

**Araştırma Makalesi– Research Paper**

**PHYSIOTHERAPY AND REHABILITATION STUDENTS' KNOWLEDGE, ATTITUDES, AND BEHAVIORS RELATED TO COMPLEMENTARY AND ALTERNATIVE MEDICINE PRACTICES**

**FİZYOTERAPİ VE REHABİLİTASYON BÖLÜMÜ ÖĞRENCİLERİNİN TAMAMLAYICI VE ALTERNATİF TIP UYGULAMALARI HAKKINDAKİ BİLGİ, TUTUM VE DAVRANIŞLARI**

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**Özet**

Literatürde, öğrencilerin tamamlayıcı ve alternatif tıp (TAT) uygulamaları hakkındaki tutum ve bilgileri araştıran birçok çalışma vardır, bu çalışmaların çoğu tıp, eczacılık, hemşirelik ve psikoloji öğrencilerine odaklanmıştır ancak fizyoterapi ve rehabilitasyon (FTR) öğrencileri üzerine yapılan çalışmalar azdır. Bu çalışmanın amacı Türkiye'deki FTR bölümü öğrencilerinin TAT uygulamaları hakkındaki bilgi, tutum ve davranışlarını araştırmaktır. FTR bölümü öğrencilerinin tamamlayıcı ve alternatif tıp (TAT) uygulamaları hakkındaki bilgi, tutum ve davranışlarını belirlemek için oluşturulan elektronik anket formu kullanıldı. 18 maddeden oluşan anket elektronik posta aracılığıyla katılımcılara gönderildi. Toplamda 504 katılımcının anket sonuçları çalışmaya dahil edildi. Katılımcıların yaş ortalaması 21,66±2,5 yıl, %69,84'i kadın ve %30,16'sı erkek idi. Katılımcıların çoğu (%76,99) modern tıp ile birlikte uygulanan farklı TAT uygulamalarının yararlı olabileceğini düşünmekteydi, TAT uygulamalarının en çok online kaynaklardan öğrenildiği belirtildi (%64,68). Ayrıca öğrenciler, en çok bilinen TAT uygulamasının masaj olduğunu belirtti (%82,90). FTR bölümü öğrencilerinin büyük bir kısmı TAT uygulamaları hakkında pozitif bir görüşe sahipti. Yüksek düzeyde etkinlik gösteren kanıt dayalı TAT uygulamalarını müfredata dahil etmek, fizyoterapistlerin TAT uygulamaları hakkındaki bilgi düzeylerini artırabilir.

**Anahtar Kelimeler:** Bilgi, Fizyoterapi Öğrencileri, İnanç, Tamamlayıcı Tedaviler, Tutum.

**Abstract**

There are studies in the literature evaluating students' attitudes toward and knowledge of complementary and alternative medicine (CAM) practices, with most of this research focusing on medical, pharmacy, nursing and psychology students; however, few studies have been conducted with physiotherapy and rehabilitation (PTR) students. The aim of this study was to investigate knowledge, attitudes, and behaviors related to CAM among students of PTR. This cross-sectional study was conducted between October 2018 to March 2019. A self-administered questionnaire form developed to identify the knowledge, attitudes, and behaviors regarding CAM practices among students of PTR. The questionnaire form included eighteen items that was sent via email to the participants. A total of 504 participants were included in this study. Their mean age was 21.66±2.50 years, 69.84% was female and 30.16% was male. Most participants (76.99%) thought that various CAM practices could be beneficial adjuncts to modern medicine. The most used sources of CAM practices was reported as online resources (64.68%). Moreover, the most well-known CAM practice among the students was massage (82.90%). Majority of PTR students had a positive opinion about CAM practices. Incorporating evidence-based CAM practices with high levels of efficacy into the curricula can reliably increase physiotherapists' knowledge about CAM practices.

**Keywords:** Attitude, Belief, Complementary Therapies, Physiotherapy Students.

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## 1. INTRODUCTION

World Health Organization (WHO) defined complementary and alternative medicine (CAM) as the whole of explicable or inexplicable knowledge, skill, and practices based on the theories, beliefs, and experiences specific to different cultures that are used to maintain health as well as in the prevention, diagnosis, improvement, or treatment of physical and mental illnesses. These practices are supplementary and complementary to Western medicine (WHO, 2013, pp.2014-2015). Common methods used as CAM include phytotherapy, acupuncture, cupping therapy, hirudotherapy, hypnosis, ozone therapy, mesotherapy, apitherapy, prolotherapy, osteopathy, reflexology, homeopathy, chiropractic, larval therapy, and music therapy (Smith et al., 2011, p.92; Wieland et al, 2011, pp.51-52).

The use of CAM approaches is rapidly increasing in western country (Metcafe et al., 2010, p.2). Between 1990 and 1997, the proportion of people who used CAM in the USA increased from 34% to 42%, while this rate increased from 20% to 52% in Australia, with highest rate in Japan and South Korea 76% and 75% respectively. The reported rate of alternative medicine use is 9–80% globally, whereas in Turkey CAM methods are used at rates of 12.6–76% (Harris et al., 2012, pp.927-930; Gungormus ve Kiyak, 2012, pp.125-128). This increase may be due to the effectiveness of CAM practices, low cost, more rapid action compared to conventional treatments, or more importantly, the relatively fewer adverse effects. The use of CAM is also encouraged by World Health Organization (WHO, 2019, pp.10-17).

As CAM becomes more popular, health professionals are interested in learning more about CAM and some use CAM methods in their practice (Harris et al., 2012, pp.924-939). Physiotherapists use and recommend CAM practices to their patients more than other health professionals (Bjerså et al., 2012, p.5). Baugniet et al. reported that students in the health sciences, especially pharmacy and physiotherapy, had positive attitudes toward CAM (Baugniet et al., 2000, p.180-181). Walker et al. found that both physiotherapy (chiropractic) and nursing students had positive attitudes regarding CAM, while the chiropractic students recommended CAM practices to their patients more than the nursing students (Walker et al., 2017, pp.4-5).

There are studies in the literature evaluating students' attitudes and knowledge of CAM practices around the world, but most of this research focus on medical, pharmacy, nursing and psychology students (Ditte et al., 2011, p.228; Joyce et al., 2016, pp.336-340; Noureldin et al., 2013, pp.621-623; Lie ve Boker 2004, pp.2-4). However, there are not any studies have been conducted on PTR students. The future of CAM in the healthcare system will be determined by health professionals' views of these practices. So, the aim of this study was to assess the knowledge, attitudes, and behaviors of CAM in PTR students.



## **2. METHOD**

### **2.1. Research Design/Population**

This cross-sectional study was conducted on PTR students who had been studying at all state and private universities in Turkey between October 2018 to March 2019. At the time of data collection, the number of PTR students in Turkey was estimated as 15000 (Karagozoglu et al., 2018, pp.45-49). So, the sample size calculation with 0.05 confidence level and 4-5 confidence interval revealed that minimum students number to be recruited for the study was 375-577 students. Self-administered electronic questionnaire form was used. The 504 participants filled the forms completely and accurately. After data collection the confidence interval for this sample size was calculated as 4.21.

### **2.2. Research Instruments and Processes**

This study used a questionnaire form developed to identify the knowledge, attitudes, and behaviors regarding CAM practices among students of PTR. The questionnaire form was based on the Complementary and Alternative Medicine Health Belief Questionnaire (Lie ve Boker, 2004, p.8), Integrative Medicine Attitude Questionnaire (Schneider et al., 2003, p.7), and the Holistic Complementary and Alternative Medicine Questionnaire (Erci, 2007, p.764; Aktaş, 2017, p.56). The questionnaire form was developed by a committee including a social scientist and three physiotherapists. The first version of questionnaire form was used in a pilot study conducted with 10 PTR students to assess the understandability of the questions. The questionnaire form was revised by the committee based on the results of the pilot study. The final version comprised of 26 items in 4 sections. The first four items evaluate the descriptive information about the participants, then 18 items evaluate their beliefs and attitudes related to CAM, after that 3 items assess their perceived knowledge level, and one item reported their sources of information about CAM. The questionnaire form was transferred to the electronic environment using the Google Forms® application.

### **2.3. Data Collection**

An email containing a link of the questionnaire form and invitation text was sent to students through the Turkish Physiotherapy Association Youth Commission and the Association of Sports, Geriatric, and Pediatric Physiotherapists Youth Commissions. Students were also invited to participate in the study via announcements posted on these commissions' websites. Students accessed the electronic questionnaire form via the link address included in the invitation they received. Access was regulated to allow an individual to complete the questionnaire form only once. After the questionnaire form was completed, the responses were recorded automatically by the system. Questionnaire forms that were filled out completely and correctly were included in the study.



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The questionnaire form consisted of three parts. The first part of the form provided information about the study and asked whether the individual wanted to participate so informed consent were obtained from all who accepted to participate the study. Students who selected the “I do not agree to participate in the study” option were automatically directed to the third part of the form, the “thank you” page. Students who selected the “I agree to participate in the study” option were first directed to the page containing the questionnaire form and then to the “thank you” page after they answered the questions in the questionnaire form. The second part included the questionnaire form that was developed for the study. This part included eighteen items about knowledge, attitudes, and behaviors related to CAM practices. The questionnaire form utilized five point Likert scale.

### **2.4 Data Analysis**

The Statistical Package for the Social Sciences (SPSS) version 21 (IBM Corp., Armonk, NY, USA) software package was used for data analysis. Frequency and percent distribution were calculated for qualitative data; mean and standard deviation were calculated for quantitative data. Since this data was not suitable for quantitative analysis, the results described narratively.

### **2.5. Ethic**

The study was performed in accordance with the Declaration of Helsinki and was approved by Necmettin Erbakan University Non-interventional Clinical Research Ethics Board with decision number 2018/47. Informed consent was obtained from all participants.

## **3. RESULTS**

A total of 523 PTR students accessed the online questionnaire form. Of these, 19 students did not agree to participate in the study; therefore, the statistical analysis included the responses submitted by 504 participants (mean age,  $21.66 \pm 2.50$  years). The group comprised 69.84% (n=352) female and 30.16% (n=152) male students. They attended different universities, including state and private universities; 48.23% (n=243) were fourth-year students, 25.99% (n=131) were third-year students, 21.82% (n=110) were second-year students, and 3.96% (n=20) were first-year students.

Analysis of the students' responses to statements about CAM revealed that 46.03% thought that treatments that are not based on scientific facts can also be valuable. In addition, 33.93% of participants thought that the scientific evidence supporting CAM practices is sufficient. Similarly, large proportions (40.28%) of the respondents were not sure whether the efficiency of CAM practices could be attributed to the placebo effect. While 27.39% of the students stated that their religious beliefs influenced their attitude toward CAM practices, 58.53% stated that they did not. Regarding the use of CAM after graduation, 61.51% of the students responded favorably, while only 16.27% stated they would not use these practices.



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Similarly, 62.57% of the participants had a positive perception of CAM practices, and 77.78% believed that the patients' expectations, beliefs, and values should be integrated into the patient care process.

Majority of participants (76.99%) thought that various CAM practices could be beneficial adjuncts to modern medicine, and 68.66% stated that these practices were not a threat to public health. When the participants were asked whether financial concerns were a priority in CAM practices, a consensus could not be reached. Approximately equal proportions of students stated that there were commercial concerns (38.29%), that they were not sure (28.37%), and that there were no commercial concerns (33.33%). Of the students, 75.79% believed that CAM practices required specific expertise, 79.96% believed that they were important for PTR, and 85.91% believed that they must be applied by trained practitioners. Of the students, 66.07% believed that CAM practices should be included in the curriculum, 69.64% believed that they would benefit from professional practice and internships in institutions where CAM is implemented, and 85.72% believed that it is important for physiotherapists to be educated about these practices. While 39.28% of the students were not sure whether they had sufficient knowledge about CAM, 37.89% stated that their knowledge was insufficient (Table 1).

The participants' sources of information about CAM practices showed that 64.68% used online resources. The other sources were social circles (49.40%), healthcare specialists (39.28%), and social media (38.89%). Fewer students used printed materials such as books (33.13%) and professional practice or internships (30.16%) to obtain information about CAM practices. Other sources of information and the rate of their use are shown in Table 2.

The most well-known CAM practice among the students was massage (82.90%), followed by acupuncture (76.54%), cupping (69.78%), hirudotherapy (58.85%), meditation/yoga/relaxation (55.67%), and osteopathy (51.09%). Very few students (4.57%) stated that they had no knowledge of CAM practices (Table 3).

When asked which CAM practice(s) they would use after graduating, the most common answer was massage (78.37%), followed by acupuncture (72.42%), osteopathy (57.94%), meditation/yoga/relaxation (45.24%), cupping (45.04%), and reflexology (44.84%). Only 1.79% of the students stated that they would not use any CAM practices (Table 3). Also, Massage (81.31%), acupuncture (75.75%), and osteopathy (65.41%) were considered as the most beneficial therapies of the CAM practices. These were followed by meditation/yoga/relaxation (56.67%), cupping (52.29%), and reflexology (51.09%). Of the participants, 1.59% did not believe any of the CAM practices would be useful (Table 3).

**Table 1.** The Participants' Attitudes and Beliefs.

Statements	Strongly agree		Agree		Unsure		Disagree		Strongly disagree	
	N	%	N	%	N	%	N	%	N	%
<b>Treatments that are not based on the scientific foundations of modern medicine are not valuable.</b>	52	10.32	58	11.51	162	32.14	105	20.83	127	25.20
<b>I believe there is sufficient scientific evidence regarding CAM.</b>	30	5.95	90	17.86	213	42.26	127	25.20	44	8.73
<b>The effects of CAM are due to the placebo effect.</b>	35	6.94	112	22.22	203	40.28	100	19.84	54	10.71
<b>My religious beliefs influence my attitude toward CAM practices.</b>	53	10.52	85	16.87	71	14.09	77	15.28	218	43.25
<b>After graduation, I will use CAM practices to treat my patients.</b>	145	28.77	165	32.74	112	22.22	58	11.51	24	4.76
<b>I have a positive opinion of CAM practices.</b>	161	31.94	153	30.36	119	23.61	50	9.92	21	4.17
<b>The patient's expectations, health beliefs, and values should be integrated into the care process.</b>	274	54.37	118	23.41	61	12.10	27	5.36	24	4.76



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Statements	Strongly agree		Agree		Unsure		Disagree		Strongly disagree	
<b>CAM practices include methods that can be beneficial in modern medicine.</b>	230	45.64	158	31.35	61	12.10	32	6.35	23	4.56
<b>CAM practices are a threat to public health.</b>	29	5.75	43	8.53	86	17.06	166	32.94	180	35.72
<b>Most CAM practices reveal people's potential for self-healing.</b>	100	19.84	188	37.30	160	31.75	43	8.53	13	2.58
<b>I believe that financial concerns are a priority in CAM practices.</b>	67	13.29	101	20.04	143	28.37	92	18.25	101	20.04
<b>CAM practices are therapies that do not require specific expertise.</b>	40	7.94	33	6.55	49	9.72	95	18.85	287	56.94
<b>CAM practices must be performed by trained practitioners.</b>	372	73.81	61	12.10	27	5.36	10	1.98	34	6.75
<b>CAM practices have no importance in PTR practices.</b>	31	6.15	23	4.56	47	9.33	129	25.60	274	54.36



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Statements	Strongly agree		Agree		Unsure		Disagree		Strongly disagree	
	N	%	N	%	N	%	N	%	N	%
<b>I believe CAM practices should be included in the PTR curriculum.</b>	209	41.47	124	24.60	95	18.85	43	8.53	33	6.55
<b>Interning in institutions where CAM practices are used would benefit me professionally.</b>	212	42.06	139	27.58	85	16.87	37	7.34	31	6.15
<b>It is not important for physiotherapists to possess sufficient and accurate knowledge about CAM.</b>	33	6.53	8	1.59	31	6.15	66	13.10	366	72.62
<b>I have sufficient knowledge about CAM.</b>	35	6.94	80	15.87	198	39.28	123	24.40	68	13.49

CAM: Complementary and alternative medicine, PTR: Physiotherapy and rehabilitation, N: number of participants, %: percent.



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**Table 2.** The sources of information about CAM Practices.

Source	N	%
Internet (web sites, news sites, etc)	326	64.68
Social environment (family, friends, etc.)	249	49.40
Health professionals	198	39.28
Internet (Social media; facebook, twitter, youtube etc.)	196	38.89
Books / Encyclopedia	167	33.13
Formal education/school	154	30.56
Internship	152	30.16
TV Shows	110	21.82
Newspaper / Magazine	92	18.25
Other	11	2.18

TV: Television, N: number of participants, %: percent.

**Table 3.** Knowledge about CAM of PTR students.

CAM Practices	Well-known CAM practices		The most used CAM practices after graduation		The most benefiest CAM practices	
	N	% (Order)	N	% (Order)	N	% (Order)
<b>Massage</b>	417	82.90 (1)	395	78.37 (1)	409	81.31 (1)
<b>Acupuncture</b>	385	76.54 (2)	365	72.42 (2)	381	75.75 (2)
<b>Cup application</b>	351	69.78 (3)	227	45.04 (5)	263	52.29 (5)
<b>Hirudotherapy (Leech application)</b>	296	58.85 (4)	130	25.79 (10)	189	37.57 (9)
<b>Meditation/Yoga/Relaxation</b>	280	55.67 (5)	228	45.24 (4)	285	56.66 (4)
<b>Osteopathy</b>	257	51.09 (6)	292	57.94 (3)	329	65.41 (3)
<b>Reflexology</b>	225	44.73 (7)	226	44.84 (6)	257	51.09 (6)
<b>Music therapy</b>	187	37.18 (8)	178	35.32 (7)	208	41.35 (7)
<b>Nutritional supplement</b>	179	35.59 (9)	158	31.35 (8)	202	40.16 (8)
<b>T'ai Chi/Qi Gong</b>	164	32.60 (10)	129	25.60	162	32.21
<b>Chiropractic</b>	151	30.02	144	28.57 (9)	187	37.18 (10)
<b>Phytotherapy</b>	108	21.47	77	15.28	119	23.66
<b>Therapeutic Touch / Reiki</b>	87	17.3	109	21.63	138	27.44
<b>Hypnosis</b>	62	12.33	65	12.9	95	18.89
<b>Other</b>	227	45.19	204	40.48	454	90.25
<b>None</b>	23	4.57	9	1.79	8	1.59

CAM: Complementary and alternative medicine, N: number of participants, %: percent.



#### 4. DISCUSSION

This study was conducted to investigate CAM-related knowledge, attitudes, and behaviors among PTR students. Our results indicate that majority of PTR students had a positive opinion about CAM practices and intended to use these practices in their treatment programs after graduation. The students' main source of information about CAM practices was the internet, and they were most knowledgeable about massage.

According to the questionnaire responses, approximately two-thirds of the participants perceived CAM practices in a positive light. The majority of participants stated that there are aspects of modern medicine in which CAM practices could be useful, and that these practices do not pose a threat to public health. Similarly, studies in the literature reported that the majority of university students have positive views of CAM practices (Ameade et al., pp.232-234, 2016; Solmaz ve Altay, 2019, pp. 388-391; Altan et al., 2014, pp.82-87; Araz et al., 2012, pp.242-246; Sönmez et al., 2018, pp.277-279). A possible factor in this finding is that this item of the questionnaire was a very general statement, and there were no questions about the disease-specific effectiveness or side effects of CAM practices. Moreover, including CAM practices such as massage and relaxation, which are evidence-based practices that have few complications and are included in the undergraduate curriculum, might have contributed to this result.

Participants in our study believed that CAM practices require expertise and must be taught by experts. In the literature as well, the predominant opinion is that CAM practices must be performed by professionals (Ameade et al., 2016, p.235; Altan et al., 2014, pp.87-88; Altınbaş ve İster, 2019, pp.57-58; Sönmez et al., 2018, p.280). Moreover, our study revealed that CAM practices were considered important in the science of PTR, but most of the students in the study did not believe they had sufficient knowledge of CAM practices. This indicates that the students believe CAM practices should be integrated into the science of physiotherapy. Therefore, we believe that including CAM practices in the PTR curriculum will increase the using CAM practices.

In our study, online resources were most commonly used to find information about CAM practices. The same finding was reported in studies in Turkey including health management students (Solmaz ve Altay, 2019, pp.388-390), medical students (Sönmez et al., 2018, pp.277-279), and nursing students (Şahin et al., 2019, pp.23-24). However, some studies reported conflicting results. In studies by Altan et al. (2014, pp.82-84) and Ameade et al. (2016, pp.231-234) including medical students and health sciences students, respectively, it was reported that TV was the most frequently used source to obtain information about CAM practices, whereas Sadeghi et al. (2016, pp.307-308) reported that family and friends were the most frequently used source. The higher ranking of online resources reported in more recent



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studies may be due to increased internet access among university students and the presence of more information about CAM practices in online platforms.

The students in our study were most knowledgeable about massage. Similarly, Altan et al. (2014, pp.82-84) reported that the most well-known CAM practice among medical students was massage. While there are varying results in the literature regarding the CAM practices that students are most knowledgeable about such as phytotherapy (Ameade et al., 2016, pp.231-234; Araz et al., 2012, pp.242-246), nutritional supplements (Doganay et al., 2018, pp.50-51), acupuncture (Sönmez et al., 2018, p.278), religious practice/prayer (Doganay et al., 2018, p.51), and diet (Ergin et al., 2011, p.140). Although not top ranked, massage practices were also listed among the most well-known CAM practices in other studies (Ameade et al., 2016, pp.233-234; Jamshed et al., 2016, pp.35-37; Doganay et al., 2018, p.51). We believe that these different results are a result of the different educational backgrounds of the students participating in these studies. It is expected that the most recognized CAM practice among the students who participated in our study would be massage, since it is included in the physiotherapy undergraduate education.

Following massage, the CAM practices that the students in our study were most knowledgeable about were acupuncture, cupping, and hirudotherapy. This may be associated with the fact that acupuncture is recognized in international platforms and are more evidence-based compared to other practices, while cupping and hirudotherapy are socioculturally acknowledged practices. The lack of knowledge about CAM practices reported by some of the participants in our study may be due to the inclusion of first-year students who had taken only a basic science courses. This suggests that incorporating evidence-based CAM practices with high levels of efficacy into the curricula can reliably increase physiotherapists' knowledge about CAM practices.

In terms of using CAM practices after graduation, massage was the method cited most often, which may also be attributed to their exposure to massage practices at the undergraduate level. Although hirudotherapy was the fourth most well-known CAM practice, it was among the lowest ranked in terms of use after graduation, which may be due to the nature of the practice. Osteopathy was one of the CAM practices the students considered most useful, but was not well known. Its high ranking in terms of perceived benefit may be related to the fact that it is a popular practice among physiotherapists.



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### **Limitations of the Study**

The study has certain limitations. Although all of the participants were students of physiotherapy, they all had different curricula in different universities, and this may have affected the results. Moreover, there was heterogeneity in terms of the students' year of study. This might influence their opinions about CAM practices. Based on our results, we recommend that future studies be performed with third- and fourth-year students, who have sufficient knowledge of vocational practices. Furthermore, because CAM practices vary widely, the students' views about specific practices should be assessed.

### **5. CONCLUSION**

Our study is important as it demonstrates the place of CAM practices in the PTR profession and the students' opinions of these practices. Online resources comprise the largest proportion of sources used by the students to learn about CAM practices. However, the validity and reliability of information obtained online cannot be ascertained. The authors thought that evidence-based CAM practices should integrate PTR curriculum, hereby students will be enhanced access of evidence-based CAM practices.

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