Use of complementary and alternative medicine and quality of life of cancer patients who received chemotherapy in Turkey

Zöhre Irmak[a,*], Özgür Tanrıverdi[b], Hilal Ödemiş[c], Derya Demir Uysal[a]

[a] Department of Nursing, Faculty of Health Sciences, Mugla Sıtkı Kocman University, Mugla, Turkey
[b] Department of Medical Onkology, Faculty of Medicine, Mugla Sıtkı Kocman University, Mugla, Turkey
[c] Education and Research Hospital, Mugla Sıtkı Kocman University, Mugla, Turkey

ABSTRACT

Objectives: This study aims to evaluate the frequency of use of CAM therapies among cancer patients, the types of CAM therapies they used, the demographic and clinical factors affecting their tendency to use CAM therapies, and the difference between quality of life of CAM user and non-user patients.
Design: This cross-sectional study was carried out between March and June 2016 in an education and research hospital located in Mugla, Turkey. A CAM use questionnaire, the European Organization for Research and Treatment of Cancer-Quality of Life Questionnaire (EORTC QLQ-C30 version 3.0) and the Nightingale Symptom Assessment Scale (N-SAS) were administered to 211 patients.
Results: Among all the participating patients, 46.4% were CAM users. The most commonly used CAM therapy was herbal products. The rate of CAM use was higher among the patients with a low education level (P = 0.004). No statistically significant difference was found between the quality-of-life scores of the CAM user and non-user patients.
Conclusion: Almost half of the cancer patients used CAM therapy, with the most commonly used CAM therapy being herbal products. Doctors/nurses should assess patients in terms of the CAM therapies they use to determine their possible side effects and drug interactions. Further research should be performed to determine the relationship between CAM therapy and quality of life.

1. Introduction

Cancer is a leading cause of death in the world,[1] and is the second leading cause of death in Turkey.[2] The main treatment modalities for cancer are radiation therapy, chemotherapy, surgery, biologic therapy, and goal-directed therapy. Each type of cancer requires a special treatment regimen. Treatment methods can be used alone or in combination with others, depending on the type of cancer and its stage.[3] The main goal of cancer treatment is to treat and control the cancer and to provide palliative care for it (to control symptoms to improve quality of life).[3] However, cancer and the conventional therapy applied to treat it can cause different symptoms, such as nausea, vomiting, mucositis, diarrhea, constipation, bone marrow suppression, alopecia, skin reactions, pain, fatigue and depression.[3,4]

Despite improvements in conventional therapy and higher survival rates, complementary and alternative medicine (CAM) therapies have been increasingly used in parallel with conventional therapy over the last few decades across the world.[5,6] Several studies have been conducted in different countries to determine the prevalence of CAM use. For example, it was found that 57.6% of cancer patients in the United States used at least one CAM type,[7] a study of cancer patients from 14 different countries in Europe determined the rate of CAM use as 35.9%[5]; and another study found that 83.5% of cancer patients in China used CAM therapies.[8]

Studies conducted in Turkey have reported the rate of CAM use in cancer patients to be between 36.0 and 71.5%.[9–14] Summary of studies conducted in Turkey on the use of CAM in cancer patients given in Table 1. Some traditional and complementary practices based on religious beliefs, philosophy and societal experiences have been used in the past and present in Turkey.[15] Particularly herbal products, religious practices (charms/praying)[13,15] and traditional practices such as cupping, leech and maggot therapy[16] have been used. People who are far away from modern life and have lower socioeconomic and education levels use CAM more frequently in Turkey.[13] The use and preference of CAM vary by religion, lifestyle and cultural structure.[17] Factors such as easy access to CAM products or local availability, lower prices, and

* Corresponding author at: Department of Nursing, Faculty of Health Sciences, Mugla Sıtkı Kocman University, 4800 Mugla, Turkey.
 E-mail address: zirmak@mu.edu.tr (Z. Irmak).

Table 1
Summary of studies in Turkey on the use of CAM in cancer patients.

Author, year	Subjects	Type of Instruments	Sample sizes	Preva-lence	Type of CAM	Reason for use	Results
Alger et al. 2005[9]	Outpatients and inpatients with cancer (two centre)	Face-to-face interviews A questionnaire	100	36.0%	Herbal therapy 67.4%, Stinging nettle or seed 57.6%	To fight the disease 18.9%	Female patients and individuals with lower educational level showed a tendency to use CAM methods more often
Er et al. 2008[10]	Outpatients with cancer (single centre)	Face-to-face interviews A questionnaire	268	43.0%	Herbs 64.9%	To fight the disease 46.1%	Younger age, higher educational status and advanced stage of the disease were associated with the use CAM
Can et al. 2009[11]	Outpatients with cancer (single centre)	Face-to-face interviews -The patients characteristic form -The Nighttingale Symptom Assessment Scale -The Functional Assessment of Cancer Therapy Scale	179	%71.5	Dietary supplements %88,3 Religious practices 68,2% Herbal supplements 37,4 %	To strengthen immune system 42.5% To keep blood cells high 40.8%	Gender, type of cancer diagnosis and education level were important factors to be considered in different CAM therapies, CAM use did not affect the patients'quality of life.
Durmaz & Öz. 2011[12]	Outpatients with cancer (single centre)	Face-to-face interviews An open-ended questionnaire	94	57.6 %	Herbal therapy and herbal essences Stinging nettles 40% Broccoli 35.3 %	To achieve physical well being 34.0% Relief from the side effects of conventional cancer treatment 18.0%	No statistically significant difference was found between CAM use and socio-demographic variables
Ceylan et al. 2002[13]	Inpatients with cancer (single centre)	Face-to-face interviews A questionnaire	305	60.1%	Herbal preparations %71.5	To feel of strengthening of body 17.2%	Born in villages, having less education and living in large families were more likely to use CAM practice
Kucukoner et al. 2013[14]	Outpatients and inpatients with cancer(single centre)	Face-to-face interviews A questionnaire	324	62.0 %	Herbal species 82.5% Stinging nettle or seed 39.8%	To eliminate the disease 47.3% To treat a compliant such as pain or fatigue 17.5%	Presence of metastatic cancer, receiving chemotherapy and long disease duration were found as main associated factors for CAM usage

people accepting these methods as beneficial as a result of previous experiences and beliefs about recovering by using CAM methods increase the use and preference of CAM.[11],[13],[17]

Studies report that the most common reasons for using CAM are to treat cancer or reduce risk of recurrence[5,6] to reduce the side effects of conventional therapy,[5] to strengthen the immune system,[6] to improve health[5,6] and to enhance quality of life.[3]

The meta-analyses of relevant randomized controlled trails conducted in recent years has shown that some CAM therapies have positive effects on disease symptoms and the quality of life of individuals with cancer. Studies have shown that acupuncture is effective on the management of cancer-based fatigue[18] and pain (more effective when used with drug therapy rather than conventional drug therapy administered by itself)[19] while physical activity has been found to be effective on increasing physical functions and the quality of life of patients who completed cancer treatment.[20] Similarly, the meta-analyses of relevant randomized controlled trials found that (i) yoga was effective for improving mental health (anxiety, depression and stress) of patients with cancer[21] and (ii) mindfulness-based therapy was effective for reducing anxiety and depression of patients with cancer.[22]

Guides recommending the administration of some evidence-based CAM therapies such as acupuncture, exercising, meditation and yoga along with conventional care or suggesting the administration of these methods at integrative oncology treatment centers were established.[23,24] The number of integrative oncology centers/integrative medical clinics that administer evidence-based complementary and integrative treatments in Europe[25] and in the United States[7,26] gradually increases at the present time. In Turkey, the Ministry of Health has issued and implemented the "Regulation on Traditional and Complementary Medicine Practices".[16] In addition, the Turkish Traditional and Complementary Medicine Institute was established. The aim of this institute is to ensure the use of evidence-based traditional and complementary practices/therapies integrated with conventional medicine.[27] Traditional and complementary medicine practice centers have also been established in university hospitals and other training and research hospitals in Turkey. These centers administer some of 15 traditional and complementary medicine practices provided in the regulation which include acupuncture, apitherapy, phytotherapy, hypnosis, leech and maggot therapies, homeopathy, chiropractic, cupping, mesotherapy, prolotherapy, osteopathy, ozone therapy, reflexology and music therapy.[16]

Cultural differences affect the method and frequency of use of CAM.[6,28] It has also been reported that different socio-demographic[28] and clinical features[6,8] affect CAM use. In recent years, only a limited number of studies have been conducted on this subject in Turkey using cancer patients from different geographical regions and examining the CAM therapies used by cancer patients, the frequency of use of CAM therapies, and the clinical and sociodemographic factors affecting CAM use.[12,13,14] The common results obtained in these studies indicate that the rate of CAM use is high and that the most commonly used CAM therapy is herbal products. It has also been reported that the majority of patients do not report the CAM therapy they use to health care providers.[10–12] However, although the clinical benefits of some CAM therapies have been proven, some herbal products may generate side effects on patients and interact with other medicines, including chemotherapy drugs.[24,29,30] Therefore, herbal treatments that interact with other medicines should not be used together with immunotherapy, chemotherapy and radiotherapy or before surgery. At the same time, cancer patients should also be evaluated before treatment begins to determine whether they use herbal medicines (Grade of recommendation: IB).[24] Today, knowing the CAM therapies used by patients, their reasons for using CAM and the factors affecting their tendency to use CAM has increasingly become important for both health personnel and patient health.

Cancer and its treatment result in many physical and psychological side effects and also reduce the quality of life of patients.[4] Quality-of-

life is a measure used to describe health-related physical, psychological and social well-being, and to assess the outcome of the relevant treatment.[31] One of the important goals of cancer treatment is to improve the quality of life of patients by controlling the symptoms.[3] Improving the quality of life is considered to be one of the primary reasons for using CAMs in the treatment of cancer patients.[32] Different studies about the effects of CAM therapies used for cancer patients on their quality of life report different results.[6,33] Therefore, it is important to determine the effects of CAM therapies, which are increasingly used for cancer patients, on quality of life. However, very little is known regarding difference between quality of life of CAM user and non-user patients. There is only one study in Turkey evaluating the quality of life in cancer patients who use and who do not use CAM.[11]

This study aims to evaluate the frequency of use of CAM therapies among cancer patients, the types of CAM therapies they used, the demographic and clinical factors affecting their tendency to use CAM, and the difference between quality of life of CAM user and non-user patients in western Turkey.

2. Method

This cross-sectional study was carried out between March and June 2016 in the chemotherapy unit of an education and research hospital located in Mugla, Turkey. The consecutively enrolled patients who received chemotherapy in the unit between these dates and who met the study criteria indicated below were included in the study. A previous study reported that the means standard deviation and quality of life (group 1 = 0.79 ± 0.58, group 2 = 1.10 ± 0.68) CAM users and non-users in cancer patients.[11] Using G*Power version 3.1 based on the ability of an independent samples t-test, at an alpha 0.05 (95% confidence level) and 0.80 power the requisite the sample size was calculated to be 134, though a total of 252 patients were enrolled. However, after the participants who met the inclusion criteria were given the informed consent form and verbally informed about its content, the study was carried out with 211 patients who agreed to participate in the study (41 patients refused to participate in the study for various reasons).

Study inclusion criteria were: a) being a patient aged 18 or over who has been diagnosed with cancer and has received chemotherapy (at least twice), b) being at any stage of the disease, c) being at least a primary school graduate, d) being able to complete written and oral data collection forms (those with very serious health conditions were not included in the study), e) agree to voluntarily participate in the study.

3. Ethical considerations

Ethical approval was obtained from the University Scientific Research and Publication Ethics Committee on February 8, 2016 (protocol no. 5). Permission to conduct the study was also obtained from the education and research hospital administrators. All patients were given information about the study, and written informed consent was obtained from all patients.

4. Data collection

The data were collected by all researchers using the following forms.

1. Demographic, clinical, and CAM use question form: A two-part question form was developed to obtain information about patients' demographics, clinical features and properties of CAM therapies they used. The first part includes 12 questions about patients' socio-demographics and clinical characteristics. The second part, which was prepared in line with previous studies,[5,6,34] consists of 9 questions on the CAMs used by the patients. A list of 24 CAM options (including natural products, mind and body interventions, alternative medicine systems)

was prepared based on the literature to determine the CAM therapies used by the CAM-user patients.[6,11,24,34,35] All patients filled out the first part of the form, but only the CAM-user patients filled out the CAM list and the second part of the form. Opinions of three experts were obtained for the validity of the question form prepared in accordance with the objectives of the study.

Two valid and reliable scales were used to determine the quality of life of the patients.

2. The European Organization for Research and Treatment of Cancer-Quality of Life Questionnaire (EORTC QLQ-C30 version 3.0): The Turkish version of the EORTC QLQ-30 scale, which has been approved by the European Organization for Research and Treatment of Cancer (EORTC), was used to determine the quality of life of the patients. The scale consists of a total of 30 items, including 6 single-items (dyspnea, insomnia, loss of appetite, constipation, diarrhea, and financial difficulty) and 24 items within five functional scales (physical, role, cognitive, emotional, and social), three symptoms scales (fatigue, nausea-vomiting, and pain) and one general well-being scale. Each scale includes more than one item. High scores on the functional and general well-being scales represent good quality of life, whereas high scores on the symptoms indicate a high level of problems in a patient's health condition. In this study, Cronbach's alpha value was found to be 0.91.

3. Nightingale Symptom Assessment Scale (N-SAS): The Nightingale Symptom Assessment Scale (N-SAS) is a quality-of-life scale developed by Can and Aydıner (2011) to address the symptoms/problems frequently reported by cancer patients receiving chemotherapy.[36] The scale consists of 38 items within three subscales: physical well-being (20 items), social well-being (8 items) and psychological well-being (10 items). High scores indicate that patients have a bad symptom experience or poor overall quality of life due to disease/treatment. The scale showed high internal reliability. Cronbach's α for subscales varied between 0.81 and 0.87 and was 0.93 for the tool. In this study, Cronbach's alpha value was also found to be 0.93.

The questionnaire, CAM list and scales were either filled by the researchers face-to-face or by patients during or after treatment based on the preferences of patients who applied to hospital unit to receive chemotherapy. The questionnaires were collected before patients left the unit. Two part of the questionnaire, the CAM list, and questions and items in the scales were completed in approximately 30 min while the first part of the questionnaire and other scales were completed in approximately 20 min.

5. Statistical analysis

SPSS version 19.0 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp) was used for the statistical analysis of the data obtained in the study. Descriptive statistics (mean, number, and percentage) were used to determine patients' demographics, clinical features and properties of the CAM therapies they used. The chi-square test was used to compare demographic and clinical characteristics of the CAM user and non-user patients. As the data were not normally distributed, the Mann-Whitney U test were used to compare the quality of life of CAM user and non-user patients. A p value of < 0.05 was regarded as statistically significant.

6. Results

The mean age of the patients was 60.31 ± 11.32 years (ranging between 32 and 83 years). Of the patients, 54% were ≥60 years old, 50.2% were female, 82.9% were married, 76.8% were elementary/secondary school graduates, 53.1% had a middle/high income, 60.2% were city-dwellers, 90.0% were unemployed/retired (88.6% of the women were unemployed), and 98.6% had health insurance. According to their clinical features, the mean time of diagnosis was 25.70 ± 27.55 months, where 60.7% of the patients suffered from

Table 2

Demographic and clinical characteristics of CAM users and nonusers.

	CAM users		CAM nonusers		χ^2	P value
	n	%	n	%		
Gender						
Famele	52	49.1	54	50.9	0.584	0.445
Male	46	43.8	59	56.2		
Marital status						
Married	78	44.6	97	55.4	1.448	0.229
Single/divorced	20	55.6	16	44.4		
Education level						
Elementary/secondary school	84	51.9	78	48.1	8.197	0.004
High school/University	14	28.6	35	71.4		
Age						
< 60	48	49.5	49	50.5	0.667	0.414
≥ 60	50	43.9	64	56.1		
Income level						
Low	52	52.5	47	47.5	2.772	0.096
Middle/high	46	41.1	66	58.9		
Settlement						
Rural/village-dwellers	44	52.4	40	47.6	1.977	0.160
Urban/city-dwellers	54	42.5	73	57.5		
Employment status						
Employed	11	52.4	10	47.6	0.330	0.565
Unemployed/retired	87	45.8	103	54.2		
Cancer type						
Breast	29	42.6	39	57.4	5.718	0.221
Colorectal cancer	20	58.8	14	41.2		
Lung cancer	9	31.0	20	69.0		
Gynaecological cancers	14	48.3	15	51.7		
Other	26	51.0	25	49.0		
Location of disease						
Primary disease	40	42.6	54	57.4	1.033	0.310
Metastatic disease	58	49.6	59	52.2		
Duration of diagnosis						
< 12 months	22	36.7	38	63.3	5.641	0.060
1-4 years	61	47.7	67	52.3		
≥ 5 years	15	65.2	8	34.8		

Table 3

Type of CAM therapies used (n = 98).[a]

CAM Therapies	n	%
Natural products		
Morel/reishi mushroom	11	7.0
Propolis	18	11.5
Bee Pollen	5	3.2
Black cumin (boiling/oil)	13	8.3
Stinging nettle tea	16	10.2
Locust bean	5	3.2
Centaury oil	10	6.4
Ginger	5	3.2
Turmeric	4	2.5
Clove	2	1.3
Vitamin, mineral supplement	4	2.5
Levant storax	6	3.8
Shark cartilage	2	1.3
Artichoke juice	3	1.9
Donkey milk	2	1.3
Mind-body therapies		
Exercise	23	14.6
Yoga	3	1.9
Pilates	3	1.9
Praying	22	14.0
Total	157	100.0

[a] More than one CAM use has been reported. Therefore, percentages are given according to the relevant item.

cancer for 1–4 years. Among the patients 32.2% had breast cancer, 16.2% were diagnosed with colorectal cancer, and 55.5% had metastasis. Save for education level, no statistically significant difference was found between the demographic and clinical characteristics of CAM user and non-user patients. The rate of CAM use was found to be higher in primary/secondary school graduate patients (P = 0.004) (Table 2).

A total of 46.4% of the patients were CAM users. The most commonly used herbal products were propolis (18.4%), stinging nettle tea (16.3%), black cumin (13.2%), mushroom (11.2%) and centaury oil (10.2%). The most commonly used mind-and-body therapy was exercise (23.5%) (Table 3).

The patients reported the reasons for using CAMs as follows; preventing disease progression (29.9%), strengthening immune system (24.2%), reducing side effects of chemotherapy/conventional treatment (22.3%), maintaining psychological well-being (13.4%), and supporting treatment/synergic effect of therapy (10.2%). Morel/reishi mushroom, stinging nettle tea, centaury oil, other herbal products and yoga were most frequently used to prevent disease progression. Propolis and black cumin were most frequently used to strengthen the immunity system, and exercising and praying were performed to maintain psychological well-being. Herbal products and praying were used to reduce the side effects of chemotherapy (Table 4).

The mean time of CAM use was 17.48 ± 16.18 months, where 62.2% of the patients had used CAMs for more than 13 months. A total of 88.8% of the patients reported that they used CAMs 1–2 times a day. Of the patients, 25.5% stated that CAM use provided psychological relaxation, 21.4% stated that CAM use prevented disease progression, 16.3% stated that CAM use strengthened the immune system, 13.3% stated that CAM use decreased fatigue, and 10.2% stated that CAM use

relieved pain. Although all of the patients (100%) reported experiencing no possible side effects of CAM therapy used, it should be noted that this result is based on patient statements considering that the most frequently used CAM therapy was using herbal products. Furthermore, 61.2% of the patients reported that the doctor/nurse did not know the CAM therapy they used, and 53% of the patients stated that they had received information and suggestions about CAMs from their friends/relatives. A significant majority (92.8%) of the patients were satisfied/very satisfied with CAM use, but 82% of the patients thought conventional treatment was more effective than CAM therapies (Table 5).

No statistically significant difference was found between the CAM users' and CAM non-users' mean scores on the general well-being, functional and symptoms subscales of the EORTC QLQ-C30 quality-of-life scale. Similarly, no statistically significant difference was found between the CAM users' and CAM non-users' mean scores on the N-SAS and its physical, social and psychological well-being subscales (Table 6).

The variables such as income level and disease loci were found to affect the quality of life of the patients. When the patients' mean scores on the EORTC QLQ-C30 scale were compared, patients with a middle/high income were found to have better general (^{Z}MWU = −2.294; P = 0.022), physical (^{Z}MWU = −4.116; P = 0.000), role (^{Z}MWU = −2.524; P = 0.012), and social (^{Z}MWU = −3.861; P = 0.000) well-being, and to experience less symptoms, such as fatigue (^{Z}MWU = −3.653; P = 0.000), pain (^{Z}MWU = −3.931; P = 0.000), loss of appetite (^{Z}MWU = −2.394; P = 0.017. When the patients' mean scores on the EORTC QLQ-C30 scale were compared, patients with metastasis were found to have poorer general (^{Z}MWU = −2.170; P = 0.030) and physical (^{Z}MWU = −3.427; P = 0.001) well-being, and to experience more symptoms, such as fatigue (^{Z}MWU = −2.734; P = 0.006), pain (^{Z}MWU = −3.525; P = 0.000), dyspnea (^{Z}MWU = −2.696; P = 0.007), and loss of appetite (^{Z}MWU = −2.108; P = 0.035).

7. Discussion

In this study which was conducted in western Turkey, 46.4% of the patients used any type of CAM. Studies conducted in different regions of Turkey have reported the rate of CAM use in cancer patients to be between 36.0 and 71.5%.[9–14] Chemotherapy is one of the most important factors affecting the use of CAM therapies. Patients usually start

Table 4
The frequency of the used CAM based on the reported treatment goals (n = 157).[*]

Reasons for using CAMs	Morel/reishi mushroom	Propolis	Black cumin	Centaury oil	Stinging nettle tea	Other natural products	Praying	Natural products + praying	Exercise + praying	Natural products + exercise	Yoga	Pilates	Exercise	Total n	Total %
Preventing disease progression	8	2	2	4	9	10	2	2 + 2	–	2 + 2	2	–	–	46	29.9
Strengthening immune system	3	8	7	3	3	6	–	–	–	2 + 2	–	1	3	39	24.2
Reducing side effects of chemotherapy	–	5	2	–	3	6	4	3 + 3	1 + 1	1 + 1	–	1	3	35	22.3
Maintaining psychological well-being	–	–	2	2	–	3	–	1 + 1	4 + 4	1 + 1	1	1	1	21	13.4
Supporting treatment	–	3	–	1	1	1	2	–	3 + 3	–	–	–	2	16	10.2
Total n	11	18	13	10	16	26	8	6 + 6	8 + 8	6 + 6	3	3	9	157	100.0
%	7.0	11.5	8.3	6.4	10.2	16.6	5.1	3.8 + 3.8	5.1 + 5.1	3.8 + 3.8	1.9	1.9	5.7	100.0	

* More than one CAM use and reasons has been reported. Frequencies are given according to the relevant item.

Table 5
Characteristics regarding CAM use (n = 98).

	n	%
Duration of use (17.48 ± 16.18 months)		
< 6	28	28.6
6-12	9	9.2
≥ 13	61	62.2
Frequency of use		
1-2 times a day	88	88.8
1-2 times a week	10	10.2
The effects of using CAMs		
Prevented disease progression / shrunk tumor size	21	21.4
Strengthened immune system	16	16.3
Reduced fatigue	13	13.3
Relieved pain	10	10.2
Provided psychological relaxation	25	25.5
No answer/do not know	13	13.3
Side effect experience		
None	98	100.0
Whether the doctor/nurse knows that the patient receives(d) CAM therapy		
Yes	38	38.8
No	60	61.2
Information source		
Friends / relatives	52	53.0
Media/internet	42	43.0
Doctor	4	4.0
Satisfaction with CAM		
Very satisfied	17	17.3
Satisfied	74	75.5
Less satisfied	7	7.2
Effective treatment (n = 211)		
Conventional	173	82.0
CAM/conventional	38	18.0

using CAMs to reduce the side effects of chemotherapy.[37] Geographical area and culture also affect the frequency and method of CAM use.[6,28,38] Different results were obtained in studies conducted in different countries. Studies conducted in the United States report the rate of CAM use in cancer patients to be between 34.0% and 57.6%.[7,39,40] This ratio was reported as 37.9% in Italy[34] and as 41.3% in Australian.[41] Studies conducted in Asia report higher ratios of CAM use in cancer patients, indicating that 83.5% of the cancer patients in China[8] and 57.4% of the breast cancer patients in South Korea[6] use at least one type of CAM.

This study found that most of the patients (67.6%) have used herbal products. Previous studies conducted in Turkey also report that patients mostly use dietary supplements/herbal products.[9–14] However, there are differences in the most commonly used dietary supplements/herbal products, with one study reporting them as stinging nettle, broccoli and raspberry,[12] as stinging nettle, pollens and thyme in another study,[13] and as green tea, linden and stinging nettle in another.[11] In the present study, the most commonly used herbal products/natural products were found to be propolis (18.4%), stinging nettle (16.3%), black cumin (13.2%), mushroom (11.2%), centaury oil (%10.2), and levant storax (6.1%). These products other than the black cumin either grow or are produced in Mugla. The last two products were not reported in the previous studies conducted in Turkey.[9–14] The use of CAM therapies may be related to their availability in a particular geographical area.[38] Centaury oil and levant storax are still widely used as traditional treatments for some diseases in Mugla, where this study was conducted, because these plants are grown in this region, and the people of this region believe in their therapeutic effects. Previous studies conducted in both western[5,33,34,40,42] and eastern countries[8,43] obtained similar results in this regard, reporting herbal products as the most commonly used CAM. However, one of the more recent studies in Europe reported the most commonly used CAM to be acupuncture (39.1%) and homeopathy (39.1%).[25] Turkish patients generally tend to use herbal products can be explained by the fact that they have more knowledge

Table 6
Symptoms related with chemotherapy and quality of life in CAM users and non-users (n = 211).

	CAM users (n = 98)		CAM nonusers (n = 113)		Z_{MWU}	P
	$\bar{X} \mp SD$		$\bar{X} \mp SD$			
EORTC QLQ-C30 subscales						
Global health status	57.05	19.12	56.12	19.44	− 0.647	0.518
Functionning scales						
Physical function	62.92	21.02	66.31	23.85	− 1.458	0.145
Role function	70.74	24.41	71.23	27.20	− 0.425	0.671
Emotional function	64.37	23.50	65.78	25.54	− 0.570	0.569
Cognitive function	72.44	19.60	74.77	24.91	− 1.397	0.162
Social function	73.46	21.38	70.50	27.18	− 0.107	0.915
Symptom scales/items						
Fatigue	42.74	20.63	42.47	24.27	− 0.489	0.625
Nausea and vomiting	20.91	25.02	19.61	24.82	− 0.478	0.633
Pain	35.03	25.38	33.18	27.68	− 0.731	0.465
Dyspnea	18.36	22.51	18.58	25.94	− 0.382	0.702
Insomnia	33.33	29.11	30.09	33.61	− 1.111	0.267
Appetite loss	27.55	28.32	30.67	30.25	− 0.709	0.478
Constipation	25.85	32.99	28.61	32.99	− 0.650	0.516
Diarrhea	9.86	22.04	11.79	24.36	− 0.654	0.513
Financial difficulties	37.75	30.88	38.64	33.20	− 0.011	0.992
N-SAS subscales						
Physical well-being	1.14	0.73	1.13	0.64	− 0.382	0.702
Social well-being	0.90	0.78	0.94	0.79	− 0.324	0.746
Psychological well-being	1.75	0.83	1.69	0.91	− 0.412	0.680
N-SAS total score	1.26	0.66	1.25	0.66	− 0.010	0.992

about herbal products than other mind-and-body practices and alternative medicine treatments, and that they have easier and cheaper access to herbal products than other CAMs. At the same time, patients also believe that herbal products are more natural and safer than other CAMs.[12] Although some of the herbal products used by the patients who participated in this study can be bought from pharmacies, they are generally obtained from markets, herbalists or websites, and the vast majority of these products are not licensed by the Ministry of Health. Taking into consideration the potential side effects and drug interactions of herbal products,[30] it is important for healthcare providers to evaluate patients' CAM use behaviors.

Previous studies have reported that the effect of education on CAM use varies. Some studies have shown that the rate of CAM use is higher in individuals with a high level of education,[5,8,34] whereas a small number of studies have shown that education does not affect CAM use.[6,39] Studies conducted in Turkey to assess the effect of education on the use of CAM showed different results. A study indicated that individuals with higher education levels have a higher rate of using CAM,[10] but the relevant literature has studies suggesting that no significant difference is present between the education levels and use of CAM,[11,12,14] and that individuals with lower education levels have a higher rate of using CAM.[9,13] Although the number of participant patients with high levels of education was low in the present study, the ratio of low educated patients (primary/secondary school graduates) using CAMs (51.9%) was found to be higher than the ratio of high educated patients using CAMs. People with lower socioeconomic and education levels use CAM more frequently in Turkey.[11] This study found that participants with lower education levels had lower economic status ($\chi^2 = 8.627$, P = 0.003). Religion, lifestyle, cultural structure and beliefs about getting better with the use of CAM affect the use and preference of CAM.[17] The type of CAM method used can differ based on education and economic levels.[11] In this study, 87.7% of the participants who used herbal products had low education levels. Although 64.7% of the mind- and -body practices were used by people with low education levels, 58.8% of these practices included praying. People with lower education levels prefer using CAM practices including easily accessible, cheaper and mostly locally grown and used herbs/natural products as well as easy-to-access and cost-free mind- and -body practices believing that they would be helpful, which may have increased the rate of their using CAM practices. However, mind- and -body practices are not widely known in the culture. Patients with higher education levels have an intellectual approach, and more income and resources, thus easily access to scientific information from the Internet and other scientific resources in Turkey. In addition, they generally prefer mind- and -body practices[11] and other evidence-based practices that they trust. However, centers that administer traditional and complementary practices/treatments are not common in Turkey yet, and the number of health professionals performing these practices is also inadequate. The hospital where the study was conducted does not have a traditional and complementary medicine center. Therefore, people with higher education levels may use CAM methods at a lower rate.

One of the reasons for using CAM is to increase quality of life.[44] It is important to determine patients' experience with their diseases and treatments in terms of understanding their health conditions.[45] Randomized controlled studies involving patients who use different CAM therapies[46,47] have shown that CAM therapies increase the quality of life of cancer patients. The cross-sectional and longitudinal design studies examining the quality of life of CAM users and non-users have reported different outcomes. The majority of studies have shown that CAM use does not affect quality of life,[6,11,41] and in some cases, even deteriorates it.[39] Only one study states that patients who use dietary supplements have a better quality of life than those who do not use dietary supplements.[33] The present study found no significant difference between quality-of-life and symptom experience scores of CAM users and non-users. It is important to determine the difference between quality of life of CAM users and non-users.

This study found that patients used black cumin seeds and propolis to strengthen the immunity system. They might have also experienced the effects of these two products. Black cumin seeds or black cumin seed oil have been used as a spice or for a therapeutic purpose for years.[48] Some studies conducted using black cumin seeds oil or extract have shown analgesic, anti-inflammatory,[48] immunosuppressive and immunomodulator.[49]

Similarly, propolis has been used in many countries due to its beneficial effects for years.[50] Honey therapy was effective for decreasing the incidence of oral mucositis after radiotherapy/chemotherapy.[51] Studies that examined the effects of propolis have found

that (i) the propolis and pollen extracts have antioxidant and anticancer effects,[52] and (iii) the ethanolic extract of propolis (EEP) have anti-inflammatory activity.[50]

The present study found that high-income patients had better quality of life and experienced less symptoms caused by the disease/treatment. High-income patients have more resources to get more treatment options. Likewise, low-income patients benefit less from treatment services and are less satisfied with conventional treatment they receive.[28] It is possible that the relatively low socioeconomic inequality and free health care services can lead to the better utilization of treatment services by low-income patients.

The present study found that patients with metastasis experienced more symptoms and had poorer quality of life. Another study also reported that patients with metastasis experienced more symptoms and as the symptoms caused by the disease/treatment increase, the quality of life of patients is more impaired.[11] At the same time, patients with more symptoms and patients in terminal stages of the disease are more inclined to use CAMs.[6,33]

8. Limitations

This study was conducted in just one of the health institutions located in a province of Turkey. Patients in the study sample were not selected with a specific probability (non-random sample). Patients who met the study inclusion criteria were included in the study sample. Therefore, the study results cannot be generalized to all patients.

9. Conclusion

This study found that about half of the cancer patients receiving chemotherapy used CAMs, that the most commonly used CAM therapy was herbal products, that education was a factor affecting patients' CAM use behaviors, that there was no significant difference between quality-of-life scores of CAM users and non-users. Considering that herbal products are the most commonly used CAM therapy, doctors/nurses should assess patients in terms of using CAM therapies to determine their possible side effects and drug interactions. The CAMs proper to patients' interests and needs can be recommended only after reviewing their benefits, harms and evidence of efficacy from reliable sources/literature. In addition, prospective design or longitudinal studies, particularly randomized controlled clinical trials, should be performed to determine the relationship between CAM therapy and quality of life.

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Conflict of interest

The authors declare no conflicts of interest that may have influenced this work.

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