

Prevalence of Complementary Medicine Use in Patients With Cancer: A Turkish Comprehensive Cancer Center Experience

abstract

Purpose Complementary and alternative medicine (CAM) has been popular among patients with cancer for several decades. The objectives of this study were to evaluate the prevalence of CAM use and to identify the factors affecting CAM use in a large patient cohort seen at a comprehensive cancer center in Turkey.

Patients and Methods An investigator-designed survey was completed by volunteer patients who visited the outpatient clinic in the medical oncology department. CAM use encompassed pharmacologic agents including vitamins, dietary supplements, and herbal products or nonpharmacologic methods like prayer, meditation, hypnosis, massage, or acupuncture.

Results Of 1,499 patients who answered the survey, 1,433 (96%) used nonpharmacologic CAM and 60 (4%) used pharmacologic CAM (pCAM). The most frequent types of CAM used were prayer ($n = 1,433$) followed by herbal products ($n = 42$). pCAM use was not significantly associated with age ($P = .63$), sex ($P = .15$), diagnosis ($P = .15$), or income level ($P = .09$). However, it was significantly associated with the level of education ($P = .0067$) and employment status ($P < .001$). Patients with higher education levels used more pCAM products ($P = .025$). Among 60 pCAM users, six patients (10%) used pCAM for more than 2 years and 22 (36%) did not consult their physicians about their pCAM use. Only nine patients (15%) reported unpleasant adverse effects related to pCAM.

Conclusion Although CAM use was high among our patients, prevalence of pCAM use was lower than expected. Patients with higher education levels tended to use more pCAM.

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INTRODUCTION

According to the US National Center for Complementary and Integrative Health, complementary and alternative medicine (CAM) is defined as a group of diverse medical and health care systems, practices, and products that are not considered to be part of conventional (Western) medicine.¹ It is known that CAM is frequently used by patients with cancer around the world. A recent meta-analysis suggested an increase in CAM use in cancer care from an estimated 25% in the 1970s and 1980s to more than 32% in the 1990s and to 49% after 2000.² Several factors, such as disease status, sociodemographic factors, beliefs, and cultural norms, may influence CAM use. In the literature, there are several studies providing information about the prevalence and patterns of CAM use among patients with cancer for different population groups. However, they did not use the same

methodology; thus, it is difficult to estimate the effect of national, regional, and cultural factors on the use of CAM at the global level.

In this study, we used a questionnaire previously designed by one of the investigators. The first study using this survey was performed among patients who applied to the phase I clinic at MD Anderson Cancer Center. In our study, the same methodology was used to evaluate the prevalence of CAM use and the factors affecting it in a large patient population seen at a comprehensive cancer center in Turkey.³

PATIENTS AND METHODS

Study Design and Methods

An investigator-designed survey³ was completed by volunteer patients who consequently applied to the medical oncology department for treatment in 2014. Patients were asked if they wanted to

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complete the survey by the study coordinator, who distributed the questionnaire and collected the data. The study was approved by the Hacettepe University School of Medicine Ethics Board (GO 13/541).

Hacettepe University Oncology Hospital is part of Hacettepe University Hospitals, located in Ankara, the capital of Turkey. It serves as one of the biggest reference centers in the country and operates in conjunction with one of the first cancer centers in Turkey: Hacettepe Cancer Institute. Every year, approximately 80,000 patients are evaluated through medical oncology, radiation oncology, pediatric oncology, basic oncology, preventive oncology, bone marrow transplantation unit, intensive care unit, palliative care unit, apheresis unit, outpatient treatment unit, radiology, nuclear medicine, nutrition and diet, physiotherapy, oncology pharmacy, and relevant specialized laboratory services of the center. Surgical oncology services are provided on the same campus by either adult or pediatric surgery units.

Definition of CAM

As in the previous study, CAM was defined as pharmacologic agents including vitamins, dietary supplements, and herbal products or nonpharmacologic methods like prayer, meditation, hypnosis, massage, or acupuncture.³ However, recent literature does not include prayer as a CAM method. Thus, univariable descriptive statistics included prayer, but the analytic statistics did not.

Questionnaire

The survey was designed by one of the investigators (A.N.) and previously completed by volunteer patients at the phase I clinic of MD Anderson Cancer Center. The results of this study were published in 2011.³ We used a Turkish version of the same questionnaire.

Statistical Analysis

Descriptive statistics were used to summarize the data. The prevalence of CAM use was estimated with 95% CIs. Age, sex, race, employment status, income, and education were constructed as categorical variables and tabulated. The χ^2 test was used to examine the association of pharmacologic CAM (pCAM) use with each of the categorical variables. A logistic regression model was implemented to estimate the effect of significant variables identified from the χ^2 test on the probability of pCAM use. A *P* value < .05 was considered to be significant. Statistical analyses were carried out

using SAS software (version 9.1; SAS Institute, Cary, NC).

RESULTS

Patient Characteristics

Between September and December 2014, a total of 1,499 patients completed the survey. Of these patients, 1,072 (71%) were female and 1,081 (72%) were age \leq 60 years. White patients comprised 94% of the study population. Patients had been treated with chemotherapy (90%), surgery (70%), or radiotherapy (53%) as conventional therapy. A majority of patients (98%) had not participated in a similar study before. Fourteen patients were currently in a phase I trial. All patients were in active treatment at the time of the study.

Patterns of CAM Use

Among 1,499 patients, 1,435 (96%) reported using some form of CAM. Sixty patients (4%) reported using pCAM, and 1,433 (95%) reported using nonpharmacologic CAM (non-pCAM). The most commonly used types of CAM were prayer ($n = 1,433$; 99%) and herbal preparations ($n = 42$; 2.9%). Non-pCAM users were dominant and mainly composed of the 1,433 patients who chose prayer. The other non-pCAM methods used were exercise ($n = 3$), meditation ($n = 1$), and chiropractic care or massage ($n = 1$). So as not to dilute the results and to avoid controversies in the definition of prayer as CAM, we specifically analyzed the pCAM group. The duration of pCAM use was reported by 50 patients, and 26% of them used pCAM \geq 2 years. Only two patients (4%) used pCAM more than 5 years. Twenty-two patients (42%) of 52 responders did not tell their physician about their pCAM use. When asked about the perceived benefits of pCAM, of 45 responders, 10 (22%) responded "no benefit," 14 (31%) responded "maybe," eight (18%) responded "yes" (ie, there were benefits), and 13 (29%) checked "I don't know." Of 46 patients who responded to the question about the unpleasant adverse effects of pCAM, 29 (63%) reported no adverse effects, four (9%) reported definite adverse effects, five (10%) checked "maybe," and eight (18%) checked "I don't know."

Patterns of pCAM Use

Characteristics of pCAM users are listed in Table 1. pCAM use was not significantly associated with age ($P = .63$), sex ($P = .15$), diagnosis ($P = .15$), year of diagnosis ($P = .13$) or income level ($P = .09$). However, it was significantly associated with the

Table 1. Characteristics of pCAM Users

| Group | No. of Patients Who Answered Survey (N = 1,499) | No. (%) of Patients Using pCAM (n = 60) | P |
|----------------------|---|---|--------|
| Age, years | | | .63 |
| < 31 | 57 | 2 (3.5) | |
| 31-40 | 209 | 12 (5.7) | |
| 41-50 | 394 | 11 (2.8) | |
| 51-60 | 421 | 17 (4.0) | |
| 61-65 | 155 | 6 (3.9) | |
| > 65 | 257 | 12 (4.7) | |
| Sex | | | .11 |
| Female | 1,072 | 37 (3.5) | |
| Male | 472 | 23 (5.4) | |
| Diagnosis | | | .15 |
| Breast cancer | 847 | 26 (3.1) | |
| Colorectal cancer | 212 | 9 (4.2) | |
| Lung cancer | 154 | 9 (5.8) | |
| Other | 282 | 16 (5.7) | |
| Year of diagnosis | | | .13 |
| < 2001 | 11 | 1 (9.1) | |
| 2001-2005 | 32 | 3 (9.4) | |
| 2006-2009 | 89 | 7 (7.9) | |
| 2010-2013 | 1,311 | 47 (3.6) | |
| 2014 | 48 | 2 (4.2) | |
| Income, \$ per year | | | .09 |
| < 60,000 | 1,282 | 46 (3.6) | |
| 60,001-120,000 | 191 | 12 (6.3) | |
| > 120,000 | 21 | 2 (9.5) | |
| Education | | | .0067 |
| None | 52 | 2 (3.8) | |
| < High school | 224 | 13 (5.8) | |
| Some high school | 161 | 11 (6.8) | |
| High school | 555 | 14 (2.5) | |
| College/some collage | 445 | 13 (2.9) | |
| Professional degree | 58 | 6 (10.3) | |
| Employment | | | < .001 |
| Full time | 303 | 10 (3.3) | |
| Part time | 5 | 1 (20) | |
| On disability | 62 | 9 (14.5) | |
| Self-employed | 43 | 1 (2.3) | |
| Retired | 413 | 20 (4.8) | |
| Unemployed | 672 | 19 (2.8) | |
| Prayer | | | .48 |
| No | 65 | 1 (1.5) | |
| Yes | 1,433 | 59 (4.1) | |

Abbreviation: pCAM, pharmacologic complementary and alternative medicine.

level of education ($P = .0067$) and employment status ($P < .001$). Patients with higher education levels used more pCAM products ($P = .025$). Table 2 summarizes the features of pCAM use.

DISCUSSION

Depending on the definition of CAM and the number of patients included, the prevalence of CAM use is estimated to be up to 90% among patients with cancer.³ We found that 96% of patients used non-pCAM and 4% of patients used pCAM in a single comprehensive cancer center.

In this study, we used a survey that was previously administered by Naing et al³ among 309 patients in a phase I clinical trials program. We found that there were differences in the patterns of CAM use between the studies (Table 3). Naing et al showed that 52% of patients used one or more CAM. Of these patients, 77% used pCAM and 71% used non-pCAM. The types of CAM most frequently used were vitamins (70%), prayer (57%), and herbal products (26%). Our data revealed that prayer was the most common type of CAM (96%). Our patients used less pCAM (4%), with the most frequently used pCAM being herbal products (2.9%). Although the methodology was the same, the study populations were different at the two centers. The previous study was performed among patients with cancer in phase I clinical trials. In our study, the patient group was heterogenous, with only 14 patients in a phase I clinical trial.

In several studies, prayer has been grouped with spiritual healing and other relaxation techniques, which are forms of mind-body medicine.⁴ Tippens et al⁴ revealed that defining prayer as a CAM potentially inflates the statistics of CAM use. The term prayer may be insufficient to distinguish between the various forms of spiritual healing used by practitioners and the common understanding of the word as a religious term. It was shown that 62% of 31,044 adults in the United States used some form of CAM. However, when prayer was excluded from the analysis, only 36% of adults were found to use CAM therapies.⁵

Many people, especially those with advanced forms of disease, may pray for their health. Mao et al⁵ reported the prevalence of CAM and prayer for health (PFH) among cancer survivors and compared the rates with those in the US general population. Among 31,044 participants, 1,904 had a prior diagnosis of cancer, of whom 40% reported CAM and 62% reported PFH use during

Table 2. Features of pCAM Use (n = 60)

| Feature | No. (%) of Patients |
|--------------------------------|---------------------|
| Duration | |
| ≤ 6 months | 25 (41) |
| 1 year | 12 (20) |
| 2 years | 7 (12) |
| > 2 years | 6 (10) |
| Unknown | 10 (17) |
| Adverse effects | |
| No | 29 (48) |
| Yes | 4 (7) |
| Maybe | 5 (8) |
| Unknown | 22 (37) |
| Disclosure to physician | |
| Yes | 22 (37) |
| No | 22 (37) |
| To some extent | 8 (13) |
| Unknown | 8 (13) |

Abbreviation: pCAM, pharmacologic complementary and alternative medicine.

the year before the survey. Controlling for socioeconomic factors, it was found that cancer survivors significantly used more CAM and PFH than the general population in the United States.

Cultural and religious beliefs may also affect the prevalence and patterns of CAM use. A Greek study among parents of 184 children with cancer revealed that prayer and blessings for healing were the most popular complementary intervention (78%).⁶ Chui et al⁷ reported the prevalence of PFH and CAM use among Malaysian patients with breast cancer during chemotherapy. Of 546 patients who participated in the study, 70.7% reported using some form of CAM. When PFH was excluded, the use of CAM was reported to be 66.1%. The most common CAM pattern was natural products (82.8%). CAM use was associated with higher education level and household income, advanced cancer, and lower chemotherapy schedule compliance. In our cohort, 96% of patients listed prayer as a CAM method, which is higher than previously reported (57%).³

In the United States, CAM use is reported to be higher among women and those with higher levels of education and higher incomes.⁸⁻¹⁰ Naing et al³ found that CAM was used more common by women ($P < .01$).³ We found an association of pCAM use with education level and employment status. Patients who have a professional degree used more pCAM. It is likely that these patients

have easy access to sources about CAM, and they want to take an active part in their treatment.

Recently, it was shown that nonvitamin, nonmineral dietary supplements were the most commonly used complementary health method in United States. The rates were 18.9% in 2002 and 17.7% in both 2007 and 2012.¹⁰ In our study, pCAM use was less frequent than previously reported. Although the number of patients completing our survey was high, this was a single-center study, and it does not reflect the whole population. In our study, patients might not have fully disclosed their pCAM use.

Although the level of education was high among our pCAM users, it is surprising that 42% of those patients did not tell their physician about their use. This might be related to the lack of time to discuss CAM with the health team and the absence of an integrative medicine program at our center.

CAM is usually perceived as a natural and nontoxic method; thus, it is not discussed with the physician

Table 3. Comparison of Characteristics of Patients Completing Survey From Both Centers

| Characteristic | No. (%) | |
|----------------------------------|-----------------------|-----------------|
| | Our Study (N = 1,499) | MDACC (n = 309) |
| Age, years | | |
| ≤ 60 | 1,081 (72) | 173 (56) |
| > 60 | 418 (28) | 136 (44) |
| Sex | | |
| Male | 427 (28) | 142 (46) |
| Female | 1,071 (72) | 167 (54) |
| Race | | |
| White | 1,411 (94) | 261 (84) |
| Nonwhite | 88 (6) | 48 (16) |
| CAM use | | |
| User | 1,435 (96) | 162 (52) |
| Nonuser | 64 (4) | 147 (48) |
| pCAM | | |
| Non-pCAM | 1,375 (92) | 115 (37) |
| pCAM and non-pCAM | 59 (4) | 77 (25) |
| Prominent patterns of CAM | | |
| Prayer | 1,433 (99) | 92 (57) |
| Herbal | 42 (2.9) | 42 (26) |
| Vitamin | 11 (0.07) | 113 (70) |

Abbreviations: CAM, complementary and alternative medicine; MDACC, MD Anderson Cancer Center; non-pCAM, nonpharmacologic complementary and alternative medicine; pCAM, pharmacologic complementary and alternative medicine.

if the patient is not asked about it. However, disclosure of pCAM use is important, especially in the setting of a breakout of unexpected toxicities in patients receiving chemotherapy. Herbal hepatotoxicities, some even leading to acute liver failure, have been reported in the literature.¹¹⁻¹³ Physicians should be aware of the use of CAM and ask their patients in routine assessment.

In the literature, there are several studies regarding CAM use in various population groups, with more or less similar results. However, it is usually difficult to interpret the results globally because of the presence of many demographic, regional, and social and cultural differences and the lack of a standard methodology to evaluate them. In this study, we used a common survey that was previously used among patients with cancer at the MD Anderson Cancer Center phase I clinic. The survey has questions evaluating the CAM use patterns together with the demographic and cultural

characteristics of the study population. When the same methodology was used, we found differences in the prevalence and patterns of CAM use. However, the difference in patient groups should be taken into consideration to avoid rigid conclusions. It is important to develop common surveys and use them in future trials. This will help in understanding and evaluating CAM use globally.

In conclusion, the prevalence of CAM use was high among patients at a single comprehensive cancer center in Turkey. Our patients reported using less pCAM than expected. Patients' education level was found to be significantly associated with pCAM use in our center. History of CAM use should be a part of patient evaluation, and patients should be encouraged to disclose it to their health care team.

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REFERENCES

1. National Center for Complementary and Integrative Health: Complementary, Alternative, or Integrative Health: What's in a Name? https://nccih.nih.gov/sites/nccam.nih.gov/files/Whats_In_A_Name_06-16-2016.pdf
2. Horneber M, Bueschel G, Dennert G, et al: How many cancer patients use complementary and alternative medicine: A systematic review and metaanalysis. *Integr Cancer Ther* 11:187-203, 2012
3. Naing A, Stephen SK, Frenkel M, et al: Prevalence of complementary medicine use in a phase I clinical trials program: The MD Anderson Cancer Center experience. *Cancer* 117:5142-5150, 2011
4. Tippens K, Marsman K, Zwickey H: Is prayer CAM? *J Altern Complement Med* 15:435-438, 2009

5. Mao JJ, Farrar JT, Xie SX, et al: Use of complementary and alternative medicine and prayer among a national sample of cancer survivors compared to other populations without cancer. *Complement Ther Med* 15:21-29, 2007
6. Pourtsidis A, Doganis D, Baka M, et al: Prayer and blessings focused for healing is the most popular complementary intervention in a paediatric oncology unit in Greece. *J BUON* 20:602-607, 2015
7. Chui PL, Abdullah KL, Wong LP, et al: Prayer-for-health and complementary alternative medicine use among Malaysian breast cancer patients during chemotherapy. *BMC Complement Altern Med* 14:425, 2014
8. Barnes PM, Powell-Griner E, McFann K, et al: Complementary and alternative medicine use among adults: United States, 2002. *Adv Data* 343:1-19, 2004
9. Prevalence, cost, and patterns of CAM use, in Institute of Medicine (US) Committee on the Use of Complementary and Alternative Medicine by the American Public: *Complementary and Alternative Medicine in the United States*. Washington, DC, National Academies Press, 2005
10. Clarke TC, Black LI, Stussman BJ, et al: Trends in the use of complementary health approaches among adults: United States, 2002-2012. *Natl Health Stat Rep* 10:1-16, 2015
11. Stickel F, Patsenker E, Schuppan D: Herbal hepatotoxicity. *J Hepatol* 43:901-910, 2005
12. Chitturi S, Farrell GC: Herbal hepatotoxicity: An expanding but poorly defined problem. *J Gastroenterol Hepatol* 15: 1093-1099, 2000
13. De Smet PA: Herbal remedies. *N Engl J Med* 347:2046-2056, 2002