

Łukasz Pietrzyński<sup>1</sup>, Dariusz Pysz-Waberski<sup>1</sup>, Tatiana Pietrzyńska<sup>2</sup>, Michał Kliber<sup>1</sup>, Iwona Gisterek<sup>1</sup>

<sup>1</sup>Department of Radiotherapy and Clinical Oncology, Medical University of Silesia, Poland

<sup>2</sup>Group of Health Care Facilities in Czeladź, Department of Palliative Care, Poland

# The use of complementary and alternative therapy by advanced cancer patients receiving palliative care at home

## Abstract

**Introduction:** The purpose of this study was to evaluate the use of complementary and alternative therapies (CAT) by palliative care patients treated at home in Poland.

**Patients and methods:** A total of 241 adult patients with advanced or metastatic cancer who were qualified for palliative care provided at home filled out the CAT screening tool. Data were analysed to assess CAT use association with several variables.

**Results:** 82.16% of individuals who completed the survey declared using CAT at least once in the last 12 months. Self-help practices were the most used CAT category (74.47%), it was followed by herbal medicine and dietary supplements (62.66%) and visits to CAT providers (41.91%). CAT use was more prevalent among women, patients with basic education, and patients currently married and widowed. The most common reason pointed for using CAT was to improve well-being (35.4%). 50.5% of CAT users declared that they find used therapy helpful or very helpful. The study revealed an exceptionally high prevalence of spiritual practices (self-prayer, spiritual healing) in comparison to previous European studies conducted among the cancer patient population.

**Conclusions:** The study indicated that usage of CAT among advanced cancer patients treated at home is significant, with a higher prevalence of spiritual practices than reported in previous studies among cancer patients in Europe.

*Palliat Med Pract 2022; 16, 2: 108–116*

**Key words:** cancer, complementary and alternative therapy, palliative care, patient

## Address for correspondence:

Łukasz Pietrzyński

Department of Radiotherapy and Clinical Oncology; Medical University of Silesia, Poland

e-mail: lpietrzynski@gmail.com



Palliative Medicine in Practice 2022; 16, 2, 108–116

Copyright © Via Medica, ISSN 2545–0425, e-ISSN: 2545–1359

DOI: 10.5603/PMPI.2022.0008

This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially.

## Introduction

According to the World Health Organization (WHO), cancer remains the second main cause of death worldwide. It is projected that in 2030 over 13 million people around the globe will die because of different kinds of tumours. Despite the development of evidence-based medicine and the increasing budget spent on medical care by governments of middle and high-income countries, many patients must face an unfavourable prognosis. Disregarding the details of this situation, it is not a surprise that patients suffering from advanced, metastatic cancer attempt to use complementary and alternative therapies (CAT).

CAT is defined as a group of diverse medical and health care systems, practices, and products that are not generally considered a part of conventional, evidence-based medicine. Enthusiasts of this kind of therapy encourage its usage by claiming that CAT has fewer side effects and is more natural than the conventional medical approach. On the other hand, CAT has numerous opponents who emphasize that despite extensive use, there is a paucity of data available to indicate whether these therapies are safe and effective [1, 2].

This study aimed to evaluate the use of CAT among patients with locally advanced or metastatic cancer receiving palliative care at home in the region of Silesia, Poland. There are not many studies comprehensively analysing this subject, and none of them was carried out on the patient population of Central Europe. This study presents not only the prevalence of CAT use but also patients' motivations and their assessments of CAT effectiveness.

## Patients and methods

In this observational study, the data was collected from a group of 241 adult patients with advanced or metastatic cancer. The survey was conducted among the patients of 3 home hospices in the Silesian Province of Poland. The questionnaire used in the study was the International Questionnaire to measure the use of Complementary and Alternative Medicine (I-CAM-Q) [3], developed as an international measurement instrument in the EU population. This survey model has been validated and used in many European countries before [4–6].

The questionnaire consists of questions about the patient's visits to CAT providers, use of herbal medicine and dietary supplements as well as the use of self-help practices (self-prayer, relaxation, breathing exercises) in the last 12 months. Patients were also asked to specify the reasons for CAT use and their subjective

**Table 1. Socio-demographic characteristics of the study participants**

Characteristic gender	Number	Per cent
Women	126	52.28%
Men	115	47.72%
<b>Age</b>		
< 51	5	2.07%
51–60	34	14.11%
61–70	115	47.72%
71–80	65	26.97%
≥ 81	22	9.13%
<b>Education level</b>		
Basic	26	10.79%
Secondary education	151	62.66%
Tertiary education	64	26.56%
<b>Place of residence</b>		
Village	15	6.22%
Town < 50 thousand	67	27.80%
Town 50–200 thousand	154	63.90%
Town > 200 thousand	5	2.07%
<b>Marital status</b>		
Divorced/separated	18	7.47%
Married	93	38.59%
Single	31	12.86%
Widowed	99	41.08%

assessment of the helpfulness of the used therapy. Background questions regarding demographic data, cancer type and its stage were added.

The I-CAM-Q questionnaire was translated into Polish using a forward-back translation procedure according to the European Organization for Research and Treatment of Cancer (EORTC) recommendations [7]. The Research team compared the received translation with the original questionnaire and eliminated all inconsistencies by repeating the procedure until a satisfactory result was achieved. The questionnaire was tested on a group of 10 patients. The feedback received was used to make necessary corrections and acknowledge the translation's final version. All participants who were surveyed in this study were cancer patients admitted to home hospice care facilities between 21st July 2018 and 21st September 2019. At the time of admission, they were asked to fill in the CAT screening tool questionnaire. There were no patients who refused to undergo a CAT screening tool and all of them agreed to participate in the study. The Bioethi-

**Table 2. Types of complementary and alternative therapies use**

	Total (n = 241)		Women (n = 126)		Men (n = 115)	
Total CAM	82.16%	198	87.30%	110	76.52%	88
Visits to CAM providers	41.91%	101	46.83%	59	36.52%	42
Use of herbal medicine and dietary supplements	62.66%	151	65.87%	83	59.13%	68
Use of self-help practices	74.69%	180	75.40%	95	73.91%	85
Total CAM excl. herbal medicine and dietary supplements	75.10%	181	82.54%	104	67.83%	78
Total CAM excl. self-help practices	67.63%	163	70.63%	89	64.35%	74
<b>Visits to CAM providers</b>	<b>Total (n = 101)</b>		<b>Women (n = 59)</b>		<b>Men (n = 42)</b>	
Massage	7.92%	8	8.47%	5	7.14%	3
Chiropractic	0.99%	1	0.00%	0	2.38%	1
herbalist	9.90%	10	5.08%	3	16.67%	7
Osteopathy	1.98%	2	1.69%	1	2.38%	1
Acupuncture	9.90%	10	8.47%	5	11.90%	5
Homeopathy	18.81%	19	18.64%	11	19.05%	8
Spiritual Healer	64.36%	65	47.46%	28	88.10%	37
Psychologist/psychiatrist	6.93%	7	10.17%	6	2.38%	1
Other	0.99%	1	1.69%	1	0.00%	0
<b>Herbal medicine and dietary supplements</b>	<b>Total (n = 151)</b>		<b>Women (n = 83)</b>		<b>Men (n = 68)</b>	
Herbal medicine	68.21%	103	80.72%	67	52.94%	36
Vitamins and minerals	93.38%	141	91.57%	76	95.59%	65
Homeopathic remedies	21.19%	32	20.48%	17	22.06%	15
Other remedies	8.61%	13	10.84%	9	5.88%	4
<b>Self help practices</b>	<b>Total (n = 180)</b>		<b>Women (n = 95)</b>		<b>Men (n = 85)</b>	
Meditation	5.17%	9	5.43%	5	4.88%	4
Yoga	5.17%	9	6.52%	6	3.66%	3
Relaxation	8.62%	15	9.78%	9	7.32%	6
Breathing	6.90%	12	7.61%	7	6.10%	5
Visualization	5.75%	10	8.70%	8	2.44%	2
Self-prayer	90.80%	158	90.22%	83	91.46%	75
Other	1.72%	3	2.17%	2	1.22%	1

cal Commission did not consider the study a medical experiment, and therefore ethical approval was not required for the study. Written informed consent was obtained from each patient before participation in the study. The study was conducted according to the Declaration of Helsinki.

After completion, the anonymized raw data were analysed. The statistical analyses were performed using STATISTICA 10.0 PL (StatSoft, Poland, Cracow). A descriptive statistic, as well as multiple logistic

regressions modelling of CAT both in general and each by a specific category as a function of several predictors to estimate the odds ratios (ORs) and 95% confidence intervals (95% Cis that impacted the CAT use), were conducted.

## Results

The cohort was 126 female (52.28%) and 115 male (47.72%), in the age range from 46 to 92 years

(mean 68.14 years, median 67 years). Detailed patient demographics are summarized in Table 1. Out of 241 advanced cancer patients studied, the location of the primary tumour was as follows: 67 (27.8%) breast, 48 (19.9%) prostate, 58 (24%) colon, 41 (17%) lung, 10 (4.3%) kidney, 9 (3.7%) stomach, in 8 patients (3.3%) other or unknown primary tumour location. Out of 241 patients, 198 (82.16%) patients (87.3% of women, 76.5% of men) reported having used some form of CAT in the last 12 months. Total CAT use includes visits to CAT providers, use of herbal medicine and dietary supplements and use of self-help practices (Table 2).

The CAT category that was most used within 12 months before the survey was self-help practices (74.47% of the population sample). The large majority (90.80%) of this group consisted of patients who declared using self-prayer as a form of therapy. Self-help practices included also meditation, yoga, relaxation and breathing exercises as well as visualization therapy (Table 2). However, when the prayer subcategory was excluded from self-help practices the user percentage of this category decreased from 74.47% to only 9.5% of the study population. Herbal medicine and dietary supplements were used by 62.66% of the population sample. The most common interventions in this category were vitamins and minerals, herbal medicines, and homoeopathic remedies (93.38%; 68.21%; 21.19% respectively) (Table 2).

CAT providers had been consulted by 41.91% of the population sample. The most common treatments of this group were spiritual healing, homoeopathy and acupuncture (64.36%; 18.81%; 9.9% respectively) (Table 2).

### **The use of complementary and alternative therapies**

Statistical analysis (logistic regression) was conducted to examine factors that impacted the CAT use, both in general and each by a specific category (Table 3). The CAT use was more common with a particularly high odds ratio among female patients (OR = 2.11, 95% CI 1.07–4.16) and patients who were married (OR = 1.56; 95% CI 1.94–2.51). Visits to CAT providers were more common with a particularly high odds ratio among patients who were widowed (OR = 5.98, 95% CI 3.23–11.06). Additionally visits to CAT providers were more common among occupants of cities 50,000–200,000 inhabitants (OR = 1.76; 95% CI 1.02–3.03). The use of herbal medicine and dietary supplements was more common among patients who were widowed (OR = 1.82; 95% CI 1.05–3.14). The

use of self-help practices was more common among patients with basic education (OR = 1.15; 95% CI 1.23–2.41).

### **Purpose of complementary and alternative therapy use**

In relation to each CAT category, the respondents were asked about the purpose of using CAT (Table 4). Most of the study participants declared using complementary and alternative therapies in general to improve their well-being (35.35%), to treat a long-term health condition (24.24%), to live longer (17.68%), to treat an acute illness (15.66%), to be convinced that everything has been done to beat cancer (7.07%).

### **Perceived degree of helpfulness**

Patients were further asked about the perceived degree of the helpfulness of used complementary and alternative therapies (Table 5). The respondents most rated their CAT as helpful (30.30%); it was followed by a little helpful (23.23%), very helpful (20.20%), possibly helpful (15.15%) and not helpful (11.11%).

## **Discussion**

The use of CAT is common but varies depending on the country and characteristics of the patient population, with the use range of 27–87% [8, 9]. However, the prevalence of CAT use among cancer patients receiving palliative care has not been yet well investigated and differed from the cancer patient population; the trend toward more frequent use of CAT after cancer diagnosis and in advanced cancer is already known from the previous studies [13, 14].

Although, the results of this study showed one of the highest previously reported in the literature prevalence of general CAT use (82.16%) [10, 11] when the study cohort was analysed excluding the category of self-help practices (dominated by self-prayer) it was reported that only 72.19% of participants used at least one type of CAT. The present study results are like previous studies of CAT use among cancer patients [10, 12, 13].

Previous studies regarding CAT use among cancer patients showed variable results in the field of spiritual and self-help practices. Wode et al. demonstrated a prevalence of self-prayer in only 5.3% and spiritual healing in 2.6% of surveyed Swedish cancer patients [14]. Similar results were obtained by Egilsdatter-Kri-

stoffersen et al. [15]. However, the study conducted by Abuelgasim et al. as well as by Lee et al, presented a prevalence of spiritual and self-help practices perceived as CAT above 95% of the surveyed population [12, 13].

The present study revealed a high prevalence of self-help practices (74.68%) with significant dominance of self-prayer (90.89%) in this category. Furthermore, visits to spiritual healers were accounted for over 64.36% of all visits to CAT providers in the present study population. The great degree of variability between those studies' results is similar to the variability in general CAT use reported. Those differences can be explained by dissimilarities of patient populations (inhabitants of different countries, representatives of different cultures) as well as by the methods used.

Another reason that needs to be considered for the greater interest in the spirituality of the study population is that they were patients in the advanced stage of cancer. Life-threatening illnesses and end-of-life are known as a factor increasing patients' interest in spirituality [16]. Moreover, in the literature regarding CAT, it has been reported that patients receiving palliative care were significantly more likely to use spiritual practices than those receiving curative anticancer treatment [10, 17, 18]. Second, the most widely applied CAT category in this study was herbal medicine and dietary supplements (62.65%). Similar results were obtained in other studies of cancer patients in Europe [8, 10, 14, 15, 19]. It was demonstrated that the main motivation to use CAT was to improve well-being (35.35%). The comparative assessment of the quality of life of CAT users and non-users was outside the scope of this study's objectives. However, the positive psychological effect of CAT should be noticed [8, 10, 16–18].

Most studies examining the subjective (assessed by patients) effectiveness of CAT report positive effects of such therapy [8, 11–13, 17]. Similar observations arise from the present study. As it was reported most patients who rated CAT therapy as helpful, a little helpful and very helpful (30.3%, 23.23% and 20.2%, respectively) and only 22 of 198 patients (11.11%) rated it as not helpful at all. It should be recalled that some studies suggest the effectiveness of CAT in supporting conventional therapy [1, 20, 21].

This study has several limitations. All patients participating in the study were members of one nation and a cultural group. However, this can be seen also as an advantage as it provides detailed and reliable information on the use of CAT among the Central European — Polish population of advanced cancer patients. All participants were treated at home; however, it was not possible to collect reliable information on a specific conventional anticancer therapy (chemotherapy, radiotherapy, hormonal therapy) done before, or planned after the time of survey completion. The study cohort has a high proportion of elderly patients, only 16.18% of the surveyed patients were less than 60 years old, which could have influenced results and should be considered when comparing with other cancer patient populations. The CAT screening tool was self-reported which creates the risk of errors when completing the questionnaire resulting from a misunderstanding of questions. Due to the nature of the CAT screening tool, it was impossible to link the use of individual therapies to the particular level of satisfaction or reasons for CAT use when more than one answer was given. Further studies may address these problems.

## Conclusions

The use of CAT among advanced cancer patients receiving palliative care at home is significant, with a higher prevalence of spiritual practices than reported in cancer patients. Reasons for implementation of alternative and complementary medicine are quite different among patients, but nearly always to prolong life and improve its quality. As some complementary and alternative therapies have proven influence on reducing treatment adverse effects, more studies are needed to determine their exact impact on cancer patients.

### *Declaration of conflict of interests*

The authors declare that there is no conflict of interest.

### *Funding*

None declared.

## Supplementary materials

**Table 3. Associations between complementary and alternative therapies and gender, age, education level, place of residence and marital status expressed in odds ratios (ORs) and 95% confidence intervals (CIs)**

	CAM (total)		Visits to CAM providers		Use of herbal medicine and dietary supplements		Self-help practices	
	OR	CI	OR	CI	OR	CI	OR	CI
<b>Gender</b>								
Women	2.11	1.07–4.16	1.53	0.91–2.56	1.33	0.79–2.25	1.08	0.6–1.93
Men	0.47	0.24–0.93	0.65	0.39–1.09	0.75	0.44–1.26	0.92	0.52–1.65
<b>Age</b>								
< 51	0.87	0.09–7.95	2.11	0.35–12.88	0.89	0.15–5.44	0.5	0.08–3.07
51–60	1.74	0.58–5.23	0.97	0.46–2.02	1.29	0.6–2.79	1.69	0.66–4.3
61–70	0.67	0.35–5.23	0.8	0.48–1.34	0.7	0.41–1.18	0.85	0.47–1.51
70–80	0.94	0.45–1.97	0.9	0.5–1.6	0.94	0.52–1.68	0.76	0.4–1.43
> 80	2.3	0.52–10.25	2.15	0.88–5.25	2.91	0.95–8.89	2.28	0.65–8
<b>Education level</b>								
Basic	1.22	0.4–3.74	0.85	0.37–1.96	0.95	0.41–2.19	1.15	1.23–2.41
Secondary	0.99	0.5–1.96	1.31	0.77–2.24	1.11	0.65–1.9	1.12	0.62–2.03
Tertiary	0.92	0.44–1.92	0.78	0.43–1.4	0.91	0.5–1.63	0.82	0.43–1.56
<b>Place of residence</b>								
Village	0.57	0.17–1.9	0.68	0.22–2.05	0.66	0.23–1.9	0.48	0.16–1.42
Town < 50 thousand	0.99	0.48–2.07	0.64	0.36–1.16	1.2	0.66–2.16	0.89	0.47–1.7
Town 50–200 thousand	1.2	0.61–2.35	1.76	1.02–3.03	1.04	0.6–1.79	1.45	0.8–2.62
Town > 200 thousand	0.87	0.09–7.95	0.34	0.04–3.09	0.39	0.06–2.38	0.5	0.08–3.07
<b>Marital status</b>								
Divorced/separated	1.09	0.3–3.95	1.65	0.61–4.46	0.45	0.17–1.18	0.87	0.3–2.55
Married	1.56	1.94–2.51	0.93	0.55–1.58	1.43	0.83–2.47	1.43	0.83–2.86
Single	0.33	0.14–0.75	0.7	0.29–1.7	0.23	0.1–0.52	0.41	0.19–0.9
Widowed	1.22	0.62–2.4	5.98	3.23–11.06	1.82	1.05–3.14	1.1	0.61–1.99

**Table 4. Self-described purpose of complementary and alternative medicine use**

	Improvement of wellbeing		Acute illness treatment		Long term illness treatment		To live longer		Conviction that everything has been done to beat the cancer	
Total CAM	35.35%	70	15.66%	31	24.24%	48	17.68%	35	7.07%	14
Visits to CAM providers	13.86%	14	10.89%	11	28.71%	29	32.67%	33	13.86%	14
Herbal medicine and dietary supplements	37.75%	57	10.60%	16	29.14%	44	16.56%	25	5.96%	9
Self-help practices	34.44%	62	16.11%	29	24.44%	44	17.78%	32	7.22%	13



**Table 5. Perceived degree of the helpfulness of complementary and alternative medicine use**

	Very helpful		Helpful		A little helpful		Possibly helpful		Not helpful	
Total CAM	20.20%	40	30.30%	60	23.23%	46	15.15%	30	11.11%	22
Visits to CAM providers	34.65%	35	33.66%	34	18.81%	19	7.92%	8	4.95%	5
Herbal medicine and dietary supplements	16.67%	33	31.79%	48	25.17%	38	13.25%	20	7.95%	12
Self-help practices	20.20%	40	30.00%	54	21.11%	38	15.56%	28	11.11%	20

**Questionnaire page 1/3**

Kwestionariusz I-CAM-Q – polskie tłumaczenie

Czy w ciągu ostatnich 12 miesięcy korzystał/a Pan/Pani z usług:			liczba wizyt	proszę wskazać przyczyny dla których skorzystano z usług						W jakim stopniu zastosowana terapia była pomocna?				
				celem leczenia choroby lub jej objawów, która trwa mniej niż miesiąc	celem leczenia przewlekłej choroby (>1miesiąca) lub jej objawów	poprawa jakości życia	przekonanie, że zrobiono wszystko, aby pokonać raka	dłuższe życie	inne- proszę sprecyzować	bardzo pomocna	pomocna	trochę pomocna	niezbyt pomocna	niepomocna
lekarz	tak	nie												
chiropraktyk	tak	nie												
homeopata	tak	nie												
akupunkturzysta	tak	nie												
zielarz	tak	nie												
bioenergoterapeuta	tak	nie												
inni: .....	tak	nie												
inni: .....	tak	nie												
inni: .....	tak	nie												

**Questionnaire page 2/3**

Do każdej z kategorii proszę podać do trzech produktów używanych w ciągu ostatnich 12 miesięcy:			Czy aktualnie korzysta pan/pani z tego produktu	liczba wizyt	proszę wskazać przyczyny dla których skorzystano z usług						W jakim stopniu zastosowana terapia była pomocna?				
					celem leczenia choroby lub jej objawów, która trwa mniej niż miesiąc	celem leczenia przewlekłej choroby (>1miesiąca) lub jej objawów	poprawa jakości życia	przekonanie, że zrobiono wszystko, aby pokonać raka	dłuższe życie	inne- proszę sprecyzować	bardzo pomocna	pomocna	umiarkowanie pomocna	niezbyt pomocna	niepomocna
LEKI ZIOŁOWE	tak	nie													
	tak	nie													
	tak	nie													
	tak	nie													
WITAMINY I SKŁADNIKI MINERALNE	tak	nie													
	tak	nie													
	tak	nie													
	tak	nie													
LEKI HOMEOPATYCZNE	tak	nie													
	tak	nie													
	tak	nie													
	tak	nie													
INNE	tak	nie													
	tak	nie													
	tak	nie													
	tak	nie													

Questionnaire page 3/3

Czy w ciągu ostatnich 12 miesięcy korzystała/a Pan/Pani z usług:			liczba wizyt	proszę wskazać przyczyny dla których skorzystano z usług						W jakim stopniu zastosowana terapia była pomocna?				
				celem leczenia choroby lub jej objawów, która trwa mniej niż miesiąc	celem leczenia przewlekłej choroby (>1miesiąca) lub jej objawów	poprawa jakości życia	przekonanie, że zrobiono wszystko, aby pokonać raka	dłuższe życie	inne- proszę sprecyzować	bardzo pomocna	pomocna	trochę pomocna	nieszyby pomocna	niepomocna
Medytacja	tak	nie												
Yoga	tak	nie												
techniki relaksacyjne	tak	nie												
Ćwiczenia oddechowe	tak	nie												
wizualizacja	tak	nie												
modlitwa	tak	nie												
Inny: .....	tak	nie												
Inny: .....	tak	nie												
Inny: .....	tak	nie												

References

- Mongioli J, Shi Z, Greenlee H. Complementary and alternative medicine use and absenteeism among individuals with chronic disease. *BMC Complement Altern Med.* 2016; 16: 248, doi: 10.1186/s12906-016-1195-9, indexed in Pubmed: 27460643.
- Kuo YH, Tsay SL, Chang CC, et al. Cancer Impact, Complementary/Alternative Medicine Beliefs, and Quality of Life in Cancer Patients. *J Altern Complement Med.* 2018; 24(3): 276–281, doi: 10.1089/acm.2016.0396, indexed in Pubmed: 28876080.
- Quandt SA, Verhoef MJ, Arcury TA, et al. Development of an international questionnaire to measure use of complementary and alternative medicine (I-CAM-Q). *J Altern Complement Med.* 2009; 15(4): 331–339, doi: 10.1089/acm.2008.0521, indexed in Pubmed: 19388855.
- Eardley S, Bishop FL, Cardini F, et al. A pilot feasibility study of a questionnaire to determine European Union-wide CAM use. *Forsch Komplementmed.* 2012; 19(6): 302–310, doi: 10.1159/000345839, indexed in Pubmed: 23343585.
- Re MLo, Schmidt S, Güthlin C. Translation and adaptation of an international questionnaire to measure usage of complementary and alternative medicine (I-CAM-G). *BMC Complement Altern Med.* 2012; 12: 259, doi: 10.1186/1472-6882-12-259, indexed in Pubmed: 23256756.
- Wemrell M, Merlo J, Mulinari S, et al. Two-Thirds of Survey Respondents in Southern Sweden Used Complementary or Alternative Medicine in 2015. *Complement Med Res.* 2017; 24(5): 302–309, doi: 10.1159/000464442, indexed in Pubmed: 28535538.
- Johnson C, Aaronson N, Blazeby JM; Guidelines for Developing Questionnaire Modules, on behalf of the EORTC Quality of Life Group: EORTC Quality of Life Group Translation Procedure. EORTC, 4th edition; April 2011. [www.eortc.org](http://www.eortc.org) (October 10, 2018).
- Bozza C, Gerratana L, Basile D, et al. Use and perception of complementary and alternative medicine among cancer patients: the CAMEO-PRO study : Complementary and alternative medicine in oncology. *J Cancer Res Clin Oncol.* 2018; 144(10): 2029–2047, doi: 10.1007/s00432-018-2709-2, indexed in Pubmed: 30043280.
- Abdallah R, Xiong Y, Lancaster JM, et al. Complementary and Alternative Medicine Use in Women With Gynecologic Malignancy Presenting for Care at a Comprehensive Cancer Center. *Int J Gynecol Cancer.* 2015; 25(9): 1724–1730, doi: 10.1097/IGC.0000000000000549, indexed in Pubmed: 26397156.
- Edwards GV, Aherne NJ, Horsley PJ, et al. Prevalence of complementary and alternative therapy use by cancer patients undergoing radiation therapy. *Asia Pac J Clin Oncol.* 2014; 10(4): 346–353, doi: 10.1111/ajco.12203, indexed in Pubmed: 24837068.
- Bosacki C, Vallard A, Gras M, et al. Complementary and alternative medicines in cancer patients. *Bull Cancer.* 2019; 106(5): 479–491, doi: 10.1016/j.bulcan.2019.02.011, indexed in Pubmed: 31023481.
- Abuelgasim KA, Alsharhan Y, Alenzi T, et al. The use of complementary and alternative medicine by patients with cancer: a cross-sectional survey in Saudi Arabia. *BMC Complement Altern Med.* 2018; 18(1): 88, doi: 10.1186/s12906-018-2150-8, indexed in Pubmed: 29530034.
- Lee JuAh, Sasaki Y, Arai I, et al. An assessment of the use of complementary and alternative medicine by Korean people using an adapted version of the standardized international questionnaire (I-CAM-QK): a cross-sectional study of an internet survey. *BMC Complement Altern Med.* 2018; 18(1): 238, doi: 10.1186/s12906-018-2294-6, indexed in Pubmed: 30103722.
- Kristoffersen AE, Stub T, Broderstad AR, et al. Use of traditional and complementary medicine among Norwegian cancer



- patients in the seventh survey of the Tromsø study. *BMC Complement Altern Med.* 2019; 19(1): 341, doi: [10.1186/s12906-019-2762-7](https://doi.org/10.1186/s12906-019-2762-7), indexed in Pubmed: [31783842](https://pubmed.ncbi.nlm.nih.gov/31783842/).
15. Wode K, Henriksson R, Sharp L, et al. Cancer patients' use of complementary and alternative medicine in Sweden: a cross-sectional study. *BMC Complement Altern Med.* 2019; 19(1): 62, doi: [10.1186/s12906-019-2452-5](https://doi.org/10.1186/s12906-019-2452-5), indexed in Pubmed: [30866916](https://pubmed.ncbi.nlm.nih.gov/30866916/).
  16. Mesquita AC, Chaves Éd, Barros GA. Spiritual needs of patients with cancer in palliative care: an integrative review. *Curr Opin Support Palliat Care.* 2017; 11(4): 334–340, doi: [10.1097/SPC.0000000000000308](https://doi.org/10.1097/SPC.0000000000000308), indexed in Pubmed: [28922295](https://pubmed.ncbi.nlm.nih.gov/28922295/).
  17. Van Hyfte GJ, Kozak LE, Lepore M. A survey of the use of complementary and alternative medicine in Illinois hospice and palliative care organizations. *Am J Hosp Palliat Care.* 2014; 31(5): 553–561, doi: [10.1177/1049909113500378](https://doi.org/10.1177/1049909113500378), indexed in Pubmed: [23943631](https://pubmed.ncbi.nlm.nih.gov/23943631/).
  18. Zeng YS, Wang C, Ward KE, et al. Complementary and Alternative Medicine in Hospice and Palliative Care: A Systematic Review. *J Pain Symptom Manage.* 2018; 56(5): 781–794.e4, doi: [10.1016/j.jpainsymman.2018.07.016](https://doi.org/10.1016/j.jpainsymman.2018.07.016), indexed in Pubmed: [30076965](https://pubmed.ncbi.nlm.nih.gov/30076965/).
  19. Abdullah N, Borhanuddin B, Patah AE, et al. Utilization of Complementary and Alternative Medicine in Multi-ethnic Population: The Malaysian Cohort Study. *J Evid Based Integr Med.* 2018; 23: 2515690X18765945, doi: [10.1177/2515690X18765945](https://doi.org/10.1177/2515690X18765945), indexed in Pubmed: [29651870](https://pubmed.ncbi.nlm.nih.gov/29651870/).
  20. Ganguly S, Chandra A, Chatterjee IB. Pathobiology of cigarette smoke-induced invasive cancer of the renal pelvis and its prevention by vitamin C. *Toxicol Rep.* 2018; 5: 1002–1010, doi: [10.1016/j.toxrep.2018.10.005](https://doi.org/10.1016/j.toxrep.2018.10.005), indexed in Pubmed: [30338226](https://pubmed.ncbi.nlm.nih.gov/30338226/).
  21. Ravindranathan P, Pasham D, Balaji U, et al. A combination of curcumin and oligomeric proanthocyanidins offer superior anti-tumorigenic properties in colorectal cancer. *Sci Rep.* 2018; 8(1): 13869, doi: [10.1038/s41598-018-32267-8](https://doi.org/10.1038/s41598-018-32267-8), indexed in Pubmed: [30218018](https://pubmed.ncbi.nlm.nih.gov/30218018/).