

Complementary and Alternative Medicine Use and Its Association with Emotional Status and Quality of Life in Patients with a Solid Tumor: A Cross-Sectional Study

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Abstract

Objectives: Complementary and alternative medicine (CAM) has been used widely in various populations for various purposes, including emotional support and improvement of quality of life (QOL). However, CAM use and purposes for using CAM are less clear among Korean patients with a solid tumor. The purpose of this study was to determine the prevalence and type of CAM use, and the association between CAM use and anxiety, depression, and QOL in patients with a solid tumor.

Design: A cross-sectional survey.

Setting: A cancer center in Korea.

Subjects: Two hundred and sixteen patients diagnosed with a solid tumor.

Outcome measures: Standard questionnaires on CAM use, Hospital Anxiety and Depression Scale, and European Organization for Research and Treatment of Cancer QLQ-C30.

Results: One hundred thirty one patients (60.6%) reported using CAM. CAM users, compared with non-CAM users, were significantly younger (57.8 vs. 60.9 years, $p=0.05$), had higher level of education ($p=0.008$), had higher income ($p=0.008$), were less likely to seek physician consultation on CAM use ($p=0.002$), and had a more advanced stage of tumor ($p=0.003$) with more distant metastasis ($p=0.001$). The most commonly used CAM was herbal medicine ($n=89$, 67.9%). CAM users had significantly lower anxiety ($t=5.21$, $p<0.001$) and depression ($t=4.90$, $p<0.001$) than non-CAM users. When the effects of CAM use were tested on anxiety, depression, and QOL, controlling for covariates, CAM use was significantly associated with 8.7% and 8.8% of variance in decreasing anxiety and depression, but there was no unique association of CAM use with variance in QOL.

Conclusions: CAM use is prevalent and younger age, higher education levels, higher income, less physician consultation, and higher cancer stage are significant correlates to CAM use. Controlling for covariates (e.g., gender, BMI), CAM use is significantly associated with lower anxiety and depression compared with those of non-CAM users.

Keywords: complementary and alternative medicine, cancer, herbal medicine, anxiety, depression, quality of life

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Introduction

CANCER PATIENTS FACE significant physiological, psychological, and socioeconomic challenges. Emotional distress, such as anxiety and depression, are common during cancer diagnosis and treatment, which can negatively affect quality of life (QOL).¹⁻⁴ Although overall survival rates of cancer patients are continuously improving with advances in cancer treatments,⁵⁻⁷ how cancer patients manage their emotional distress and sustain QOL is less clear.

Complementary and alternative medicine (CAM) is commonly used in general and sick populations for various reasons and purposes.⁷⁻¹³ The National Center for Complementary and Integrative Health (NCCIH) defines CAM as a group of diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine.¹⁴ Among several different categories of CAM, nonbiologically based therapies include acupuncture, hydrotherapy, massage, and music therapy, whereas biologically based therapies include herbal medicine, vitamins, and dietary supplements.

In cancer populations, up to 79% of cancer patients are known to use CAM.^{7,15-21} However, prevalence and type of CAM use in cancer patients may differ among different cultures and regions. For example, overall CAM use in European studies has been relatively lower than CAM use in Asian studies.^{17,18,20,21} Similarly, the use of herbal medicine has been high among Asian cancer patients,²²⁻²⁴ whereas western cancer patients primarily have used nonherbal medicine, such as vitamins and minerals.²⁵⁻²⁸ High use of herbal medicine among Asians typically is based on a belief that traditional Chinese medicine helps to improve cancer prognosis.¹⁷ In addition, sociodemographic factors, such as age, sex, education level, and income, in addition to clinical factors of tumor stage, disease duration, and family history of tumor, may affect the type and prevalence of CAM use.^{7,16,29,30}

Reasons and purposes for using CAM include longer survival, prevention of cancer recurrence, and improvement of immune function.³¹ Other reasons include alleviation of side-effects from conventional treatment, meeting unmet physical needs, managing emotional distress, and improving QOL.^{7,18,19,32,33} However, the actual efficacy of CAM use in meeting such purposes has not been adequately assessed. Similarly, data on the association between CAM use and emotional distress and QOL are limited. Therefore, the purposes of this study were to assess the prevalence and types of CAM use, and the association between CAM use and anxiety, depression, and QOL in Korean adult patients with a solid tumor.

Materials and Methods

Design

This was a cross-sectional study with one-time data collection.

Participants

Two hundred sixteen patients participated in the study. Inclusion criteria of the participants were as follows: (1) age 18 years or older, (2) confirmed diagnosis of having a solid tumor (3) no known psychiatric illness (e.g., schizophrenia), (4) no evidence of cognitive impairment, and (5) ability to

speak and understand Korean. The types of solid tumors included were breast, lung, genitourinary, gynecologic, gastrointestinal, and head and neck cancer, but patients with nonmetastatic papillary thyroid cancer or endoscopically resected early gastric or colon cancer were excluded because patients with these tumors have a relatively high QOL compared to patients with other solid tumors due to minimal major organ dysfunction and a survival rate of nearly 100% with treatments.³⁴ Patients were recruited from outpatient clinics during their clinic visits for postoperative follow-up, cancer treatment (chemotherapy and/or radiotherapy), or postcancer treatment checkup. Of 233 patients approached, 216 (92.7%) consented to participate in the study. The sample size was estimated based on a low correlation coefficient between CAM use and anxiety (primary interest), $r=0.20$, power of 80%, and significance level of alpha set at 0.05. The study protocol was approved by the Institutional Review Board of the university-affiliated hospital in South Korea. All patients provided a written informed consent to participate in the study before data collection.

Data were collected using standardized questionnaires in a quiet consultation room in the clinic, and questionnaires were read to the participant for responses in a face-to-face interview. At the completion of data collection, participants received a small gift package for their time.

Instrument

Anxiety and depression were measured using the Hospital Anxiety and Depression Scale (HADS). HADS contains 14 items that are to be rated on a Likert scale of 0 to 3, 0 = not at all to 3 = definitely/most of the time.³⁵ HADS has two subscales of anxiety and depression, each including seven items with a potential range of score from 0 to 21. Higher scores indicate higher levels of anxiety and depression. Cronbach's α in this study were 0.89 and 0.87 for anxiety and depression.

QOL was evaluated using the Korean version of European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30, version 3, which is approved by the EORTC Data Center. The questionnaire includes both multi-item scales and single-item measures. The 30-item questionnaire is designed to assess global health status, five functional statuses (physical, role, emotional, cognitive, and social function), and nine symptoms (fatigue, nausea and vomiting, pain, dyspnea, loss of appetite, constipation, diarrhea, and financial difficulties).³⁶ The global health status is calculated from two items on overall health last week and overall HRQoL last week on a 7-point scale (1 = very poor to 7 = excellent). The other 28 items for functional and symptom status are rated on a 4-point scale (1 = not at all to 4 = very much). All scale scores were linearly transformed from 0 to 100 according to the instrument instructions. High scores of global health and functional status represent high levels of health and function, whereas high scores of symptom scales indicate high degrees of symptoms. Cronbach's α for the EORTC QLQ-C30 was 0.91 in this study.

CAM Use was assessed using a 53-item questionnaire. Because the previous 38-item CAM questionnaire³⁷ was short of assessing common CAM used by many patients, 15 items were added to include biologically based therapies (e.g., mineral supplements, antioxidant supplements) suggested by the Korean Ministry of Food and Drug Safety

(MFDS). The revised 53-item questionnaire included both nonbiologically based therapies (e.g., acupuncture, homeopathy, prayer, massage) and biologically based therapies (e.g., herbal medicine, vitamins supplements). To each item, participants responded by answering yes or no for use of the item, and one open question was used to gain any additional CAM that was not included in the questionnaire.

Demographic and clinical information was collected from a background questionnaire. Items included age, body mass index (BMI), residency, marital status, religion, educational level, and monthly household income, comorbidity, physician consultation on CAM use, and satisfaction with conventional treatment. Information regarding cancer (e.g., cancer type and stage, time duration since cancer diagnosis, distant metastasis, and treatment information) was obtained from the medical records.

Data analysis

Descriptive statistics were calculated to describe the characteristics of participants and the prevalence and types of CAM used. Group differences between CAM users and non-CAM users were tested using chi-squared test for categorical data and independent *t* test for continuous data. Spearman's rho and Pearson correlation coefficients were used to assess the association between demographic and clinical information and anxiety, depression, and QOL. Hierarchical multiple linear regression analysis was used to test the association between CAM use and anxiety, depression, and QOL. In step 1 of the hierarchical linear regression analyses, significant covariates (gender, BMI, time duration since cancer diagnosis, and cancer treatment for anxiety; gender and time duration since cancer diagnosis

for depression; and time duration since cancer diagnosis for QOL) were entered, followed by entering the use of CAM in step 2. Standardized estimate (β), *F*, Total R^2 , Adjusted R^2 , and R^2 -change (ΔR^2) for each step were provided in the regression models. To check the multicollinearity concern, the variance inflation factor was estimated and found to be less than 10, indicating no concern with multicollinearity among independent variables. All statistical analyses were performed using SPSS 22.0 version (SPSS, Inc., Armonk, NY) and $p < 0.05$ were considered significant.

Results

Characteristics of participants and differences between CAM users and non-CAM users

The mean age of all participants ($N = 216$) was 59.0 ± 11.6 years and the mean BMI was 22.3 ± 2.9 kg/m². Females comprised 69.4% of the participants, and nearly 40% of the participants had less than a high school education. The majority (85.7%) were married, and 64.4% did not seek physician consultation on CAM use. CAM users were significantly younger (57.8 vs. 60.9 years old, $p = 0.05$), had higher level of education ($p = 0.008$), had monthly higher income ($p = 0.008$), and less likely to seek physician consultation on CAM use than non-CAM users ($p = 0.002$) (Table 1).

For clinical characteristics, common cancer types included gynecologic (31.0%), gastrointestinal (24.1%), and breast cancer (16.7%), and the majority of the patients (70.4%) had been diagnosed with cancer more than 12 months prior. Chemotherapy was the most frequent type of cancer treatment (41.2%) and 28.2% of patients had completed active cancer

TABLE 1. THE DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS ($N = 216$)

Characteristics	Categories	Total	CAM user	CAM nonuser	χ^2/t	p
		($N = 216$)	($n = 131$)	($n = 85$)		
		Mean \pm SD	Mean \pm SD	Mean \pm SD		
Age (years)		59.0 ± 11.6	57.8 ± 11.3	60.9 ± 11.8	1.99	0.05
BMI (kg/m ²)		22.3 ± 2.9	22.3 ± 2.6	22.4 ± 3.4	-0.12	0.90
		N (%)	N (%)	N (%)		
Gender	Male	66 (30.6)	38 (29.0)	28 (32.9)	0.38	0.54
	Female	150 (69.4)	93 (71.0)	57 (67.1)		
Age (years) ^a	<65	151 (69.9)	102 (77.9)	49 (57.6)	10.01	0.002
	≥ 65	65 (30.1)	29 (22.1)	36 (42.4)		
Education level	Elementary school	50 (23.1)	23 (17.6)	27 (31.8)	11.74	0.008
	Middle school	36 (16.7)	18 (13.7)	18 (21.2)		
	High school	94 (43.5)	62 (47.3)	32 (37.6)		
	College/University	36 (16.7)	28 (21.4)	8 (9.4)		
Marital status	Single	7 (3.2)	3 (2.3)	4 (4.7)	1.53	0.47
	Married	185 (85.7)	115 (87.8)	70 (82.4)		
	Missing	24 (11.1)	13 (9.9)	11 (12.9)		
Income/mo (\$) ^b	<3,000	142 (65.7)	77 (58.8)	65 (76.5)	7.16	0.008
	$\geq 3,000$	74 (34.3)	54 (41.2)	20 (23.5)		
Physician consultation	Yes	77 (35.6)	36 (27.5)	41 (48.2)	9.68	0.002
	No	139 (64.4)	95 (72.5)	44 (51.8)		

Italic bold values are significant.

^aThe elderly age criteria (more than 65 years) based on the Korean Geriatric Medical Association.

^bThe average monthly wage of workers was \$3000 in 2015 in Korea (Ministry of Employment & Labor in Korea).

BMI, body mass index; CAM, complementary and alternative medicine; SD, standard deviation.

TABLE 2. THE CLINICAL CHARACTERISTICS OF PARTICIPANTS (N=216)

Characteristics	Categories	Total (N=216)	CAM user (n=131)	CAM nonuser (n=85)	χ^2/t	p
Cancer type	Head and neck	26 (12.0)	14 (10.7)	12 (14.1)	3.70	0.72
	Lung	20 (9.3)	9 (6.9)	11 (12.9)		
	Breast	36 (16.7)	24 (18.3)	12 (14.1)		
	Gastrointestinal	52 (24.1)	31 (23.7)	21 (24.7)		
	Genitourinary	12 (5.6)	8 (6.1)	4 (4.8)		
	Gynecologic	67 (31.0)	43 (32.8)	24 (28.2)		
Time duration since diagnosis/mo	Others	3 (1.3)	2 (1.5)	1 (1.2)	3.31	0.19
	<6	34 (15.7)	16 (12.2)	18 (21.1)		
	6–12	30 (13.9)	20 (15.3)	10 (11.8)		
Cancer stage	>12	152 (70.4)	95 (72.5)	57 (67.6)	14.02	0.003
	T1	63 (29.2)	37 (28.3)	26 (30.6)		
	T2	26 (12.0)	11 (8.4)	15 (17.6)		
	T3	57 (26.4)	29 (22.1)	28 (33.0)		
Distant metastasis	T4	70 (32.4)	54 (41.2)	16 (18.8)	10.41	0.001
	M0	148 (68.5)	79 (60.3)	69 (81.2)		
Treatment	M1	68 (31.5)	52 (39.7)	16 (18.8)	6.28	0.18
	Surgery ^a	51 (23.6)	27 (20.6)	24 (28.2)		
	Chemotherapy	89 (41.2)	50 (38.2)	39 (45.9)		
	Radiotherapy	4 (1.9)	2 (1.5)	2 (2.4)		
	CRRT	11 (5.1)	8 (6.1)	3 (3.5)		
	Post-treatment ^b	61 (28.2)	44 (33.6)	17 (20.0)		

Italic bold values are significant.

Unless otherwise noted, values are the number (percentage) of patients.

^aPostoperative follow-up.

^bPostcancer treatment checkup.

CRRT, concurrent chemoradiotherapy.

treatment. CAM users had a significantly advanced stage of tumor ($p=0.003$) with more distant metastasis ($p=0.001$) than non-CAM users, but there were no differences in cancer types, time duration since cancer diagnosis, and types of cancer treatment between CAM users and non-CAM users (Table 2).

Prevalence and types of CAM use

Of 216 patients, 131 patients (60.6%) used at least one CAM (Table 3). On average, CAM users reported using 3.3 ± 2.4 different types of CAM. For specific categories of CAM, 23 patients (17.5%) used nonbiologically based therapies only, 36 patients (27.5%) biologically based therapies only, and 72 patients (55.0%) used both categories of CAM. Acupuncture was the most commonly used nonbiologically based therapy ($n=49$; 37.4%), whereas herbal medicine ($n=89$; 67.9%) was the most commonly used biologically based therapy, followed by use of vitamins ($n=71$; 54.2%), fatty acids ($n=26$; 19.8%), and minerals ($n=24$; 18.3%). Herbal medicine included dietary supplements approved by the MFDS ($n=62$; 47.3%), such as red ginseng ($n=26$; 19.8%) and mushroom ($n=24$; 18.3%), and natural foods not approved by the MFDS ($n=54$; 41.2%), such as firefly wormwood ($n=25$; 19.1%) and black garlic juice ($n=13$, 9.9%) (Table 3).

Association between CAM use and anxiety, depression, and QOL

Because a large proportion of the participants were not using any CAM, the association of CAM use with anxiety, depression, and QOL was examined by comparing

TABLE 3. FREQUENCIES OF THE USE FOR SPECIFIC COMPLEMENTARY AND ALTERNATIVE MEDICINE

Name (scientific name)	No. of users (%)
Nonbiologically based therapies ^a	95 (72.5)
Acupuncture	49 (37.4)
Heat treatment	18 (13.7)
Prayer	10 (7.6)
Relax massage	10 (7.6)
Hydrotherapy	8 (6.1)
Mugwort moxibustion	6 (4.6)
Biologically based therapies ^a	108 (82.5)
Vitamins	71 (54.2)
Minerals	24 (18.3)
Fatty acids	26 (19.8)
Amino acids and proteins	7 (5.3)
Dietary fiber	11 (8.3)
Probiotics	20 (15.3)
Herbal medicine	89 (67.9)
Approved by MFDS	62 (47.3)
Red ginseng	26 (19.8)
Mushroom	24 (18.3)
Others	22 (16.8)
Not approved by MFDS	54 (41.2)
Mistletoe	7 (5.3)
Dandelion	12 (9.2)
Firefly wormwood	25 (19.1)
Green vegetable juice	11 (8.4)
Black garlic juice	13 (9.9)
Others	32 (24.4)

^aMultiple doses.

MFDS, Ministry of Food and Drug Safety.

TABLE 4. COMPARISON OF ANXIETY, DEPRESSION, AND QUALITY OF LIFE BETWEEN COMPLEMENTARY AND ALTERNATIVE MEDICINE USERS AND COMPLEMENTARY AND ALTERNATIVE MEDICINE NONUSERS (N=216)

Characteristics	Categories	Total (N=216)	CAM user (n=131)	CAM nonuser (n=85)	χ^2/t	p
Anxiety		6.6±3.9	5.6±3.4	8.2±4.0	5.21	<0.001
Depression		7.4±4.2	6.3±3.9	9.0±4.2	4.90	<0.001
Quality of life						
Global health status	Total	52.7±23.7	53.2±22.7	51.8±25.4	0.45	0.66
Functioning	Physical	70.0±24.7	72.3±22.3	66.4±27.8	1.63	
	Role	71.2±30.5	72.1±29.7	69.8±31.8	0.55	
	Emotional	70.5±25.1	72.8±23.8	67.0±26.7	1.69	
	Cognitive	76.6±22.2	78.5±22.3	73.7±21.7	1.55	
	Social	69.8±29.2	68.7±29.2	71.6±29.3	-0.70	
Symptoms	Fatigue	41.0±27.2	40.4±26.6	42.0±28.4	-0.42	
	Nausea/vomiting	15.2±23.6	15.0±23.7	15.5±23.7	-0.15	
	Pain	24.0±30.2	22.8±29.3	25.9±31.6	-0.74	
	Dyspnea	20.2±28.7	20.1±29.4	20.4±27.7	-0.07	
	Insomnia	29.9±31.5	29.3±30.7	31.0±32.9	-0.39	
	Loss of appetite	28.7±32.5	28.5±32.3	29.0±32.9	-0.12	
	Constipation	24.7±31.5	20.4±27.9	31.4±35.4	-2.42	
	Diarrhea	17.3±25.9	15.8±23.1	19.6±29.7	-1.01	
	Financial difficulties	31.0±29.3	31.6±29.3	30.2±29.4	0.33	

Italic bold values are significant.

Unless otherwise noted, values are mean ± SD of patients.

CAM, complementary and alternative medicine.

differences between CAM users and non-CAM users on those variables. Compared with non-CAM users, CAM users had significantly lower levels of anxiety ($t=5.21$, $p<0.001$) and depression ($t=4.90$, $p<0.001$), but the two groups did not differ in QOL ($t=0.45$, $p=0.66$) (Table 4).

To determine how much variance in anxiety, depression, and QOL is explained by CAM use, we first controlled for the effects of covariates. Demographic and clinical factors showing significant Spearman's rho and Pearson correlation coefficients with anxiety, depression, and QOL were treated as covariates for each outcome. Significant covariates for anxiety were gender, BMI, time duration since cancer diagnosis, and cancer treatment type. For depression, significant covariates were gender and time duration since cancer diagnosis, and for QOL, only one significant covariate was time duration since cancer diagnosis. Hierarchical multiple linear regression analyses indicated that covariates accounted for 9.6%, 5.4%, and 3.8% variances in anxiety, depression, and QOL. After controlling for covariates, use of CAM was un-

iquely associated with 8.7% and 8.8% of variance in decreasing anxiety and depression, but there was no significant association of CAM use with variance in QOL (Table 5).

Discussion

The major findings of this study are that about 61% of Korean cancer patients are CAM users, and younger, more educated patients with higher incomes and advanced-stage cancer are more likely to use CAM with less consultation with a physician. Herbal medicine and acupuncture are among the most frequently used CAM followed by vitamins and fatty acids. When compared with non-CAM users, CAM users have significantly lower anxiety and depression but similar QOL.

The prevalence of CAM use in the literature has ranged from 23.6% to 79% among cancer patients.^{7,15-21} A large variability in the prevalence of CAM use may have been affected by factors such as different definitions of CAM,

TABLE 5. PREDICTORS OF ANXIETY, DEPRESSION, AND QUALITY OF LIFE

Predictor	Anxiety		Depression		QOL	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1 Covariates ^a	0.096***		0.054**		0.038**	
Step 2 Use of CAM	0.087***	-0.299***	0.088***	-0.299***	0.000	0.012
F	9.379***		11.780***		4.179*	
Total R ²	0.183***		0.143***		0.038	
Adjusted R ²	0.163		0.131		0.029	

^aCovariates include gender, BMI, time duration since cancer diagnosis, and cancer treatment for anxiety; gender and time duration since cancer diagnosis for depression; and time duration since cancer diagnosis for QOL.

* $P<0.05$, ** $P<0.01$, *** $P<0.001$.

QOL, quality of life.

different sample characteristics, variable methods of survey, and geographical locations of the study.^{20,21,38} For example, in one study, CAM was defined as medical interventions not taught widely at U.S. medical schools or not generally available at U.S. hospitals,³⁹ whereas in another study, CAM was defined as practices and products of nonmainstream origins.¹⁴ Because these definitions did not provide the specific types of CAM, responses may have varied by individual interpretation of CAM. Furthermore, CAM use appears to vary according to geographical location; in studies of similar cancer populations, the prevalence of CAM use was relatively lower in European countries (23.6–32%) than in Asian countries (around 55%).^{17,18,20,21} The prevalence of CAM use in cancer survivors appears to be higher than that in cancer patients who are receiving active treatment, up to 79% in American studies and 49.4% in European studies.^{15,32} Furthermore, the prevalence of CAM use can differ significantly by the mode of survey. In a German study of cancer patients, an internet survey indicated a CAM use rate of 77%, but when an oncologist asked the patients, 74% of these patients denied using CAM.⁴⁰ This large variability in the prevalence of CAM use has limited our understanding of the actual significance of CAM use. Therefore, we need to evaluate the prevalence of CAM use with precise definitions and proper survey tools for future planning and monitoring of CAM use in cancer patients.

The findings related to covariates of this study are mostly consistent with previous findings. CAM use has been higher in female gender,^{25,41} younger age,^{41,42} higher education level,^{18,41–43} higher income,^{25,41} palliative care setting,³² and positive family history of advanced cancer (stage IV and distant metastasis),^{18,42,43} although there was a nonsignificant association between CAM use and income.⁴⁴ In addition, more information on CAM appears to promote more CAM use.⁴⁵ Patients in this study indicated that only 36% consulted with their physicians. In another study, consultation with a medical practitioner on CAM was a little higher at 42%.⁴⁰ Most information on CAM use comes from families and friends (49%) and the media (39%)⁴⁶ with limited consultation with an oncologist or physician who is directly involved in active conventional cancer treatment. This lack of communication may result in undesirable consequences via potential interactions between conventional cancer treatment and particular types of CAM. More open discussions between healthcare providers and patients are essential to promote the best care possible for patients. Furthermore, healthcare provider need to get a general training program about CAM for providing cancer patients with more reliable information and preventing undesirable consequences.

Similar to previous findings,^{20–22} the most common CAM used was herbal medicine (67.9%), and the most common reason for using CAM was to increase the body's ability to fight cancer. In most Asian studies,^{22–24} the use of herbal medicine has been relatively high, compared with only 20%–25% of patients using herbal medicine in Western countries.^{25–28} Herbal medicine is used widely for various conditions among Asians and is thought to reduce distressful symptoms associated with cancer. Herbal medicine, however, may have unexpected side-effects such as increasing the risk of adverse bleeding,^{38,47,48} hepatotoxicity,^{48,49} neurotoxicity,⁴⁸ unwanted stimulation of the immune system,^{48,49} thrombocytopenia,⁴⁸ or renal failure,^{48,49} which can be highly detrimental

to patients. On the other hand, minerals and vitamins are more commonly used by Westerners than by Asians, and their side-effects have been well established.¹⁵ Once the side-effects of herbal medicine are better established, herbal medicine may be used more frequently by Westerners. Therefore, we need to evaluate the side-effects of herbal medicine in cancer patients and figure out the mechanisms of herbal medicine with regard to improving cancer-related symptoms.

CAM users had significantly lower anxiety and depression compared to non-CAM users in our study. After controlling for covariates, we found that CAM use uniquely explained 8.7% and 8.8% of variances in anxiety and depression, respectively, suggesting the potential efficacy of CAM use on emotional status. Some previous studies reported nonsignificant associations between CAM use and anxiety and depression,^{28,44} whereas in other studies, CAM treatment was reported to improve anxiety and depression.^{50,51} Given the competing views among previous reports,^{10,23} the correlation between CAM use and emotional well-being remains unclear. CAM use may result in an improved emotional state. In other words, patients with more subtle anxiety and depression symptoms may be more likely to pursue CAM versus those with severe symptoms. Fundamentally, this is an important issue since cancer patients may be exposed to inefficient emotional cares of which the effects cannot be completely understood through empirical measures. With regard to the current understood relationship between CAM use and emotional status in cancer patients, there is a lack of standardization that leads to unresolved issues related to the type of cares being taken, which CAMs are deemed effective, and how these care strategies work in relieving anxiety and depression. Therefore, well-designed prospective randomized controlled trials are needed to determine the potential relationship between CAM use and emotional improvement.

CAM use had no significant impact on QOL in this study. Also, a majority of investigators reported no significant difference in QOL between CAM users and non-CAM users among cancer patients.^{7,18,52–54} Furthermore, previous investigators reported that cancer patients with poor QOL were more likely to use CAM.⁵⁵ These reports raise an interesting question on causality and specific reasons for using CAM. For example, in a previous study with American breast cancer patients, nearly 90% of the patients reported using prayer as the most common CAM, and the reason for praying was largely to gain a feeling of control.¹⁰ Thus, the personal goals of CAM use are various, and the reason for using a particular type of CAM may be not for improving QOL. Further investigations on specific reasons for using CAM and the subsequent satisfaction and efficacy of achieving individual goals would be beneficial.

The limitations of this study include a potential sample selection bias because all participants were recruited from the outpatient clinic, excluding patients who were receiving high dose chemotherapy and certain types of cancer with extremely positive prognosis. Second, because of a cross-sectional design, the effects of CAM use on anxiety, depression, and QOL cannot be confirmed. When evaluating the efficacy of CAM use for cancer-related symptoms such as anxiety and depression a placebo effect should be considered in both cohort studies and well-designed comparative studies.⁵⁶ For example, if CAM use is shown to improve anxiety and depression in 50% of patients the benefits of a placebo treatment should be shown in less than 50% of patients. The

placebo effect is not well understood but may have had a strong influence of the results of the current study. Third, the study population was limited to Korean adult cancer patients and the findings of this study cannot be generalized beyond Korean culture and environments. Lastly, this investigation did not include further details on individual reasons for using each particular CAM or biobehavioral mechanisms to explain a potential link between CAM use and outcomes. Despite these limitations, findings of this study contribute to greater understanding on CAM use and its potential efficacy of CAM use on emotional status in Korean cancer populations.

Conclusion

CAM use was prevalent (61%) in Korean adult cancer patients. The most commonly used CAM was herbal medicine and acupuncture. CAM users had a significantly lower anxiety and depression than non-CAM users, and CAM use explained about a 9% reduction of anxiety and depression when controlling for covariates. Younger age, higher education levels, higher income, less physician consultation, and higher cancer stage were significant correlates to CAM use.

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