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The prevalence and pattern of complementary and alternative medicine use among cancer patients in a tertiary oncology center: a cross-sectional study

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Background: Complementary and alternative medicine (CAM) is widely used nationally and internationally for multiple medical conditions, including different stages of cancer. It is used by the patients for multiple purposes, including to cure diseases or resolve symptoms, as patients have the misconception that natural remedies are safer than radiotherapy and chemotherapy.
Objectives: The aim of this research is to investigate the prevalence, pattern, and purpose of CAM use by cancer patients at Princess Noorah Oncology Center (PNOC), King Abdulaziz Medical City, in Jeddah (KAMC-JD).
Methods: This was a cross-sectional study that examined 293 patients (selected through random computerized sampling) who were seen at PNOC during the study period. To be eligible for the study, participants had to be cancer patients over the age of 18 who were seen at PNOC. The authors excluded patients who had privacy requests or did not fit our inclusion criteria.
Results: Of the sample, 52.9% [95% confidence interval (CI), 47.0–58.7] used CAM. Only 5.8% of patients delayed their medical treatment to use CAM. A significantly higher proportion of females used CAM than males (61.8% vs. 40.0%, $P < 0.001$). The most common types of CAM were Zamzam water (67.7%), Quran recitation (42.6%), water read upon Quran (41.3%), and black seed (*Nigella sativa*) (41.3%). The most frequently reported reasons for CAM use were to treat cancer (53.5%), increase immunity (34.2%), and religious beliefs (23.9%). Generally, 57.4% of CAM users felt improvement with CAM modalities.
Conclusion: In conclusion, more than 50% of our sample used CAM; 5.8% of patients delayed the medical treatment to use CAM. The most common type of CAM was Zamzam water, and the most frequently reported reason for CAM use was to treat cancer. Of CAM users, 57.4% felt improvement with CAM modalities. Further studies that involve qualitative designs and include a more diverse sample are recommended in the Kingdom of Saudi Arabia to understand CAM utilization patterns.

Keywords: complementary therapies, neoplasms, therapeutics, traditional medicine practitioners

Introduction

Complementary and alternative medicine (CAM) is defined by the World Health Organization (WHO) as a 'broad set of health care practices that are not part of that country's own tradition or conventional medicine and are not fully integrated into the dominant health-care system'[1]. CAM in Saudi Arabia is monitored by the National Complementary and Alternative Medicine Center established by the Ministry of Health (MOH) and some private sectors[2]. CAM includes a wide range of interventions and practices. The field includes traditional alternative medicine such as acupuncture, homeopathy, and Oriental practices; body touch medicine reflecting healing by manual manipulation such as massage, yoga, and tai chi; herbal medicine; therapies focusing on mental health, such as meditation, biofeedback, and hypnosis; and therapies focusing on senses, such as visualization, art, and music[3]. Some of these practices showed encouraging results in treating and improving symptoms in cancer and non-cancer patients. For example, honey has antioxidant activity and the ability to delay the development of cancer and cardiovascular diseases[4].

The benefits of acupuncture, transcutaneous electrical nerve stimulation, supportive group therapy, self-hypnosis, and

HIGHLIGHTS

- More than 50% of our sample used complementary and alternative medicine (CAM) at our institution.
- 5.8% of the patients delayed their medical treatment to use CAM.
- 57.4% felt improvement with CAM modalities.

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massage therapy in providing pain relief in cancer pain have also been demonstrated[5]. However, there is a lack of clear evidence of the beneficial effect of CAM for symptomatic treatment or curative management and its long-term efficacy and safety.

Despite this, CAM is widely used nationally and internationally for multiple medical conditions. It is commonly used among patients with diabetes mellitus, insomnia, back pain, and many more. CAM has also been widely used among cancer patients in different stages of the disease for the purpose of curing cancer or resolving symptoms, as patients have the misconception that natural remedies are safer than radiotherapy or chemotherapy[6].

A 2005 study by Boon *et al.*[7], in Ontario, showed that 80% of women diagnosed with breast cancer used CAM, 41% of whom used it to treat their cancer. Another study from New Zealand reported that 30% of a total of 49% of cancer patients used different types of CAM to cure their cancer[8].

In Riyadh, Kingdom of Saudi Arabia (KSA), a 2018 cross-sectional study measured the prevalence of CAM use among cancer patients in oncology wards and outpatient clinics. It showed that 69.9% of its participants used CAM for different reasons (cure, improve mood, pain control), with supplications being the most used CAM[9]. However, as per the researcher's knowledge, there are no data estimating the practice of CAM among cancer patients in Jeddah. This study aims to investigate the prevalence, pattern, and purpose of CAM use by cancer patients at Princess Noorah Oncology Center (PNOC).

Methods

Study design

A cross-sectional study was conducted from 1 September through 30 November 2022, at PNOC at King Abdulaziz Medical City, Jeddah (KAMC-JD). PNOC is a tertiary cancer center with an 88-bed adult general oncology inpatient unit, a 22-bed bone marrow transplant unit, and a 32-bed pediatric hematology and oncology unit that includes pediatric bone marrow transplant services and a specialized pediatric oncology emergency room.

Study population and sampling technique

This study included cancer patients seen at PNOC at all stages of the disease. The target sample size was calculated based on Roasoft software, which detected an expected 50% prevalence of the problem, with a 5.7% margin of error and 95% confidence interval (CI) among a total population of 20 000 patients during 2022. The calculated sample size necessary was 292. A computerized random sampling technique was used in this study.

Inclusion and exclusion criteria

To be eligible for the study, participants must be cancer patients over the age of 18 who were seen at PNOC. We excluded patients who had privacy requests or did not fit our inclusion criteria.

Research instrument and data collection

The questionnaire used in this study was adopted from a previous study[9] after obtaining approval from the author via e-mail. International review board (IRB) approval was also obtained to use the questionnaire. We collected the data by interviewing the patients face to face. We conducted multiple training sessions to standardize and unify our interview approach and decrease interview bias as much as we can. The training included using the questionnaire, unifying clarification points, and filling out the data sheet. The work has been reported in line with the STROCSS criteria[10].

Ethical considerations

The study protocol and questionnaire were approved by the IRB office at King Abdullah International Medical Center (IRB Approval No. IRB/1091/22) on 14 June 2022. Written consent was obtained from all the participants prior to data collection. Confidentiality was assured by anonymous data collection and coding of the collected data in a database.

Statistical analysis

Data analysis was carried out using RStudio (R version 4.1.1). Data were expressed as frequencies and percentages. Items with multiple selections were analyzed using a multiple-response analysis. The prevalence of using CAM was assessed using a one-sample proportion test with continuity correction, and the

Table 1

Sociodemographic and clinical characteristics

Parameter	Category	*N* (%)
Location	OPD	93 (31.7%)
	IPS	200 (68.3%)
Age	< 18	22 (7.5%)
	18 to <30	15 (5.1%)
	30 to <45	44 (15.0%)
	45 to <60	102 (34.8%)
	60 or more	110 (37.5%)
Sex	Male	120 (41.0%)
	Female	173 (59.0%)
Marital status	Single	43 (14.7%)
	Married	202 (68.9%)
	Divorced	15 (5.1%)
	Widowed	33 (11.3%)
Education level	Uneducated	66 (22.5%)
	Primary	34 (11.6%)
	Intermediate	37 (12.6%)
	Secondary	64 (21.8%)
	Higher	92 (31.4%)
Employment	Employed	49 (16.7%)
	Unemployed	244 (83.3%)
Monthly income	Not mentioned	82 (28.0%)
	< 3000 SR	27 (9.2%)
	3000–6000 SR	83 (28.3%)
	> 6000 SR	101 (34.5%)
Smoking	Never smoked	212 (72.4%)
	Yes	15 (5.1%)
	Stopped	66 (22.5%)
Awareness about full diagnosis	Yes	251 (85.7%)
	No	42 (14.3%)
Type of cancer	Solid	204 (69.6%)
	Blood	90 (30.7%)
Stage of cancer	Metastatic	140 (47.8%)
	Non-metastatic	149 (50.9%)
	Not applicable	4 (1.4%)

IPS, inpatient service; OPD, outpatient department; SR, Saudi riyals.

prevalence rate was expressed using the respective 95% CIs. Factors associated with CAM use were investigated using a Pearson's Chi-squared test or a Fisher's exact test. The significantly associated variables were selected and used as independent variables in a multivariate, binary logistic regression model to explore the variables that were independently associated with CAM use. The outcomes were presented as odds ratio (OR) and the respective 95% CIs. Statistical significance was considered at $P < 0.05$.

Results

Sociodemographic and clinical characteristics

In the current study, we analyzed data from 293 palliative care patients. Most patients (72.3%) were aged 45 years and above, and 83.3% of them were unemployed. More than half were female (59.0%) and married (68.9%). Active smokers and ex-smokers represented 5.15% and 22.5% of the sample, respectively. More than two-thirds of patients (68.3%) were hospitalized. Most patients (85.7%) were aware of their diagnosis. Cancers were solid among 69.6% of patients, and 50.9% of them had non-metastatic lesions (Table 1). The common treatments used were chemotherapy (90.8%), radiation (43.0%), and surgery (36.2%) (Fig. 1).

Use of CAM

In general, 155 patients (52.9%) declared that they used CAM (95% CI: 47.0–58.7). All CAM users used alternative therapies before their cancer diagnosis. Only 5.8% of patients delayed their medical treatment to use CAM. Most patients indicated that the approximate cost of CAM therapies was 500 Saudi riyals (SR) or less (75.0%). The use of CAM modalities was supported by 9.7% of patients if they were discussed with a doctor and by 0.6% of patients if they were discussed with a health educator or a nurse (Table 2). On the other hand, 138 patients (47.1%) did not use CAM (95% CI: 41.3–53.0). The most common reasons for not using CAM were self-perceptions that CAM therapies were not good (35.8%) or that they did not cross patients' minds (23.4%) (Table 2).

Factors associated with CAM use

A significantly greater proportion of females used CAM than males (61.8% vs. 40.0%, $P < 0.001$). Furthermore, the proportions of widowed and married patients who used CAM (69.7% and 54.0%, respectively) were significantly greater than CAM users among single and divorced patients (41.9% and 33.3%, respectively; $P = 0.041$) (Table 3). No other demographic or clinical characteristics were associated with CAM use. In a multivariate analysis, the female gender was the sole significant

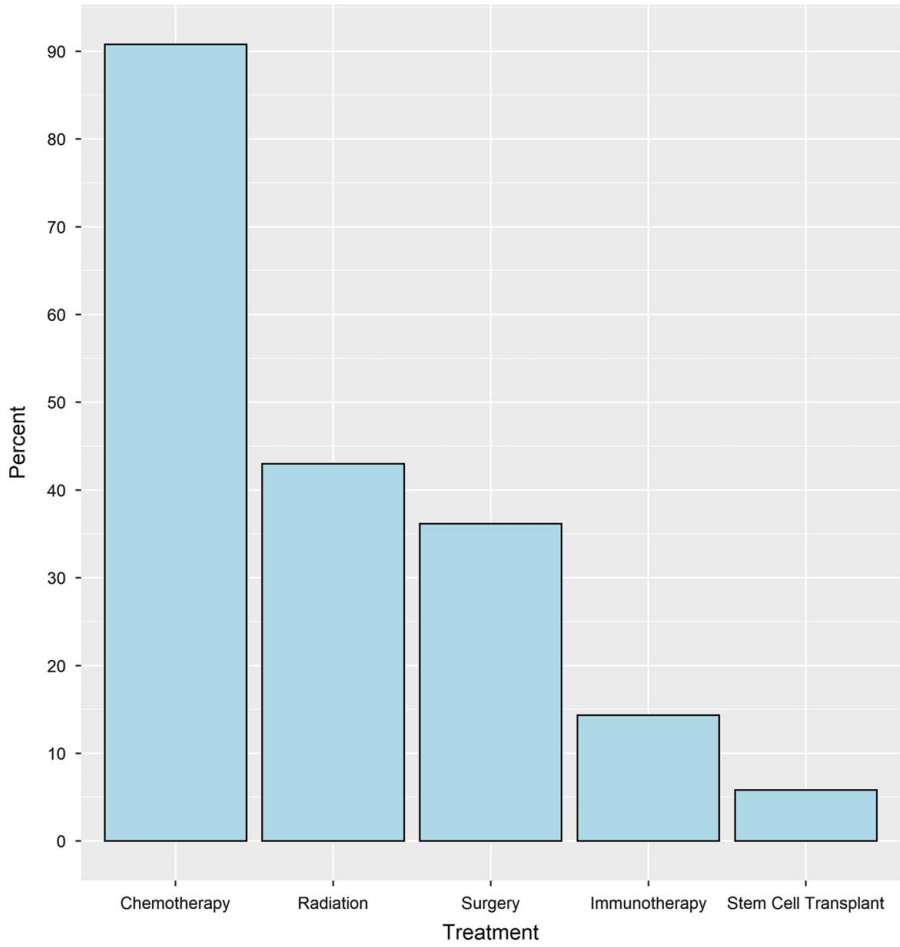

Figure 1. Percentages of treatments received by patients under study.

Table 2

Reasons of not using CAM and the patterns of CAM usage among patients

Domain	Parameter	Category	*N* (%)
No CAM use (*N* = 138)	Reasons for not using CAM[a]	Do not know	24 (17.5%)
		Did not cross my mind	32 (23.4%)
		Costly	0 (0.0%)
		Do not think it is good	49 (35.8%)
		My doctor told me it is not good	23 (16.8%)
		Other reasons	10 (7.3%)
	Other reasons for not using CAM	Giving priority to medical treatment	5 (50.0%)
		Lack of trust in CAM practitioners	1 (10.0%)
		Medical treatment is enough	2 (20.0%)
		Not ready	1 (10.0%)
		Unable to swallow (hypo-pharyngeal cancer)	1 (10.0%)
CAM use (*N* = 155)	When did you start?	Before illness	155 (100.0%)
		After illness	0 (0.0%)
	Delay treatment in order to use CAM	Yes	9 (5.8%)
		No	146 (94.2%)
	Approximate cost of CAM (SR)[b]	500 or less	60 (75.0%)
		> 500 to 2000	14 (17.5%)
		> 2000	6 (7.5%)
	Discussion and reaction if discussed with a doctor[a]	Support	15 (9.7%)
		Neutral	14 (9.1%)
		Do not support	28 (18.2%)
		No	97 (63.0%)
	Discussion and reaction if discussed with a health educator	Support	1 (0.6%)
		Neutral	3 (1.9%)
		Do not support	2 (1.3%)
		No	149 (96.1%)
	Discussion and reaction if discussed with a nurse	Support	1 (0.6%)
		Neutral	0 (0.0%)
		Do not support	1 (0.6%)
		No	153 (98.7%)

[a]The variables had one missing record.
[b]The variable had 75 missing records.
CAM, complementary and alternative medicine; SR, Saudi riyals.

Table 3

Factors associated with CAM use

		CAM use		
Parameter	Category	No, *N* = 138	Yes, *N* = 155	*P*
Location	OPD	49 (52.7%)	44 (47.3%)	0.191
	IPS	89 (44.5%)	111 (55.5%)	
Age	< 18	12 (54.5%)	10 (45.5%)	0.476
	18 to <30	8 (53.3%)	7 (46.7%)	
	30 to <45	25 (56.8%)	19 (43.2%)	
	45 to <60	43 (42.2%)	59 (57.8%)	
	60 or more	50 (45.5%)	60 (54.5%)	
Sex	Male	72 (60.0%)	48 (40.0%)	**< 0.001**
	Female	66 (38.2%)	107 (61.8%)	
Marital status	Single	25 (58.1%)	18 (41.9%)	**0.041**
	Married	93 (46.0%)	109 (54.0%)	
	Divorced	10 (66.7%)	5 (33.3%)	
	Widowed	10 (30.3%)	23 (69.7%)	
Education level	Uneducated	31 (47.0%)	35 (53.0%)	0.383
	Primary	11 (32.4%)	23 (67.6%)	
	Intermediate	19 (51.4%)	18 (48.6%)	
	Secondary	34 (53.1%)	30 (46.9%)	
	Higher	43 (46.7%)	49 (53.3%)	
Employment	Employed	25 (51.0%)	24 (49.0%)	0.547
	Unemployed	113 (46.3%)	131 (53.7%)	
Monthly income	Not mentioned	42 (51.2%)	40 (48.8%)	0.577
	< 3000 SR	13 (48.1%)	14 (51.9%)	
	3000–6000 SR	41 (49.4%)	42 (50.6%)	
	> 6000 SR	42 (41.6%)	59 (58.4%)	
Smoking	Never smoked	94 (44.3%)	118 (55.7%)	0.176
	Yes	10 (66.7%)	5 (33.3%)	
	Stopped	34 (51.5%)	32 (48.5%)	
Awareness about full diagnosis	Yes	122 (48.6%)	129 (51.4%)	0.207
	No	16 (38.1%)	26 (61.9%)	
Type of cancer	Solid	89 (43.6%)	115 (56.4%)	0.071
	Blood	49 (54.4%)	41 (45.6%)	0.094
	Other types	0 (NA%)	0 (NA%)	> 0.999
Stage of cancer	Metastatic	58 (41.4%)	82 (58.6%)	0.175
	Non-metastatic	78 (52.3%)	71 (47.7%)	
	Not applicable	2 (50.0%)	2 (50.0%)	
Type of treatment received	Surgery	49 (46.2%)	57 (53.8%)	0.822
	Radiation	54 (42.9%)	72 (57.1%)	0.206
	Chemotherapy	125 (47.0%)	141 (53.0%)	0.909
	Stem cell transplant	9 (52.9%)	8 (47.1%)	0.619
	Immunotherapy	16 (38.1%)	26 (61.9%)	0.207

CAM, complementary and alternative medicine; OPD, outpatient department; IPS, inpatient service; SR, Saudi riyals.
bold value are statistical significance $p < 0.05$.

predictor of CAM use among patients under study (OR = 2.32; 95% CI: 1.42–3.82; $P < 0.001$) (Table 4).

Patients' practice of CAM use

Focusing on CAM users ($n = 155$), the most common reasons for CAM use were social beliefs (47.7%), religious beliefs (45.8%), and advice from family members (38.7%) (Fig. 2). The most common types of CAM were Zamzam water (67.7%), Quran recitation (42.6%), water read upon a Quran (41.3%), and black seed (*Nigella sativa*) (41.3%). The most frequently reported reasons for CAM use were to treat cancer (53.5%), increase immunity (34.2%), and religious beliefs (23.9%). Generally, 89 CAM users felt improvement with CAM modalities (57.4%), and 66 patients did not find any benefit (42.6%). Of those who had improvements, the most common benefits included an enhanced appetite (41.6%) and an enhanced mood (32.6%). CAM modalities caused improvement exclusively among 19.1% of patients,

Table 4

Results of the predictors of CAM use among cancer patients

Parameter	Category	OR	95% CI	*P*
Sex	Male	–	–	
	Female	2.32	1.42, 3.82	**< 0.001**
Marital status	Single	–	–	
	Married	1.45	0.74, 2.91	0.284
	Divorced	0.53	0.14, 1.80	0.318
	Widowed	2.28	0.86, 6.32	0.102

OR, odds ratio; CI, confidence interval.
bold value is statistical significance $p < 0.05$.

and medical treatment caused improvement among 11.2% of patients, while both medical and CAM therapies caused improvements among 62.9% of patients (Table 5). More details about other types of CAM modalities, other reasons for CAM use, and other benefits encountered by patients are provided in the supplementary tables (Table S1, Supplemental Digital Content 1, http://links.lww.com/MS9/A256, Table S2, Supplemental Digital Content 1, http://links.lww.com/MS9/A256, and Table S3, Supplemental Digital Content 1, http://links.lww.com/MS9/A256, respectively).

Discussion

The current study aimed to analyze the patterns of utilizing CAM among cancer patients in the KSA. Multiple studies have reported the use of CAM in oncology units to support the treatment of different types of cancer[7–12]. According to a study by Boon *et al.*[7], 80% of women diagnosed with breast cancer used CAM; among them, 41% used it to manage their cancer in 2005. In addition, 30% of a total of 49% of cancer patients in a New Zealand study reported the use of different types of CAM to cure their cancer[8]. The current study reported a greater percentage of CAM use, with 52.9% of the study sample being CAM users; 51.4% of cancer patients were fully aware of their diagnosis and 48.6% were unaware (Table 1). Other studies reported a lower prevalence of CAM use among cancer patients. For example, a study by Risberg *et al.*[10,11] reported the use of palliative treatment, such as alternative medicine, mostly among non-curative malignant cancer patients. In addition, only 14% of cancer patients used CAM in a study in Malaysia.

It is also important to note the various purposes for CAM therapy initiation. Chrystal *et al.*[8], Al-Naggar *et al.*[12], and Chui *et al.*[13] reported the utilization of CAM therapies after patients' diagnosis as a means to cure them, improve their health outcomes and quality of life, and reduce the side effects of traditional treatments. However, none of the patients in the current study reported the use of CAM after their cancer diagnosis (Table 2). A possible reason for this finding could be the obstacles to CAM use, such as its high cost, limited accessibility, and lengthy duration[13]. Another explanation, according to Risberg *et al.*'s study, is that younger patients are more likely to use alternative therapies than older patients, and our study mostly consisted of older patients[10]. Bennett *et al.* found an association between information-seeking and CAM use depending on patient age ($P = 0.02$)[14], with younger patients seeking information more than older patients and thus utilizing CAM alongside conventional treatment more often. Based on prior research papers, patients' demographics can also affect the decision to use CAM for cancer treatment. For example, Risberg *et al.*'s study found that women, college graduates, and those with higher socioeconomic status tend to seek alternative medicine therapies more than males and patients with lower education and socioeconomic status[11]. Similarly, Richardson *et al.* reported that being young and female increased the use of CAM among patients[15]. This finding was consistent with the findings

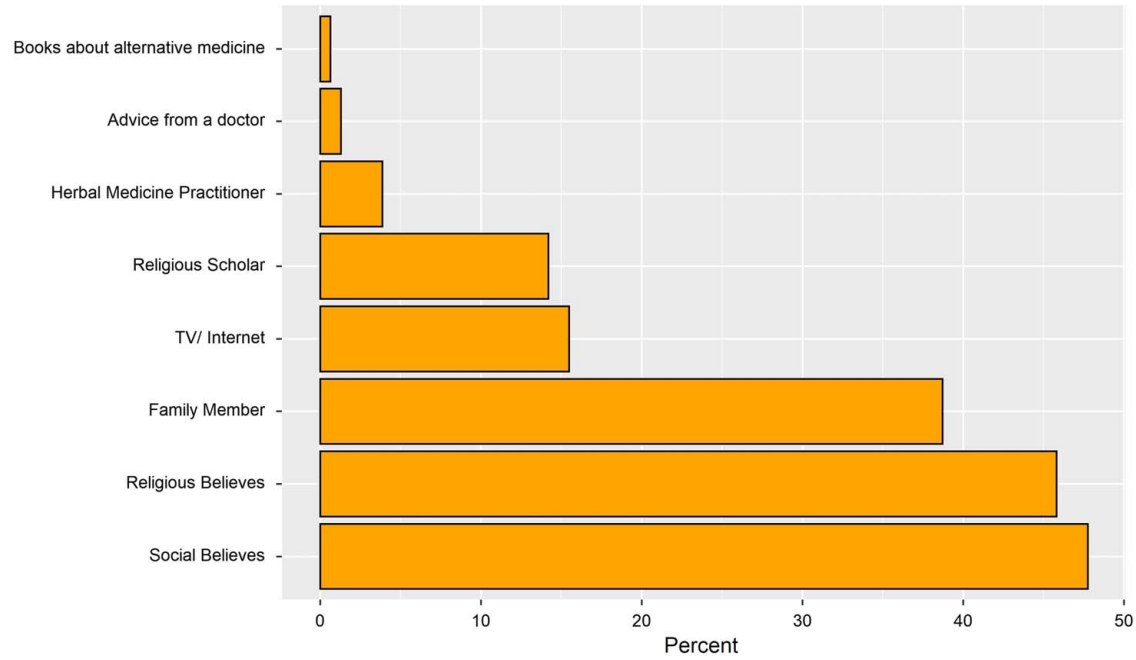

Figure 2. Percentages of reasons for CAM use.

Table 5

Patterns of CAM practice among patients under study

Parameter	Category	*N* (%)
Used CAM types	Supplication	51 (32.9%)
	Quran recitation	66 (42.6%)
	Zamzam water	105 (67.7%)
	Water read upon Quran	64 (41.3%)
	Black seed	64 (41.3%)
	Camel milk	44 (28.4%)
	Camel urine	24 (15.5%)
	Garlic	60 (38.7%)
	Olive oil	54 (34.8%)
	Multivitamin	8 (5.2%)
	Known herbal remedies	36 (23.2%)
	Unknown herbal mixture	8 (5.2%)
	Other types of CAM	97 (62.6%)
Reasons for CAM use	Decrease tumor size	10 (6.5%)
	Decrease pain	14 (9.0%)
	Treat cancer	83 (53.5%)
	Increase appetite	5 (3.2%)
	Increase physical strength	20 (12.9%)
	Increase immunity	53 (34.2%)
	Religious beliefs	37 (23.9%)
	Improve mood level	4 (2.6%)
	Social beliefs	25 (16.1%)
	Other reasons	20 (12.9%)
Type of improvement felt	Decreased pain physical strength[a]	0 (0.0%)
	Enhanced appetite[a]	37 (41.6%)
	Enhanced mood[a]	29 (32.6%)
	Enhanced physical strength[a]	27 (30.3%)
	Other types of improvement[a]	32 (36.0%)
	I did not see any benefit	66 (42.6%)
Reason for improvement[a]	CAM used	17 (19.1%)
	Medical treatment given by your treating doctor	10 (11.2%)
	Both of them	56 (62.9%)
	N/A	6 (6.7%)

[a]Descriptive data are based on the responses of 89 patients who felt improvements with CAM use. Patients were able to select multiple selections for all parameters.
CAM, complementary and alternative medicine.

from our study, as gender was significantly associated with and predictive of greater CAM use among females compared to males ($P < 0.001$). Though the cost of CAM therapies and socioeconomic status were reported to affect the decision to use CAM[13,16], the current study did not find any association between monthly income and CAM use (Table 3). Our study also reported a significant association between being married and greater CAM use ($P = 0.041$). However, marital status was not a sufficient predictor of CAM utilization (Tables 3 and 4). This finding was contradicted by the findings of Al-Naggar *et al.*[12], who did not find an association between marital status and the use of alternative medicine ($P = 0.446$). In addition, our study did not report education to be associated with CAM use, a finding that is similar to the findings of Al-Naggar[12], and contradicts the findings of Chui *et al.*[13], who reported higher education to be associated with greater CAM use.

Ernst explained that while CAM use is widespread, there are inconsistencies noted in its use that are not associated with regional differences or growing popularity but rather with the understanding of the concept of alternative medicine by patients and care providers[16]. For instance, a study of advanced-stage cancer patients by Correa-Velez *et al.* reported that CAM modalities were perceived primarily as complementary rather than alternative to conventional cancer treatments by most participants[17]. The researchers indicated that a person with a life-threatening disease such as cancer makes a pragmatic decision to use CAM[17]. To have an in-depth understanding of patients' motivations and patterns of use, it is also important to look at those who are against CAM utilization. In general, Singh *et al.* emphasized that users of complementary medicine view its use as holistic and harmless, while conventional medicine is viewed as hostile and isolated[18]. Singh *et al.* added that conventional treatment may have been perceived by CAM users as a means of prolonging life rather than as a means of curing cancer[18]. On the other hand, Ernst emphasized that the current evidence available on CAM's benefits and risks is not sufficient to support its use on cancer patients[16]. Among the 138 patients who did not use CAM in our study, the majority (35.8%) believed that CAM was not good for their condition. Similarly, in the qualitative study by Boon *et al.*, CAM was most frequently avoided by breast cancer survivors due to inadequate safety and efficacy information[19]. CAM users in the Richardson *et al.*'s study were more likely to think that CAM could cure cancer, improve quality of life, improve immunity, and prolong life than patients who received conventional cancer treatment[20]. Likewise, Chrystal *et al.*[8] found that using CAM was believed to enhance the quality of life and cure cancer among 47% and 30% of patients, respectively. In their qualitative study that included prostate cancer patients, Boon *et al.* argued that negative experiences with traditional treatment play a key role in patients' decisions and are attributed to pushing them toward the use of CAM[21].

As for the type of CAM employed, a combination of CAM therapies was used by the patients in this study (Table 4), a finding that is consistent with multiple prior studies[7–21]. Chrystal *et al.*[8] reported frequent use of other types of CAM, such as vitamins and antioxidants. Chui *et al.* reported natural products and mind–body practices to be the most commonly used CAM among breast cancer patients[13], while a study in Turkey reported herbal products, more specifically stinging nettle (*Urtica dioica*), as the most common CAM used among cancer patients[22]. Multiple studies reported high usage of Zamzam water among Muslim cancer patients ranging from 59.8% to 93.9%, which goes with our findings and has been used as a religious healing agent[6,9,23,24]. Currently, vitamin supplements, herbal medicine, and dietary treatments are being promoted as means to cure cancer. However, Ernst explained that no credible clinical evidence has been provided to support any of these treatments[25]. Due to the reported effect of age on the decision to use CAM, the current study is limited, as a more diverse sample is required. In addition, given the fact that there are cases of non-disclosure to the clinician when it comes to CAM use[14], the use of a questionnaire as a data set increases the chances of response bias. Further studies that involve qualitative designs and include a more diverse sample are recommended in the KSA to understand CAM utilization patterns. In addition, studies that explore the ways that CAM is utilized by cancer patients are essential to avoid possible adverse events from some CAM therapies used. However, to our knowledge, this is the first study to estimate the practice of CAM among cancer patients in Jeddah.

Conclusion

In conclusion, more than 50% of our sample used CAM; 5.8% of the patients delayed their medical treatment to use CAM. The

most common type of CAM was Zamzam water, and the most frequently reported reason for CAM use was to treat cancer. Of CAM users, 57.4% felt improvement with CAM modalities. Further studies that involve a qualitative design and include a more diverse sample are recommended in the KSA to understand CAM utilization patterns.

Ethical approval

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by King Abdullah International Medical Research Centre ethics review board (IRB Approval No. IRB/1091/22) on 14 June 2022.

Consent

Written informed consent was obtained from all the study participants for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

N.A.A.: conceptualization, software, formal analysis, supervision, and project administration; N.A.A., L.A.B., and H.M.A.: methodology, validation, and writing – original draft preparation; L.A.B., H.M.A., J.M.A., N.M.A., and W.A.A.: investigation; L.A.B. and H.M.A.: resources and funding acquisition; N.A.A., L.A.B., H.M.A., J.M.A., N.M.A., and W.A.A.: data curation, writing – review and editing, and visualization. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement

The study protocol and questionnaire were approved by the IRB office at King Abdullah International Medical Center (IRB Approval No. IRB/1091/22) on 14 June 2022. Confidentiality was assured by anonymous data collection and coding of the collected data in a database.

Conflicts of interest disclosure

The authors declare no conflicts of interest.

Research registration unique identifying number (UIN)

1. Name of the registry: www.researchregistry.com.
2. Unique identifying number or registration ID: researchregistry 9222.
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): https://www.researchregistry.com/browse-theregistry#home/registrationdetails/64a3d4bb3c80d50027056ecb/.

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Data availability statement

The study data were obtained from the subjects and are available with the principal investigator and available as per institute and journal policies.

Provenance and peer review

Not commissioned, externally peer-reviewed.

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