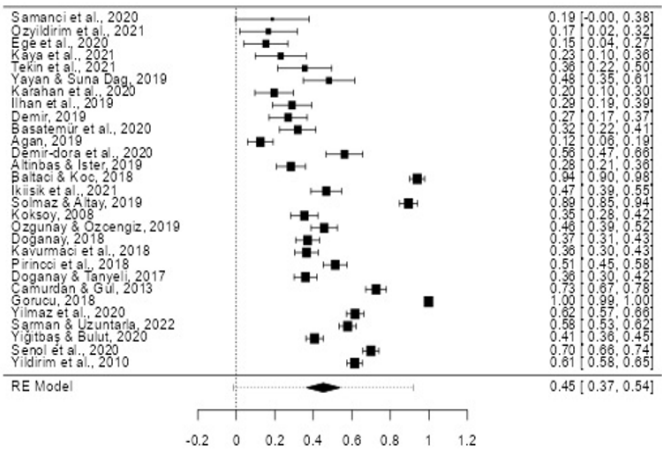

Figure 2. Prevalence of meta-analysis for traditional and complementary medicine use (29 studies in total)

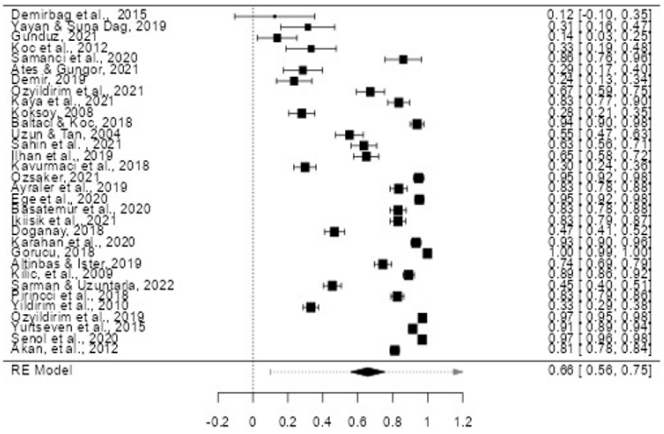

Figure 3. Prevalence of meta-analysis for traditional and complementary medicine knowledge (32 studies in total)

RESULTS

In three of the 43 studies accepted for systematic review, TCM implementations were identified by participants as follows: 16.3% to 59.8% for "alternative treatment", and between from 40.2% to 79.7% for "complementary treatment".

The top three lines of TCM implementations most used in 43 studies are, as follows:

1. Massage (16 points),
2. Herbal therapy (13 points), and
3. Acupuncture (11 points).

The first three ranks of the most well-known TCM implementations in 43 studies are, as follows:

1. Acupuncture (26 points),
2. Herbal therapy (20 points), and
3. Massage (19 points).

Prevalence of meta-analysis for traditional and complementary medicine use (29 studies in total) was found to be 45% (95% CI: 37%-54%) (**Figure 2**).

Prevalence of meta-analysis for traditional and complementary medicine knowledge (32 studies in total) was found to be 66% (95% CI: 56%-75%) (**Figure 3**).

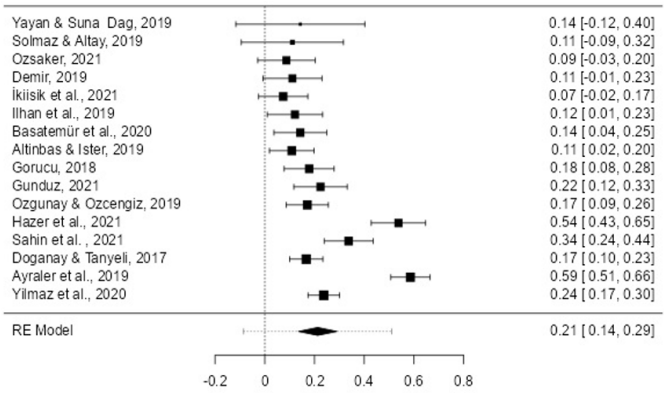

Figure 4. Prevalence of meta-analysis on training in traditional and complementary medicine (16 studies in total)

The first three ranks of the sources of information about TCM implementations in 43 studies are, as follows:

1. Internet (49 points),
2. Media (newspaper, magazine, television, etc.) (45 points),
3. Doctor or other health personnel (25 points), and friends or family circle (25 points).

Prevalence of meta-analysis on training in traditional and complementary medicine was found to be 21% (95% CI: 14%-29%) (**Figure 4**).

The question asked, "Who should do the implementations related to alternative/complementary treatments for the patients first?" This question was answered in six studies. Answers are, as follows: Physicians who were certified in three studies (min: 67.3%, max: 93.6%), everyone who was certified in two studies (39.4% and 66.1%), and every physician (no need certification) in one study 39.4%. Results of a total of 43 studies on opinions about TCM were presented in **Table 2**.

DISCUSSION

In naming traditional and complementary medicine, nomenclatures such as "folk medicine" and "alternative medicine" are also used. Traditional medicine (TM), according to the definition adopted by the WHO, is the sum of the knowledge, skills, and practices used in medicine, whether explainable or not, based on theories, beliefs, and experiences specific to different cultures (Ung et al., 2017; WHO, 2013). Complementary and alternative medicine is defined as the "supporter of modern medicine practices" (Unal and Dagdeviren, 2019; WHO, 2001). In Turkey, the opinion of the Turkish Medical Association that "there is no alternative to medicine" has been effective in the rejection of the nomenclature of "alternative medicine" (Turkish Medical Association, 2017). The word "alternative medicine" in the draft text of the regulation on traditional and complementary medicine practices was not included in the regulation. This regulation entered into force in 2014 (Official Gazette of the Republic of Turkey, 2014). This situation may pose a problem in terms of legal problems that may arise in the future (Somer and Vatanoglu-Lutz, 2017). In our study, the naming of TCM applications was questioned in three of 43 studies. The naming of the applications was reported with a frequency of 16.3%-59.8% as "alternative medicine" and with a frequency of 40.2%-79.2% as "complementary medicine". It can be said that there is confusion among health professionals in Turkey in terms of naming TCM applications. Also, nomenclature of alternative medicine has not been moved away.

In 43 studies included in our study, it was determined that the most commonly used TCM applications were massage (16 points), herbal therapy (13 points), and acupuncture (11 points). In this study, acupuncture (26 points), herbal therapy (20 points), and massage (19 points) took place in the top three ranks among the most widely used applications. Only the first three rows have changed places among themselves. The fact that the most used and known applications are compatible with each other suggests that applications are learned based on usage rather than theoretical knowledge. In Israel, a study was published in 2001 reporting that homeopathy, relaxation therapy, and reflexology are used most frequently. In the same study, the most frequently used applications in the USA; are spiritual treatments (prayer), vitamins and herbs, and mind/body approaches (Paltiel et al., 2001). In a systematic review of studies from various countries, it was reported that the most commonly used methods are herbal therapy, chiropractic, massage, and homeopathy (Frass et al., 2012). Massage is frequently used and may be known about Turkey being a tourist country. Massage service is widely offered to domestic tourists as well as foreign tourists. The fact that herbal treatments have been applied in Anatolia since ancient times has been reflected in our findings. The first legal regulation in Turkey is acupuncture (Bicer and Balcik, 2019). For this reason, the use of acupuncture may also have taken place in the upper ranks. But, practices such as homeopathy and chiropractic need to be introduced to the public. In a systematic review covering western countries, the prevalence of TCM use varies between 5% and 78% (Frass et al., 2012).

In our study, the meta-analysis prevalence for using TCM applications was 45% (95% CI: 37%-54%). Considering the studies conducted on the general population in Turkey, the prevalence of those who reported using the TCM method at least once in the previous year is over 50%. In a study conducted in a province in the west of Turkey, 58% of the participants reported that they had used the TCM method at least once in the previous year (Aydin et al., 2008). The same prevalence was reported as 70% in a study conducted in eastern Turkey (Tan et al., 2004). In studies conducted on the general population, approximately 50% of the use of TCM has been reported in the USA and England (Frass et al., 2012; Harris et al., 2012). According to the results of studies conducted in 15 countries; reports the prevalence of any TCM use in the last 12 months is between 9.8% and 76%. In studies conducted in Singapore and Australia, the frequency of TCM use during the last 12 months was reported as 76% and 68.9%, respectively (Lim et al., 2005; Xue et al., 2007). The frequency of TCM use in Africa is reported to be 60-70% (Abdullahi, 2011). Since our study included medical doctors and other health professionals, it is acceptable that the frequency of using TCM is slightly lower than that of the general population. However, this finding indicates that approximately one out of every two healthcare professionals in Turkey uses TCM. This is a fairly high prevalence. The results of studies reporting the frequency of TCM use in

Table 2. Results of a total of 43 studies about opinions on TCM

Opinions on TCM	n	%
Opinions on TCM education		
TCM training should be provided to health personnel in vocational education/They should have knowledge/He wants training	19	21.9-85.3
Training programs on TCM methods should be established and this subject should be included in the curriculum /I would like to establish a TCM Department at the university	22	36.7-90.4
Positive opinions on TCM		
TCM methods are effective. Therefore, it can be used safely/As effectively as medical treatment	21	4,0-82.1
TCM can be used in conjunction with/additional medical therapy	17	33.9-82.6
It should be applied by evaluating their effectiveness with controlled studies	12	34.4-95.7
TCM methods should be used in patient care and treatment/I use it	11	18.7-86.5
It is a curative field separate from modern medicine	1	41.0
It is complementary to modern medicine/It is scientific	4	16.4-54.3
Negative opinions on TCM		
TCM adversely affects health, so it should not be used	3	9.0-36.1
It is one of the popular cultural tools	1	9.0
TCM is a useless method/practice /It is dangerous/It is not scientific/Delays the actual treatment	9	11.7-79.6
TCM methods should never be used in conjunction with medical treatment	1	28.9
Some practitioners who apply TCM methods benefit from the helplessness of patients through these methods. They see this as a source of income	3	14.0-19.7
Opinions on TCM management		
It is positive that regulation & supervision of TCM methods are among duties of the general directorate of health services	1	69.7
TCM methods should be covered by the Social Security Institution	3	21.9-61.6
There is already/should be a legal regulation on TCM	1	8.9
I know about TCM regulation	3	8.2-66.3
Other opinions		
It is necessary to question the patients' use of TCM while taking a history	6	7.7-85.0

Note. **n**: How many studies provided information?; **%**: For opinion min-max percentage

healthcare professionals are, as follows: In a study conducted on health planners in Minnesota, the frequency of at least one TCM use was reported as 42% (Gray et al., 2002). In a study conducted on healthcare workers in Egypt, it was reported that 4.12% of the participants usually use TCM and 38.14% sometimes use TCM (about 42% in total) (ElOlemy et al., 2018). The results of the studies are consistent with our study result.

In our study, the prevalence of meta-analysis was found to be 66% (95% CI: 56-75%) for adequate knowledge of TCM applications. This result suggests that two-thirds of health professionals in Turkey have knowledge about TCM. This prevalence value, which can be considered quite well for the general population, indicates that there is a need for education about TCM for healthcare professionals. Because physicians and other health personnel who are conventional medicine practitioners have sufficient knowledge about TCM, it will enable them to be more effective in health education studies for the public. It is important for health professionals to know TCM practices at a better level in order to increase the health literacy of the public, especially in preventive medicine and treatment choices of patients.

In our study, the prevalence value of the meta-analysis was determined as 21% (95% CI: 14%-29%) for those who received training on TCM applications. This suggests that one out of every five healthcare professionals in Turkey has received training in TCM. This value should be considered low for today. In our study, the fact that the internet and the media come before doctors and health institutions in the list of information sources about TCM suggests that there is an inadequacy in education. According to our results presented in **Table 2**, it is seen that both physicians and non-physician health personnel want to receive training on TCM. In 19 studies included in our study, the opinion of willingness to receive education varies between 21.9% and 85.3%. However, the opinion that TCM courses should be included in the curriculum of medical and other health schools varies between 36.7% and 90.4% in 22 studies. When we evaluate our results together, there is a demand that doctors and other health personnel in Turkey show interest in TCM, want to receive training, and include this training in the curriculum. It is believed that this demand and demand will gradually increase. Currently, certificate programs approved by the Ministry of Health are carried out in order to carry out TCM applications in Turkey (Arpaci, 2021). In the future, it can be expected that certificate programs will be replaced by curricula in medical and health schools. The results of some studies conducted in various countries can be summarized as follows:

In the study conducted on health professionals at Kashan University, Iran, 88.4% of the participants had not received complementary and traditional medicine training before, and 77.8% were interested in learning in this field. In addition, 56% of the participants recommended complementary and traditional therapies to others (Adib-Hajbaghery and Hoseinian, 2014). A qualitative study was conducted on healthcare professionals at five selected hospitals in Malaysia. Almost all participants agreed that TCM should be a part of future education for healthcare professionals (Abuduli et al., 2016). According to the results of the study conducted in Trinidad and Tobago, more than 80% of doctors and other health professionals think that they should be more educated about TCM (Bahall and Legall, 2017). In the Riyadh region of Saudi Arabia, it has been reported that the desire of health professionals to develop knowledge about TCM and to create a positive attitude has increased (AlBedah et al., 2012). In a study conducted on Australian critical care nurses, it was reported that the majority of the participants supported

further education on TCM (Cooke et al., 2012). Sewitch et al. (2008) reported in their review study that more than 80% of primary care physicians were willing to increase their knowledge about TCM practices.

In this study, the most used information sources for TCM were the internet and the media, while doctors and other health personnel, friends, and family circles took the third place. The results reported in terms of information sources from various countries are as follows: In the study conducted in the Riyadh region of Saudi Arabia, the primary sources of information for TCM are the mass media (about 60%) and family, relatives, and friends (about 30%), and these are health education institutions (about 15%) (AlBedah et al., 2012). Among medical students in Ghana, the most important source of information for TCM is their relatives and friends (Ameade et al., 2016). In a study from Urmia, Iran, it was reported that families play an important role as a source of acquaintance with complementary and alternative medicine among medical students. In addition, cultural and religious beliefs among students' family members may force them to choose TCM practices (Sadeghi et al., 2016). As can be seen, doctors and health personnel do not come first among the sources of information for TCM. The social environment and internet, and media are more effective. For this reason, it is important that TCM takes place in medicine and health education both in Turkey and in other countries.

The global increase in demand for TCM has led some medical schools in Western and many Asian countries to include TCM in their curricula (Fenton and Morris, 2003). In the 19 articles included in this systematic review, the frequency of those who want to be trained in TCM or who want to train themselves in vocational training ranged from 21.9% to 85.3%. TCM education programs should be established, and this subject should be included in the curriculum of medical and health schools, or a TCM Department should be established in universities, with 22 articles reporting a frequency of 36.7% to 90.4%. These results show that the demand for training on TCM among physicians and other healthcare professionals is on the rise. In addition, in the near future, TCM courses should be included in the curriculum of medical and health schools instead of certificate programs for TCM practices in Turkey. In a study conducted in the USA, it was reported that in the 1997-1998 academic year, 64% of medical faculties had elective courses for TCM or TCM subjects included in compulsory courses (Wetzel et al., 1998). In a study conducted on US medical students and published in 2011, it was reported that a high-quality TCM-related medical education and research on TCM applications would facilitate the integration of TCM into the medical curriculum (Abbott et al., 2011). A study was conducted in seven medical schools in South Africa. Six of these medical schools taught traditional African medicine and other TCM courses (Chitindingu et al., 2014). Ayat et al. (2019) explained the necessity of increasing scientific research on Persian medicine, which has a history of 7,000 years in Iran, and incorporating TCM courses into the general medical curriculum in Iran. We can say that the approach of healthcare professionals in Turkey regarding the inclusion of TCM in the medical curriculum is in line with global developments.

When positive opinions about TCM are evaluated; "TCM methods are effective. Therefore, it can be used with confidence. It is as effective as medical treatment." opinion was questioned in 21 articles, and results were obtained between 4.0% and 82.1%. Frequencies less than 50% belong to some studies performed on doctors. The frequency of agreeing with this opinion among other health personnel other than doctors is over 50%. The frequency of agreement with the opinion that "TCM is given with medical treatment" is between 33.9% and 82.6%. "The effectiveness of TCM applications should be evaluated with controlled studies." opinion varies between 34.4% and 95.7%. Those considering a treatment area separate from modern medicine were reported as 41% in a study (Ilhan et al., 2019). The frequency of those who think that TCM methods should be used in patient care and treatment or who use them themselves is between 18.7% and 86.5%. The lowest frequency (18.7%) belongs to a study conducted on oncology nurses (Metin et al., 2018). The frequency of those who think that TCM is scientific and complementary to modern medicine and for TCM varies between 16.4% and 54.3%.

When negative opinions about TCM are evaluated; "TCM adversely affects health, so it should not be used." Opinions were reported between 9.0% and 36.1% in only three articles. The high frequency (36.1%) belongs to a study conducted with medical students (Kaya et al., 2021). "It is one of the popular cultural tools." opinion was reported in only one study, and the frequency in health services vocational school students was reported to be very low (9.0%) (Ilhan et al., 2019). The opinion that "TCM is ineffective or dangerous or unscientific" ranged from 11.7% to 79.6%. The high frequency (79.6%) belongs to a study conducted on pediatricians (Ates and Gungor, 2021). "TCM methods should never be used in conjunction with medical treatment." In a study conducted on midwifery nursing students, it was reported as 28.9% (Altinbas and Ister, 2019). "Some practitioners who practice TCM methods take advantage of patients' desperation through these methods. They see it as a source of income." opinion was reported between 14.0% and 19.7% in three studies.

We can say that the negative opinions, in which we evaluate the positive and negative opinions in general, are more dominant among doctors (and medical students) than other health personnel and students. However, the frequency of positive opinions for all study results is higher than the opinions that have been. These results suggest that health personnel's interest in TCM applications is increasing, while physicians are more concerned in terms of confidence in the effectiveness of the applications.

The results of the research that report the opinions of health professionals or students from various countries about TCM are as follows: In a qualitative study in Australia, the opinions of 18 healthcare providers about the use of TCM in cancer patients were examined. It was reported that most of the participants did not have sufficient knowledge about TCM and they were concerned about the negative interactions that may occur when TCM is used together with cancer treatments offered by modern medicine. Some healthcare providers have said that the positive effects of TCM are not real but placebo effects (Gall et al., 2019). In a study conducted on 1247 healthcare professionals working at the University Hospital of

Lausanne in Switzerland, personal experience, clinical experience, and evidence from randomized controlled trials were reported as the three most important factors affecting opinions about TCM. Personal experience was more important for nurses and midwives than doctors. Doctors, on the other hand, relied more on the results of randomized controlled trials than nurses and midwives. Those who received training in TCM had a more positive view of TCM than those who did not (Aveni et al., 2017). In a study of 350 students at King Saud bin Abdulaziz University of Health Sciences (KSAU-HS) in Jeddah, Saudi Arabia, the majority of students (75.8%) believed that TCM could be used for the mental and spiritual aspects of health and that CAM providers lead a healthy lifestyle. They think that it gives good information about maintaining. About one-third of these students had taken formal coursework or training in TCM and had requests for training.

In our study, it was reported positively that the regulation and supervision of TCM methods with a frequency of approximately 70% are among the duties of the General Directorate of Health Services in a study (Demir, 2019). In three studies, the opinion that TCM practices should be covered by the Social Security Institution was reported between 21.9% and 61.6%. In a study, it was reported that there is a legal regulation regarding TCM in Turkey (Yayan and Suna Dag, 2019). In three studies, it was reported between 7.7% and 85.0% that there is a regulation on TCM in Turkey. These views on TCM management and policies suggest that the legislation and policies developed on TCM among health professionals in Turkey are not sufficiently known. In this study, patients were asked the question of who should do the alternative/complementary treatments first. The predominant answer was "certified doctors". Today, the most important legal basis for TCM in Turkey is the Regulation on Traditional and Complementary Medicine Practices (Date: 27 October 2014 and No: 29158). 15 TCM applications in Turkey are covered by this regulation:

1. Acupuncture,
2. Apitherapy,
3. Phytotherapy,
4. Hypnosis,
5. Leech application,
6. Homeopathy,
7. Chiropractic,
8. Cup (dry cup and wet cup [Hijama] application),
9. Larva application,
10. Mesotherapy,
11. Prolotherapy,
12. Osteopathy,
13. Ozone application,
14. Reflexology, and
15. Musicotherapy.

TCM practices in Turkey are not covered by the Social Security Institution (Somer and Vatanoglu-Lutz, 2017). In accordance with the answers given in our study, TCM applications in the relevant Regulation should be performed by certified doctors/dentists. According to the results of this study, studies on the integration of TCM applications with modern medical applications should be continued in the future. TCM education should be included in the curriculum of medical and health schools. The legal basis for TCM should be strengthened, ethical issues should be resolved, and evidence-based research should be continued.

Limitations

The results of this study are related to Turkey only. In the articles included in the study, it was not possible to compare the views on TCM of doctors and other health professionals. Because in some studies, study groups were formed by considering doctors and other health professionals together. In the study, TCM is covered in general. Studies on the treatment of a specific disease (such as cancer) with TCM applications were excluded.

CONCLUSION

There is increasing interest in TCM and concerns remain due to the lack of evidence-based studies. The frequency of negative thinking in physicians is higher than that of other healthcare personnel. However, in general, positive opinions about TCM were found to be dominant over negative opinions. The demand for TCM training and including TCM in school curricula is striking.

Author contributions: All co-authors have involved in all stages of this study while preparing the final version. They all agree with the results and conclusions.

Funding: No external funding is received for this article.

Declaration of interest: The authors declare that they have no competing interests.

Ethics approval and consent to participate: Not applicable.

Availability of data and materials: All data generated or analyzed during this study are available for sharing when appropriate request is directed to corresponding author.

REFERENCES

Abbott, R. B., Hui, K. K., Hays, R. D., Mandel, J., Goldstein, M., Winegarden, B., et al. (2011). Medical student attitudes toward complementary, alternative and integrative medicine. *Evidence-Based Complementary and Alternative Medicine*, 2011, 1-14. https://doi.org/10.1093/ecam/nep195

Abdullahi, A. A. (2011). Trends and challenges of traditional medicine in Africa. *African Journal of Traditional, Complementary and Alternative Medicines*, 8(5 Suppl), 115-123. https://doi.org/10.4314/ajtcam.v8i5SS.5

Abuduli, M., Isa, Z. M., Eker, H. H. and Aljunid, S. M. (2016). A qualitative study about view of traditional and complementary medicine among health professionals in Malaysia. *SM Journal of Community Medicine*, 2(2), 1020.

Adib-Hajbaghery, M. and Hoseinian, M. (2014). Knowledge, attitude and practice toward complementary and traditional medicine among Kashan health care staff, 2012. *Complementary Therapies in Medicine*, 22(1), 126-132. https://doi.org/10.1016/j.ctim.2013.11.009

Agan, S. (2019). *Sağlık bilimleri fakültesi öğrencilerinin tamamlayıcı, alternatif tedavi ve modern tıbba ilişkin tutum ve davranışları* [*Attitudes and behaviors of health sciences faculty students towards complementary, alternative therapy and modern medicine*] [Doctoral dissertation, Marmara University].

Akan, H., Izbirak, G., Kaspar, E. C., Kaya, C. A., Aydin, S., Demircan, N., Bucaktepe, P. G., Ozer, C., Sahin, H. A. and Hayran, O. (2012). Knowledge and attitudes towards complementary and alternative medicine among medical students in Turkey. *BMC Complementary and Alternative Medicine*, 12, 115. https://doi.org/10.1186/1472-6882-12-115

AlBedah, A. M., El-Olemy, A. T. and Khalil, M. K. (2012). Knowledge and attitude of health professionals in the Riyadh region, Saudi Arabia, toward complementary and alternative medicine. *Journal of Family & Community Medicine*, 19(2), 93-99. https://doi.org/10.4103/2230-8229.98290

Altinbas, Y. and Ister, E. D. (2019). Sağlık yüksekokulu öğrencilerinin tamamlayıcı ve alternatif tedaviler hakkındaki görüş, bilgi ve uygulamaları [Opinions, knowledge and practices of health school students about complementary and alternative therapies]. *Sakarya Üniversitesi Holistik Sağlık Dergisi* [*Sakarya University Journal of Holistic Health*], 2(1), 47-60.

Ameade, E. P. K., Amalba, A., Helegbe, G. K. and Mohammed, B. S. (2016). Medical students' knowledge and attitude towards complementary and alternative medicine–A survey in Ghana. *Journal of Traditional and Complementary Medicine*, 6(3), 230-236. https://doi.org/10.1016/j.jtcme.2015.03.004

Arpaci, O. (2021). Traditional and integrative medicine practices approved by the Ministry of Health and Evaluation of the Compliance of These Practices with the Law. *Dokuz Eylul University Faculty of Law Journal*, 23(2), 1245-1307. https://doi.org/10.33717/deuhfd.998230

Ates, S. and Gungor, A. (2021). Çocuk hekimlerinin geleneksel ve tamamlayıcı tıp tedavisi uygulamaları ile ilgili bilgi ve tutumlarının değerlendirilmesi [Evaluation of the knowledge and attitudes of pediatricians about traditional and complementary medicine treatment practices]. *Van Health Sciences Journal*, 14(1), 7-18. https://doi.org/10.52976/vansaglik.752863

Aveni, E., Bauer, B., Ramelet, A. S., Decosterd, I., Ballabeni, P., Bonvin, E. and Rodondi, P. Y. (2017). Healthcare professionals' sources of knowledge of complementary medicine in an academic center. *PLoS ONE*, 12(9), e0184979. https://doi.org/10.1371/journal.pone.0184979

Aydin, S., Bozkaya, A. O., Mazicioglu, M. M., Gemalmaz, A., Ozcakir, A. and Ozturk, A. (2008). What influences herbal medicine use? Prevalence and related factors. *Turkish Journal of Medical Sciences*, 38(5), 455-463.

Ayraler, A., Ozturk, O. and Oruc, M. A. (2019). Knowledge levels and attitudes of medical faculty personnel on traditional and complementary medicine. *Education in Medicine Journal*, 11(4), 37-45. https://doi.org/10.21315/eimj2019.11.4.4

Bahall, M. and Legall, G. (2017). Knowledge, attitudes, and practices among health care providers regarding complementary and alternative medicine in Trinidad and Tobago. *BMC Complementary and Alternative Medicine*, 17(1), 1-9. https://doi.org/10.1186/s12906-017-1654-y

Baltaci, N. and Koc, E. (2018). İntörn hemşirelik ve ebelik öğrencilerinin tamamlayıcı ve alternatif tıbba yönelik bilgisi, kullanımı ve tutumları [Intern nursing and midwifery students' knowledge, use and attitudes towards complementary and alternative medicine]. *Samsun Sağlık Bilimleri Dergisi* [*Samsun Journal of Health Sciences*], 3(1), 10-16.

Barnes, P. M., Powell-Griner, E., McFann, K. and Nahin, R. L. (2004). Complementary and alternative medicine use among adults: United States, 2002. *Advance Data*, (343), 1-19. https://doi.org/10.1016/j.sigm.2004.07.003

Basatemur, M., Gunes, G. and Aylaz, R. (2020). Tıp fakültesi öğrencilerinin geleneksel ve tamamlayıcı tedavi konusunda bilgi, tutum ve davranışları [Knowledge, attitudes and behaviors of medical faculty students about traditional and complementary therapy]. *ESTUDAM Halk Sağlığı Dergisi* [*ESTUDAM Journal of Public Health*], 5(1), 43-52. https://doi.org/10.35232/estudamhsd.642084

Bicer, I. and Balcik, P. Y. (2019). Traditional and complementary medicine: Examination of Turkey and selected countries. *Hacettepe Journal of Health Administration*, 22(1), 245-257.

Camurdan, C. and Gul, A. (2013). Complementary and alternative medicine use among undergraduate nursing & midwifery students in Turkey. *Nurse Education in Practice*, 13(5), 350-354. https://doi.org/10.1016/j.nepr.2012.09.015

Chitindingu, E., George, G. and Gow, J. (2014). A review of the integration of traditional, complementary and alternative medicine into the curriculum of South African medical schools. *BMC Medical Education*, 14(1), 1-5. https://doi.org/10.1186/1472-6920-14-40

Cooke, M., Mitchell, M., Tiralongo, E. and Murfield, J. (2012). Complementary and alternative medicine and critical care nurses: A survey of knowledge and practices in Australia. *Australian Critical Care*, 25(4), 213-223. https://doi.org/10.1016/j.aucc.2011.12.055

Demir, E. (2019). *Sağlık çalışanlarının geleneksel ve tamamlayıcı tedavi yöntemlerine yönelik bilgi, tutum ve davranışları* [*Knowledge, attitudes and behaviors of healthcare professionals towards traditional and complementary treatment methods*] [Master's thesis, Biruni University].

Demirbag, B. C., Kurtuncu, M. and Erkaya, R. (2015). Attitudes towards the holistic complementary and alternative medicine: midwives working in the family health care in Turkey. *Scholars Journal of Applied Medical Sciences*, 3(1D), 261-266.

Demir-Dora, D., Aksoyalp, Z. S. and Nacitarhan, C. (2020). Knowledge level and attitude towards complementary and alternative treatment methods among medical students: a cross-sectional survey study in Turkey. *Current Medical Research and Opinion*, 36(9), 1465-147. https://doi.org/10.1080/03007995.2020.1786679

Doganay, S., Guzel, D., Ozturk, D. and Tanyeli, A. (2018). Complementary and alternative medicine: Understanding, attitude and usage among Turkish health sciences and medical students. *Journal of Contemporary Medicine*, 8(1), 48-54. https://doi.org/10.16899/gopctd.414746

Duval, S. and Tweedie, R. (2000). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*, 56(2), 455-463. https://doi.org/10.1111/j.0006-341X.2000.00455.x

Ege, B., Kurt, M. Y., Ege, M. and Geyik, A. (2020). Diş hekimliği fakültesi öğrencilerinin geleneksel ve tamamlayıcı tıp uygulamaları ile ilgili tutumlarının değerlendirilmesi [Evaluation of dentistry faculty students' attitudes towards traditional and complementary medicine practices]. *Journal of Traditional and Complementary Medicine,* 3(2), 178-190. https://doi.org/10.5336/jtracom.2020-73513

Ekmekci, P. E. (2018). 3.000 yıl öncesinden günümüze geleneksel Çin tıbbi; tarihi, bugünü ve geleceği [Traditional Chinese medicine from 3,000 years ago; history, present and future]. *Geleneksel ve Tamamlayıcı Tıp Dergisi* [*Journal of Traditional and Complementary Medicine*], 1(3), 132-40. https://doi.org/10.5336/jtracom.2018-63049

ElOlemy, A. T., Radwan, N. M., Dawood, W., Ali, I. and Fouda, L. M. (2018). Complementary and alternative medicine use among health workers in Mid-Delta, Egypt. *Majmaah Journal of Health Sciences*, 1(2), 35-35.

Fenton, M. V. and Morris, D. L. (2003). The integration of holistic nursing practices and complementary and alternative modalities into curricula of schools of nursing. *Alternative Therapies in Health and Medicine*, 9(4), 62-67.

Frass, M., Strassl, R. P., Friehs, H., Müllner, M., Kundi, M. and Kaye, A. D. (2012). Use and acceptance of complementary and alternative medicine among the general population and medical personnel: A systematic review. *Ochsner Journal*, 12(1), 45-56.

Gall, A., Anderson, K., Adams, J., Matthews, V. and Garvey, G. (2019). An exploration of healthcare providers' experiences and perspectives of traditional and complementary medicine usage and disclosure by indigenous cancer patients. *BMC Complementary and Alternative Medicine*, 19(1), 1-9 https://doi.org/10.1186/s12906-019-2665-7

Gorucu, R. (2018). *Hemşirelerin tamamlayıcı ve alternatif tedavi yöntemlerine yönelik görüş ve tutumları* [*Views and attitudes of nurses towards complementary and alternative treatment methods*] [Master's thesis, Kirklareli University].

Gray, C. M., Tan, A. W., Pronk, N. P. and O Connor, P. J. (2002). Complementary and alternative medicine use among health plan members. A cross-sectional survey. *Effective Clinical Practice*, 5(1), 17-22.

Gunduz, I. (2021). Bir üçüncü basamak hastanesinde çalışan hekimlerin geleneksel ve tamamlayıcı tıp ile ilgili bilgi düzeyleri ve yaklaşımları [Knowledge levels and approaches of physicians working in a tertiary care hospital about traditional and complementary medicine] [Master's thesis, Pamukkale University].

Harris, P. E., Cooper, K. L., Relton, C. and Thomas, K. J. (2012). Prevalence of complementary and alternative medicine (CAM) use by the general population: A systematic review and update. *International Journal of Clinical Practice*, 66(10), 924-939.https://doi.org/10.1111/j.1742-1241.2012.02945.x

Hazer, B., Keles B. Y., Ferahman, D., Ones, K. (2021). Physiatrists' perspective on traditional and complementary medicine. *International Journal of Traditional and Complementary Medicine Research*, 2(2),69-72. https://doi.org/10.53811/ijtcmr.916173

Ikiisik, H., Kutay Yilmaz, F., Baltali, O., Direk, S., Yayci, S., Tahmazoglu, E., Bayraktar, M., Gencturk, O. and Maral, I. (2021). Araştırma görevlisi hekimlerin geleneksel ve tamamlayıcı tıp uygulamaları konusunda düşünce, tutum ve Ddavranışları: Kesitsel bir araştırma [Thoughts, attitudes and behaviors of research assistant physicians on traditional and complementary medicine practices: A cross-sectional study]. *Geleneksel ve Tamamlayıcı Tıp Dergisi* [*Journal of Traditional and Complementary Medicine*], 4(2), 246-255. https://doi.org/10.5336/jtracom.2021-82719

Ilhan, A. O., Sirekbasan, S. and Tan, T. G. (2019). Sağlık hizmetleri meslek yüksek okulu öğrencilerinin geleneksel ve tamamlayıcı tıp ile ilgili bilgi düzey ve tutumlarının değerlendirilmesi [Evaluation of the knowledge level and attitudes of health services vocational school students about traditional and complementary medicine]. *Ankara Medical Journal*, 19(4), 736-744. https://doi.org/10.17098/amj.651980

Jaiswal, Y. S. and Williams, L. L. (2017). A glimpse of Ayurveda–The forgotten history and principles of Indian traditional medicine. *Journal of Traditional and Complementary Medicine*, 7(1), 50-53. https://doi.org/10.1016/j.jtcme.2016.02.002

Karahan, S., Agadayı, E. and Karagoz, N. (2020). Evaluation of medical school students' knowledge, attitudes, and behaviors regarding traditional and complementary medicine. *Cumhuriyet Medical Journal*, 42(4), 434-440. https://doi.org/10.7197/cmj.842511

Kavurmaci, M., Tan, M. and Kavurmaci, Z. (2018). Nursing, midwifery, and dietetics students' attitudes to complementary and integrative medicine and their applications. *Medical Journal of Bakirkoy*, 14(3), 300-305. https://doi.org/10.5350/BTDMJB.20170606124143

Kaya, A., Gunel, M. G. and Nurullazade, Y. (2021). An investigation of the knowledge and attitudes of medical faculty students on traditional and complementary medicine. *International Journal of Traditional and Complementary Medicine Research*, 2(1), 14-19.

Kilic, S., Ogur, R., Yaren, H., Akkoyun, N. G. and Kupcuk, E. (2009). Knowledge of and attitudes toward complementary and alternative medicine amongst medical students in a Turkish medical school. *Pakistan Journal of Medical Sciences Online*, 25(2), 319-324.

Koc, Z., Topatan, S. and Saglam, Z. (2012). Use of and attitudes toward complementary and alternative medicine among midwives in Turkey. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 160(2), 131-136. https://doi.org/10.1016/j.ejogrb.2011.10.006

Koksoy, S. (2008). *Yataklı sağlık kuruluşlarında çalışan doktor, hemşire ve ebelerin tamamlayıcı ve alternatif tedavi yöntemlerini bilme ve kullanma durumları* [*Knowing and using complementary and alternative treatment methods of doctors, nurses and midwives working in inpatient health institutions*] [Master's thesis, Mersin University].

Lim, M. K., Sadarangani, P., Chan, H. L. and Heng, J. Y. (2005). Complementary and alternative medicine use in multiracial Singapore. *Complementary Therapies in Medicine*, 13(1), 16-24. https://doi.org/10.1016/j.ctim.2004.11.002

Metin, Z. G., Izgu, N., Karadas, C. and Donmez, A. A. (2018). Perspectives of oncology nurses on complementary and alternative medicine in Turkey: A cross-sectional survey. *Holistic Nursing Practice*, 32(2), 107-113. https://doi.org/10.1097/HNP.0000000000000256

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L. A. and PRISMA-P Group. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMAP) 2015 statement. *Systematic Reviews*, 4, 1. https://doi.org/10.1186/2046-4053-4-1

Official Gazette of the Republic of Turkey. (2014). *Regulation on traditional and complementary medicine practices, 27 October 2014. Number: 29158*. Ankara: Prime Ministry Press.

Ozgunay, S. E. and Ozcengiz, D. (2019). Anestezistlerin geleneksel ve tamamlayıcı tıbba bakışı, bilgi ve uygulamaları [Anesthesiologists' perspective on traditional and complementary medicine, their knowledge and practices]. *Cukurova Medical Journal*, 44(4), 1237-1242. https://doi.org/10.17826/cumj.484542

Ozsaker, E. (2021). The knowledge and attitudes of nursing senior students regarding traditional and complementary medicine. *Van Sağlık Bilimleri Dergisi* [*Van Journal of Health Sciences*], 14(2), 153-162. https://doi.org/10.52976/vansaglik.823136

Ozyildirim, B., Ince, O. and Torun, P. (2019). The knowledge and attitudes towards recent regulations on complementary and alternative medicine among students and faculty members in Bezmialem University School of Medicine (BVUSOM). *Indian Journal of Traditional Knowledge*, 18(4), 824-829.

Ozyildirim, C., Kayacan, A. G., Kaya, S. and Sokulmez, P. (2021). Attitudes and approaches of nutrition and dietetics department students toward complementary and alternative medical treatment methods: A cross-sectional study. *Balıkesir Sağlık Bilimleri Dergisi* [*Balikesir Journal of Health Sciences*], 10(1), 21-28.

Paltiel, O., Avitzour, M., Peretz, T., Cherny, N., Kaduri, L., Pfeffer, R. M., Wagner, R. M. and Soskolne, V. (2001). Determinants of the use of complementary therapies by patients with cancer. *Journal of Clinical Oncology*, 19(9), 2439-2448. https://doi.org/10.1200/JCO.2001.19.9.2439

Patsopoulos, N. A., Evangelou, E. and Ioannidis, J. P. (2008). Sensitivity of between-study heterogeneity in meta-analysis: Proposed metrics and empirical evaluation. *International Journal of Epidemiology*, 37(5), 1148-1157. https://doi.org/10.1093/ije/dyn065

Pirincci, E., Kaya, F., Cengizhan, S. and Onal, F. (2018). Nursing department students' knowledge and use of complementary and alternative medicine methods. *Journal of Turgut Ozal Medical Center*, 25(1), 22-29. https://doi.org/10.5455/jtomc.2017.07.099

Sadeghi, M., Rabiepoor, S., Forough, A. S., Jabbari, S. and Shahabi, S. (2016). A survey of medical students' knowledge and attitudes toward complementary and alternative medicine in Urmia, Iran. *Journal of Evidence-Based Complementary & Alternative Medicine*, 21(4), 306-310. https://doi.org/10.1177/2156587215605751

Sahin, C. U., Cilingir, D. and Hintistan, S. (2021). Knowledge, attitude and practices of nursing students about cmplementary health approaches. *Geleneksel ve Tamamlayıcı Tıp Dergisi* [*Journal of Traditional and Complementary Medicine*], 4(1), 1-9. https://doi.org/10.5336/jtracom.2020-76000

Samanci, R., Samanci, V. M., Gunel, M. G., Yildiz, S. N. and Ataoglu, S. (2020). Investigation of the knowledge and attitude of physicians about traditional and complementary medicine. *International Journal of Traditional and Complementary Medicine Research*, 1(3), 118-124.

Sarman, A. and Uzuntarla, Y. (2021). Attitudes of healthcare workers towards complementary and alternative medicine practices: A cross-sectional study in Turkey. *European Journal of Integrative Medicine*, 102096. https://doi.org/10.1016/j.eujim.2021.102096

Senol, Y., Erdemli, B. and Demirezen, M. (2020). Tıp fakültesi öğrencilerinin geleneksel ve tamamlayıcı tıp hakkındaki bilgi ve davranışlarının incelenmesi [Examining the knowledge and behaviors of medical faculty students about traditional and complementary medicine]. *Anadolu Güncel Tıp Dergisi* [*Anatolian Journal of Contemporary Medicine*], 2(1), 6-12. https://doi.org/10.38053/agtd.617200

Sewitch, M. J., Cepoiu, M., Rigillo, N. and Sproule, D. (2008). A literature review of health care professional attitudes toward complementary and alternative medicine. *Complementary Health Practice Review*, 13(3), 139-154. https://doi.org/10.1177/1533210108325549

Solmaz, T. and Altay, B. (2019). Üniversite öğrencilerinin tamamlayıcı ve alternatif tedavi yöntemlerini kullanma durumları [The use of complementary and alternative treatment methods by university students]. *Pamukkale Tıp Dergisi* [*Pamukkale Medical Journal*], 12(3), 387-393. https://doi.org/10.31362/patd.526867

Somer, P., Vatanoglu-Lutz, E. E. (2017). A legal and ethical evaluation of the regulations on traditional and complementary medicine. *Anatolian Clinic Journal of Medical Science*, 22(1), 58-65. https://doi.org/10.21673/anadoluklin.284478

Tan, M., Uzun, O. and Akcay, F. (2004). Trends in complementary and alternative medicine in eastern Turkey. *Journal of Alternative & Complementary Medicine*, 10(5), 861-865. https://doi.org/10.1089/acm.2004.10.861

Tekin, R., Gorpelioglu, S., Aypak, C., Suvak, O. and Emiroglu, C. (2021). The knowledge and attitudes of the non-health worker citizens and physicians about traditional and complementary medicine: A cross-sectional study. *Eurasian Journal of Family Medicine*, 10(3), 107-114. https://doi.org/10.33880/ejfm.2021100301

Turkish Medical Association. (2017). *There is no alternative to medicine! Traditional, alternative and complementary medicine practices*. Available at: https://www.ttb.org.tr/kutuphane/gatt_2017.pdf (Accessed April 7, 2022).

Unal, M. and Dagdeviren, H. N. (2019). Traditional and complementary medicine methods. *Eurasian Journal of Family Medicine*, 8(1), 1-9. https://doi.org/10.33880/ejfm.2019080101

Ung, C. O. L., Harnett, J. and Hu, H. (2017). Community pharmacist's responsibilities with regards to traditional medicine/complementary medicine products: a systematic literature review. *Research in Social and Administrative Pharmacy*, 13(4), 686-716. https://doi.org/10.1016/j.sapharm.2016.08.001

Uzun, O. and Tan, M. (2004). Nursing students' opinions and knowledge about complementary and alternative medicine therapies. *Complementary Therapies in Nursing and Midwifery*, 10(4), 239-244. https://doi.org/10.1016/j.ctnm.2004.06.004

Wetzel, M. S., Eisenberg, D. M. and Kaptchuk, T. J. (1998). Courses involving complementary and alternative medicine at US medical schools. *JAMA*, 280(9), 784-787. https://doi.org/10.1001/jama.280.9.784

WHO. (2001). Legal status of traditional medicine and complementary. *World Health Organisation*. Available at: https://apps.who.int/iris/bitstream/handle/10665/42452/WHO_EDM_TRM_2001.2_eng.pdf (Accessed: April 7, 2022).

WHO. (2013). WHO traditional medicine strategy 2014-2023. *World Health Organisation*. Available at: https://www.who.int/publications/i/item/9789241506096 (Accessed: April 7, 2022).

WHO. (2022). Traditional, complementary and integrative medicine. *World Health Organisation*. Available at: https://www.who.int/health-topics/traditional-complementary-and-integrative-medicine#tab=tab_1 (Accessed: March 9, 2022).

Xue, C. C., Zhang, A. L., Lin, V., Da Costa, C. and Story, D. F. (2007). Complementary and alternative medicine use in Australia: A national population-based survey. *The Journal of Alternative and Complementary Medicine*, 13(6), 643-650. https://doi.org/10.1089/acm.2006.6355

Yayan, E. H. and Suna Dag, Y. (2019). Pediatri hemşirelerinin alternatif/tamamlayıcı tedavi yöntemlerine ilişkin bilgi düzeylerinin belirlenmesi [Determining the knowledge level of pediatric nurses about alternative/complementary treatment methods]. *İnönü Üniversitesi Sağlık Hizmetleri Meslek Yüksek Okulu Dergisi* [*Journal of İnönü University Vocational School of Health Services*], 7(2), 147-156. https://doi.org/10.33715/inonusaglik.579960

Yigitbas, C. and Bulut, A. (2020). The effect of socio-demographic and cultural features on traditional, complementary and alternative medicine in healthcare students. *Journal of Contemporary Medicine*, 10(3), 370-376. https://doi.org/10.16899/jcm.758719

Yildirim, Y., Parlar, S., Eyigor, S., Sertoz, O. O., Eyigor, C., Fadiloglu, C. and Uyar, M. (2010). An analysis of nursing and medical students' attitudes towards and knowledge of complementary and alternative medicine (CAM). *Journal of Clinical Nursing*, 19(7-8), 1157-1166. https://doi.org/10.1111/j.1365-2702.2009.03188.x

Yilmaz, D. U., Dereli, F., Tuncali, S. H. and Karatekin, D. (2020). The relationship between health sciences students' perceptions of health news and their attitudes to using complementary and alternative medicine. *Complementary Therapies in Medicine*, 52, 102441. https://doi.org/10.1016/j.ctim.2020.102441

Yuan, H., Ma, Q., Ye, L. and Piao, G. (2016). The traditional medicine and modern medicine from natural products. *Molecules*, 21(5), 559. https://doi.org/10.3390/molecules21050559

Yurtseven, E., Vehid, S., Bosat, M., Sumer, E. C., Akdeniz, S. I., Cig, G. and Tahirbegolli, B. (2015). Assessment of knowledge and attitudes toward complementary and alternative medicine (CAM) amongst Turkish medical faculty students. *African Journal of Traditional, Complementary and Alternative Medicines*, 12(5), 8-13. https://doi.org/10.4314/ajtcam.v12i5.2