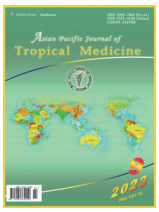

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Attitudes and understanding of complementary and alternative medicine in cancer care: An exploratory study of patients' perspectives in Karachi, Pakistan

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ABSTRACT

Objective: To evaluate the prevalence and types of complementary and alternative medicine (CAM) modalities among patients with cancer in Karachi, Pakistan.

Methods: This descriptive cross-sectional study was conducted from March 2021 to December 2021. Five hundred patients with cancer were invited to participate in the study. Electronic databases, namely, Google scholar, Publons, EMBASE, PubMed, Chinese National Knowledge Infrastructure Database, and ResearchGate was used for questionnaire designed. The self-administered survey included questions on demographic characteristics, education level, socio-economic conditions and information about CAM therapies, prevalence, effectiveness, and common CAM modalities. Statistical analysis was conducted using SPSS software version 22.

Results: Out of the 500 invited patients, 433 (86.6%) successfully completed and returned the questionnaires. In contrast to patients who were with younger, highly educated, professionally active, higher income, and had advanced cancer, time since diagnosis, type of treatment, cancer types and family history are significantly associated with CAM use. The results showed that 59.8% of the participants were acquainted with complementary and/or alternative medicine and considered safe owing to its natural ingredients. The prevalence of CAM usage among cancer patients was 40.9% and the most widely used CAM modality was herbal medicine (27.7%) and dietary supplements (28.8%). Patients used CAM as a complementary therapy to improve the morphological parameter (28.2%), strengthen the immune system (6.8%), and to decrease the side effects of conventional treatment (18.1%). Most of the respondents get the information regarding CAM therapy from the

Significance

Complementary alternative medicine has been widely used among cancer patients throughout the world to improve their quality of life. Complementary alternative medicine used by cancer patients are more likely to be used as adjuvants to reduce the side effects of the cancer and conventional treatments. Therefore, the present study that includes a broader set of questions may help to better understand the attitudes of the patients regarding complementary alternative medicine therapies.

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electronic media (43.2%) and the family members (48%) rather than healthcare personnel.

Conclusions: Participants used CAM modalities along with the conventional health care practices. Further multicentre studies should be conducted to provide information regarding the usage of CAM therapies and their eventual benefits in patients with cancer.

KEYWORDS: Alternative medicine; Cancer patients; Complementary medicine; Cross-sectional study

1. Introduction

Cancer is one of the most prevalent disease throughout the world associated with the maximum number of deaths. Approximately 9.6 million cancer fatalities and 18.1 million newly diagnosed cancer cases had been reported in 2018[1]. Several studies revealed that the prevalence of cancer is higher in developed countries than in low-income countries. Although of the advancement of modern techniques, the management of cancer always seems to be challenging and less than 60% success rate had been reported[2]. The term "complementary and alternative medicine (CAM)" refers to a comprehensive set of non-mainstream health care practices that are not a part of conventional treatment. For instance, herbal medicines, herbal remedies, herbal teas, phytotherapy, minerals, probiotics, nutraceuticals, and functional foods. Practices such as mind-body therapies, aromatherapy, homeopathy, exercises, yoga, massage, manipulations, acupuncture, and meditation also associated with CAM therapies[3]. Nowadays a new approach has been introduced in western medicine *i.e.* "integrative medicine;" According to the National Centre for Complementary and Integrative Health, "CAM therapy, namely, lifestyle changes, rehabilitation, psychotherapy, herbal remedies and phytomedicine can be used along with conventional medicine. During the last decades, the usage of CAMs among cancer patients have been extensively increased. Around 30%-90% of CAM use among patients with cancer had been reported throughout the world. For instance, the prevalence of CAM therapy in Europe is about 36%, 70%-83% in the United States, 46% in Japan, 60% in Canada, 85% in Tunisia, and 98% had been reported in Shanghai[4,5]. The most widely used CAM therapy was herbal medicine, diet/food therapy, and homeopathy medicinal plants or herbs have anti-apoptosis, anti-inflammatory, and antioxidant properties and contain several bioactive compounds, namely, flavonoids, tannins, carotenoids, lignans, coumarins, and phenolic compounds are pharmacologically active against cancer cells. Various studies demonstrated that the phytomedicine or herbal medicines lowered the mortality rate in cancer patients, reduced the adverse effects of conventional drugs, improved physical well-being and improved the quality of life[6,7]. Karachi, Pakistan is an enormously populated city in Southeast Asia. Owing to their heterogeneity in terms of language, ethnicity, lifestyle, and dietary habits; the statistic of various types of cancer malignancies obtained from specific regions often vary considerably. Pakistan has remarkable biodiversity of both fauna and flora and most of the alternative medicines are derived from plants, herbs, or shrubs[8–10]. Therefore, the present study aims to determine the prevalence of CAM usage among cancer patients who lived in Karachi, Pakistan.

2. Subjects and methods

2.1. Study design

A descriptive cross-sectional study had been executed from March 2021 to December 2021 at various oncological centers and wards of different hospitals in Karachi, Pakistan. A total of 500 patients with cancer were selected randomly from the inpatient, and outpatient departments of various private, semi private & government oncological centers and wards of different hospitals of Karachi, Pakistan.

A comprehensive literature review using electronic databases, namely, Google Scholar, EMBASE, Publons, PubMed, Chinese National Knowledge Infrastructure Database, and ResearchGate was used for the questionnaire design. After a literature review, the study questionnaire was constructed and assessed by experienced pharmacists and researcher of Faculty of Pharmacy & Pharmaceutical Sciences, University of Karachi, Pakistan. Information about the research was given verbally to each participant and pharmacists explained the CAM therapy to the study participants administered the questionnaire.

2.2. Reliability and validity analysis

The questionnaire was evaluated using a five-point Likert scale (Likert 1932). The respondents rate their responses based on agreement or disagreement, selecting the best appropriate responses. The responses were noted as "strongly disagree", "disagree", "neutral", "agree", and "strongly agree". Additionally, the strength of the items was determined using factor analysis of the Scale (Principal Component Factor) with varimax rotation. All items were allocated a factor with a loading greater than 0.4. Internal consistency was assessed by using Cronbach's alpha and was found to be in acceptable ranges. The reliability of the questionnaire was found to be 0.912 demonstrating that the scale has good reliability. The Kaiser-Meyer-Olkin test value was found to be 0.922 which was acceptable within the limits value (>0.60). Bartlett's test

Table 1. Socio-demographic profile of study participants [*n* (%)].

Characteristics	All (*n*=433)	CAM user (*n*=177)	Non-CAM user (*n*=256)	*P* value
Sex				
Male	175 (40.4)	72 (40.7)	103 (40.2)	0.926
Female	258 (59.6)	105 (59.3)	153 (59.8)	
Age, years				
21-30	129 (29.8)	50 (28.2)	79 (30.9)	0.838
31-40	96 (22.2)	44 (24.9)	52 (20.3)	
41-50	77 (17.8)	32 (18.1)	45 (17.6)	
51-60	64 (14.8)	25 (14.1)	39 (15.2)	
>60	67 (15.5)	26 (14.7)	41 (16.0)	
Marital status				
Married	256 (59.1)	96 (54.2)	160 (62.5)	0.319
Single	127 (29.3)	58 (32.8)	69 (27.0)	
Widowed	31 (7.2)	13 (7.3)	18 (7.0)	
Divorced	19 (4.4)	10 (5.6)	9 (3.5)	
Have any child				
Yes	288 (66.5)	116 (65.5)	172 (67.2)	0.720
No	145 (33.5)	61 (34.5)	84 (32.8)	
Residing area				
Urban	336 (77.6)	139 (78.5)	197 (77.0)	0.699
Rural	97 (22.4)	38 (21.5)	59 (23.0)	
Education level				
Postgraduate	43 (9.9)	20 (11.3)	23 (9.0)	0.565
University	154 (35.6)	64 (36.2)	90 (35.2)	
College	88 (20.3)	35 (19.8)	53 (20.7)	
Secondary school	51 (11.8)	15 (8.5)	36 (14.1)	
Primary school	61 (14.1)	27 (15.3)	34 (13.3)	
Illiterate	36 (8.3)	16 (9.0)	20 (7.8)	
Employment status				
Unemployed	192 (44.3)	81 (45.8)	111 (43.4)	0.677
Employed (Private)	105 (24.2)	38 (21.5)	67 (26.2)	
Employed (Public)	106 (24.5)	44 (24.9)	62 (24.2)	
Retired	30 (6.9)	14 (7.9)	16 (6.3)	
Monthly income (USD)				
Non-response	238 (55.0)	99 (55.9)	139 (54.3)	0.792
<175	50 (11.5)	17 (9.6)	33 (12.9)	
<350	71 (16.4)	32 (18.1)	39 (15.2)	
350-1 000	55 (12.7)	22 (12.4)	33 (12.9)	
⩾1 000	19 (4.4)	7 (4.0)	12 (4.7)	
Smoking status^				
Non-smoker	315 (72.7)	119 (67.2)	196 (76.6)	0.062
Current smoker	90 (20.8)	42 (23.7)	48 (18.8)	
Former smoker	28 (6.5)	16 (9.0)	12 (4.7)	
Types of tumor				
Cancer	365 (84.3)	140 (79.1)	225 (87.9)	0.013
Solid tumor	68 (15.7)	37 (20.9)	31 (12.1)	
Cancer types				
Breast	97 (22.4)	39 (22.0)	58 (22.7)	<0.001
Liver	57 (13.2)	26 (14.7)	31 (12.1)	
Blood	49 (11.3)	29 (16.4)	20 (7.8)	
Stomach	41 (9.5)	1 (0.6)	40 (15.6)	
Ovarian	39 (9.0)	23 (13.0)	16 (6.3)	
Brain	38 (8.8)	17 (9.6)	21 (8.2)	
Lungs	30 (6.9)	7 (4.0)	23 (9.0)	
Lymphoma	30 (6.9)	10 (5.6)	20 (7.8)	
Mouth	21 (4.8)	16 (9.0)	5 (2.0)	
Colon cancer	18 (4.2)	4 (2.3)	14 (5.5)	
Bone	13 (3.0)	5 (2.8)	8 (3.1)	

Table 1. Continued.

Characteristics	All (*n*=433)	CAM user (*n*=177)	Non-CAM user (*n*=256)	*P* value
Cancer stage				
Benign	78 (18.0)	36 (20.3)	42 (16.4)	0.719
Malignant 1	136 (31.4)	57 (32.2)	79 (30.9)	
Malignant 2	61 (14.1)	26 (14.7)	35 (13.7)	
Malignant 3	59 (13.6)	21 (11.9)	38 (14.8)	
Malignant 4	5 (1.2)	1 (0.6)	4 (1.6)	
Do not know	94 (21.7)	36 (20.3)	58 (22.7)	
Time since diagnosis				
0-4 months	96 (22.2)	38 (21.5)	58 (22.7)	0.003
5-8 months	145 (33.5)	75 (42.4)	70 (27.3)	
9-12 months	55 (12.7)	14 (7.9)	41 (16.0)	
>1 year	137 (31.6)	50 (28.2)	87 (34.0)	
Type of treatment				
Radiotherapy	18 (4.2)	5 (2.8)	13 (5.1)	<0.001
Chemotherapy	193 (44.6)	90 (50.8)	103 (40.2)	
Hormonal therapy	8 (1.8)	8 (4.5)	0 (0.0)	
Radio & chemotherapy	105 (24.2)	37 (20.9)	68 (26.6)	
Surgery	62 (14.3)	27 (15.3)	35 (13.7)	
Radio/chemotherapy & surgery	28 (6.5)	6 (3.4)	22 (8.6)	
Radio & surgery	9 (2.1)	2 (1.1)	7 (2.7)	
Chemotherapy & surgery	10 (2.3)	2 (1.1)	8 (3.1)	
Family history of cancer				
Yes	114 (26.3)	60 (33.9)	54 (21.1)	<0.001
No	237 (54.7)	79 (44.6)	158 (61.7)	
Not aware	82 (18.9)	38 (21.5)	44 (17.2)	

^Non-smoker: someone who has not smoked more than 100 cigarettes in their lifetime and does not currently smoke; Active smoker: somenoe who has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes; Ex-smoker: someone who has smoked more than 100 cigarettes in their lifetime but has not smoked in the last 28 days. CAM: Complementary and alternative medicine.

of Sphericity (*Chi*-square 3.132E3, *P*<0.001) was found to be significant suggesting the validity of factor analysis as well as data fit for reduction. Factor analysis was completed on 14 items. The factor loading of all selected items was noted from 0.362 to 0.802. The value of the factors ranged between 0.6-1.0, indicating the high quality of factors loadings (Kline, 1994).

A pilot study had been executed on a group of 25 cancer patients and the questionnaire was modified according to the results of the pilot study.

2.3. The questionnaire

The questionnaire comprised a total of 24 questions; some questions permitting auxiliary options for the participants to complete the answer. For 14 questions patients were allowed to pick a single response while 10 questions were permitted to choose 1 or more responses. Socio-demographic characteristics like sex, age, marital status, education, employment status, income level, residence, and information regarding cancer diagnosis (time of diagnosis, stage of disease), type of cancer disease (*e.g.*, breast, lung, brain, ovary, mouth, brain, stomach, lymphoma and blood cancer) and pattern of treatment (*e.g.*, chemotherapy, radiotherapy, surgery) were evaluated. Accordingly, CAM status (*e.g.*, beliefs of participants, reasons for the usage of CAM, and various types of CAM therapy) were assessed.

2.4. Statistical analysis

Statistical Package for Social Sciences version 22 (SPSS. Inc. Chicago. IL) was used for statistical analysis. Categorical variables were presented as frequencies and percentages. Pearson's *Chi*-square was applied to assess the association between socio-demographic factors and miscellaneous questions included in the design questionnaire. *P* value <0.05 was considered as significant.

2.5. Ethical considerations and participants' consent

The research protocol was approved by the advanced Board of the Studies University of Karachi, Karachi-Pakistan. Ethical approval was obtained from the Institutional Bioethical Committee, University of Karachi. Informed consent was obtained from all subjects who involved in the study.

3. Results

3.1. Socio–demographic data

Out of the 500 invited patients, 433 (86.6%) completed and

Table 2. Patients' believes regarding the effectiveness of complementary and alternative medicine usage [*n* (%)].

Characteristics	CAM user (*n*=177)		Non-CAM user (*n*=256)		Total (*n*=433)	
	Yes	No	Yes	No	Yes	No
1. Are you aware of CAM therapy?	140 (79.1)	37 (20.9)	119 (46.5)	137 (53.5)	259 (59.8)	174 (40.2)
2. Do you know the different types of CAM therapy?	125 (70.6)	52 (29.4)	89 (34.8)	167 (65.2)	214 (49.4)	219 (50.6)
3. Do you think CAM therapy can be used to help maintain and promote health?	150 (84.7)	27 (15.3)	118 (46.1)	138 (53.9)	268 (61.9)	165 (38.1)
4. Do you think CAM therapy are safe because they are made from natural ingredients?	132 (74.6)	45 (25.4)	130 (50.8)	126 (49.2)	262 (60.5)	171 (39.5)
5. Do you think CAM therapy have any side effects?	80 (45.2)	97 (54.8)	165 (64.5)	91 (35.5)	245 (56.6)	188 (43.4)
6. Do you personally used CAM therapy for treating the any disease?	136 (76.8)	41 (23.2)	74 (28.9)	182 (71.1)	210 (48.5)	223 (51.5)
7. Have you tried CAM therapy for cancer treatments?	177 (100.0)	0 (0)	0 (0)	256 (100.0)	177 (40.9)	256 (59.1)
8. Do you believed that CAM is used to manage the symptoms associated with cancer?	139 (78.5)	38 (21.5)	87 (34.0)	169 (66.0)	226 (52.2)	207 (47.8)
9. Do you consider CAM therapy are good for you than conventional medicines?	100 (56.5)	77 (43.5)	68 (26.6)	188 (73.4)	168 (38.8)	265 (61.2)
10. Have you had any better effect of this combination?	125 (70.6)	52 (29.4)	60 (23.4)	196 (76.6)	185 (42.7)	248 (57.3)
11. Have you had any un pleasant side effect of this combination?	79 (44.6)	98 (55.4)	58 (22.7)	198 (77.3)	137 (31.6)	296 (68.4)
12. Do you think that concurrent use of CAM & conventional treatment of cancer is safe?	127 (71.8)	50 (28.2)	78 (30.5)	178 (69.5)	205 (47.3)	228 (52.7)
13. Do you think that is there any guidance available regarding the use of CAM by health Care providers?	83 (46.9)	94 (53.1)	72 (28.1)	184 (71.9)	155 (35.8)	278 (64.2)
14. Have you inform their physicians or a pharmacist before using CAM therapy?	99 (55.9)	78 (44.1)	71 (27.7)	185 (72.3)	170 (39.3)	263 (60.7)

CAM: Complementary and alternative medicine.

returned the questionnaires successfully. The findings of the present study showed that the knowledge, perception, and attitude of respondents regarding the usage of CAM therapies have been significantly (P<0.05) associated with several factors: sex, age, marital status, education level, employment status, higher income, residence, smoking status, diagnosis, type, and cancer stage.

The results indicated that 59.6% (n=258) of the participants were female while only 40.4% (n=175) were male. The mean age of the respondents was (42.4±0.7) years (min-max range: 21-70 years; median 40 years). 65.8% Respondents had higher-level education while only 8.3% were illiterate. 44.3% Of the patients were unemployed whereas 48.7% were employed (private jobs 24.2% and 24.5% public employed). 55.0% Of the study participants didn't disclose their monthly income while 16.4% of respondents had less than 350 $ salaries. Around 77.6% of the population lived in urban areas while 22.4% of respondents lived in rural areas of the city. 59.1% Of the study participants were married, whereas 29.3% were unmarried. 54.7% Of the respondents didn't have a cancer history in their family. The result indicated that 84.3% of the disease was cancer while only 15.7% of study participants had solid tumors. 22.4% Patients were diagnosed with breast cancer. Subsequently, liver cancer (13.2%), blood cancer (11.3%), ovarian (9.0%), stomach cancer (9.5%), lymphoma and lungs cancer (6.9%), mouth (4.8%), bone cancer (3.0%) and brain tumors (8.8%) were noted. 31.4% Respondents have malignant stage-Ⅰ cancer while 21.7% of the respondents didn't know their cancer stage. Merely 1.2% of patients were being treated for metastatic (stage Ⅳ) disease. 33.5% Participants were diagnosed with cancer in 5-8 months. 72.7% Of the population were non-smokers whereas 20.8% were smokers. The detailed demographic profile of the respondents is presented in Table 1.

3.2. Patients' believes regarding the effectiveness of CAM

A total of 259 (59.8%) patients were acquainted with complementary and/or alternative therapies, while 40.2% were not familiar with CAM therapy (Table 2). 49.4% Of the study population knew the various types of CAM therapies and 60.5% of them believed that CAM therapies are safe owing the natural ingredients. 48.5% Participants used CAM for the treatment of various diseases, and 40.9% of the population used CAM therapy for the treatment of cancer. In addition, 52.2% of the participants used CAM therapy to manage the symptoms associated with cancer rather than as a primary treatment for cancer. Merely 38.8% of the respondents considered that CAM therapy is better than conventional medicines. Nonetheless, a vast population (61.2%) didn't cogitate that CAM therapies are virtuous for the treatment of cancer rather than conventional medicines. According to the present study, 42.7% of respondents seemed to be satisfied when CAM therapies integrate with conventional treatment. Consequently, 68.4% of the

Table 3. Source of information regarding complementary and alternative medicine therapy [*n* (%)].

Sources	CAM user (*n*=177)	Non-CAM user (*n*=256)	All (*n*=433)
Internet	40 (22.6)	87 (34)	127 (29.3)
Magazines	8 (4.5)	29 (11.3)	37 (8.5)
Newspaper	31 (17.5)	21 (8.2)	52 (12.0)
Radio	8 (4.5)	5 (2.0)	13 (3.0)
Television	11 (6.2)	6 (2.3)	17 (3.9)
All source	79 (44.6)	108 (42.2)	187 (43.2)

CAM: Complementary and alternative medicine.

study participants didn't report any side effects; only 31.6% had an unpleasant side effect. Though 52.7% of the study population pondered that concurrent use of CAM and conventional cancer treatment is not safe, 64.2% of the respondents reported that they did not receive any guidance regarding the usage of CAM therapies from health care professionals. Additionally, 60.7% of the respondents didn't disclose to inform their physicians or a pharmacist regarding the usage of CAM therapy. Primarily, the question was not raised during the consultation (46.9%). Some of the respondents (19.9%) assumed that the health care professionals didn't need to inform about the CAM use because they didn't believe in CAM therapy (15.5%). Merely 39.3% of the patients who discussed the usage of CAM therapies were encouraged by their health care personnel (24.5%). Detailed responses regarding the views of study participants are listed in Table 2.

The findings of the present study demonstrated that the use of complementary and alternative modalities in cancer patients was mostly undertaken to improve the quality of life (28.2%) due to family tradition/culture/religious beliefs (26.6%), to relieve the side-effects of conventional medicine (18.1%), to increase the chance of cure (11.9%), to strengthen the immune system (6.8%), and to improve the psychological well-being and sleep pattern (2.8%); whereas 5.6% of the study participants supposed that the conventional treatment was expensive (P>0.05). Consequently, 50.0% of the study population was not aware of CAM use for cancer treatment. Whereas 20.3% didn't consider it a treatment option for cancer and 20.7% didn't use CAM therapy for the treatment of cancer due to doctors prohibited them.

3.3. Different types of CAM

The results indicated that the respondents preferred to use diet/food therapy (28.8%), herbal therapy (27.7%), and prayer (10.7%). Some other CAM therapies such as massage & physiotherapy (9.6%), yoga and exercises (7.3%), religious therapy (Prayer/Zamzam water) (6.8%), mind-body therapies (5.1%), acupuncture (2.3%), and aromatherapy (1.7%) were used less frequently among the participants. Out of the 6 alternative modalities presented to respondents in the questionnaire survey, Tibb-e-Nabavi medicines were the most frequently followed (35.0%). Other alternative medicines, namely, herbal medicine and remedies (29.4%), dietary supplements (13.0%), homeopathic medicine (17.5%), Ayurvedic medicine (2.3%), and Traditional Chinese Medicine (2.8%) were less frequently recorded among the cancer patients. It has been noted that the frequency of CAM usage among CAM users was mostly (27.1%) thrice a day. The herbal medicines and functional food used by the respondents are citrus fruit (24%.0), black seeds (kalongi; 19.2%), garlic (16.9%), turmeric (13.0%), olive oil (10.7%), carrots (5.1%), ginger (5.6%), pomegranate (5.1%), and aloe vera (1.7%).

3.4. Source of information regarding CAM

The majority of the respondent used CAM therapy due to the recommendations of their family/friends/colleagues (48.0%), nutritionists (33.9%), general practitioners (14.1%), pharmacists (2.3%), and oncologists (1.7%). 43.2% of the respondents get the information regarding the usage of CAM therapy from electronic as well as from the print media. The results are listed in Table 3.

4. Discussion

It is now well-documented that the prevalence of cancer has been continuously increasing throughout the world, and its management seems to be challenging[2]. Around 9%-88% of the cancer patients used CAM[4]. This cross-sectional study was conducted regarding the usage of CAM therapy among cancer patients who lived in Karachi, Pakistan. It was noted that the consumption of CAM therapies was significantly associated with the nature of disease either cancer or tumour (P=0.013), type of cancer (P<0.001), time since diagnosis (P=0.003), family history (P=0.001), and receiving conventional treatment (P=0.001). This is in accordance with the previously reported studies[7].

The findings of the present study indicated that the usage of CAM was common among cancer patients. Even though the prevalence of CAM use among cancer patients receiving chemotherapy was 50.8% while patients experiencing radiotherapy and chemotherapy

were 20.9%. Subsequently, the percentage of CAM user undergoing surgery was found to be modest but quite relevant. It was similar to previously reported studies, which reported 46% in Japan was, 60% in Canada, and 75% in Saudi Arabia[5,7]. Nonetheless, a lower prevalence rate has been reported in Sweden (25%), Switzerland (16.7%), the United Kingdom (12.5%), and 4.3% Greece[11,12].

The prevalence of CAM modalities among patients with cancer could also be due to the general perception (74.6%) that CAMs are safe owing to being made from natural ingredients and didn't produce any harmful effects. According to the present study, the most frequent indication was supportive care (78.5%) rather than a curative intent. Patients were using CAM therapies for various reasons including to increase the body's ability to fight against cancer cells, strengthen the immune system, fear of surgery, to improve their physical or psychological well-being, an attempt to improve sleep and relaxation and to improve their quality of life through relieving several symptoms triggered either by cancer or conventional treatments. Several phytomedicines can minimize gastrointestinal adverse reactions including nausea, vomiting, diarrhoea, and constipation. In addition, CAM therapy may also decrease the neurological side effects in cancer patients, like dizziness, drowsiness, vertigo, fatigue, and headache[6,13].

According to the present study, most of the respondents were acquainted with complementary and/or alternative medicine and its various type. The most frequently used CAM modalities among patients were diet/food therapy and herbal medicine. The same therapies have been previously reported[3]. For instance, vitamins, minerals, herbal supplements, and green tea were most frequently used in Sweden, the USA, and the United Kingdom. In addition, Chinese herbs, propolis, and mushrooms were frequently used in Japan. Whereas in Saudi Arabia, camel milk, olive oil, and Zamzam water were most extensively used. In addition, supplication and Quran recitation were also considered a part of CAM therapy in Saudi Arabia[14,15]. Accordingly, some preferences have been described regarding the usage of alternative medicine in patients with cancer. It was noted that Tibb-e-Nabavi medicine was the most common alternative medicine followed by the respondents. It may be due to their religious beliefs and family traditions. In line with the findings of previous studies, the present study indicated that several herbal medicines and functional foods, namely, citrus fruit, black seeds, garlic, turmeric, olive oil, carrots, ginger, and pomegranate were frequently used among cancer patients. Utmost of the study participant considered CAM therapy as a part of their normal diet and used it on a daily or regular basis.

Media plays an important part in planting the ideas in people's minds. Several studies described that over 60% of individuals who used the electronic media were seeking health-related information and half of them were on CAM therapies[4]. According to the present study, electronic as well as print media were the most extensive source of information rather than health care professionals. CAM was more commonly used among patients with a high education level. Possibly a high education level permits easier access to the internet and media, and acquires information about alternative as well as conventional medicine. In several research studies, the same sources of information were reported among cancer patients[4].

Though CAM includes a wide range of therapies and several beneficial effects have been reported, but it is difficult to assess the side effects of CAM therapies. Moreover, various studies demonstrated that CAM integrated with conventional medicine displayed better outcomes in response rate, performance status, pain intensity, and fewer adverse effects rather than prescribed conventional medicine alone. Nonetheless, a higher risk of mortality and various adverse interactions between CAM and some anti-cancer drugs have been reported[4].

The findings of the present study indicated that patients' self-perception and knowledge regarding complementary and alternative therapies and herbal medicine were quite good. 60.9% of the study populations have been stated the positive effects of CAM and used to manage the symptoms associated with cancer or conventional medicine (P<0.005). Even though only 40.9% of the patients used CAM therapy for cancer treatments. Patients seemed to be satisfied with the integration of CAM therapy and conventional treatment (70.6%) and believed that CAM therapies could potentiate the efficacy of anticancer drugs. The results indicated that more than half of CAM users didn't report any side effects. Accordingly, guidelines should be designed based on authentic sources that help the patients to comprehend the risks and beneficial effects of CAM therapies. In line with findings of previous studies[4,16] around 60.7% of the patients were less likely to seek physician consultation regarding the use of CAM therapy for various reasons, including a lack of direct communication and informed dialogue in the patient-healthcare relationship, fear of disapproval or negative feedback, health care professionals didn't have enough information regarding the usage of CAM therapies. Accordingly, patients made their decisions based on informal sources such as family members, and friends/colleagues rather than a doctor. In addition, adequate knowledge and training on CAM therapies could promote a better relationship between physicians and patients, and foster a more open discussion on the use of CAMs[5].

The study determined the prevalence and types CAM modalities used by cancer patients in Karachi, Pakistan. This research adds information on the preferences and behaviors of cancer patients regarding CAM therapies, particularly within the unique cultural context of Karachi. The questionnaire used in this study includes

demographic information, educational background, socio-economic conditions, and specific details concerning CAM therapies. This comprehensive approach enables a more nuanced and profound understanding of the prevalence and distinctive characteristics associated with CAM utilization among cancer patients. The findings of this study hold significant implications for healthcare professionals, as they inform clinical practice and decision-making processes regarding CAM usage among cancer patients.

The present study has several limitations. Patients with cancer who have been diagnosed or treated within hospitals or oncological centers were only selected for the present study, while patients who refused the conventional treatment for various reasons were not included. CAMs encompass a wide range of therapies, while this study might not completely include all the patterns and types of CAM. The scientific evidence regarding the effcacy of specific herbal medicines or CAM therapies used in cancer remains inconclusive yet. Therefore, a follow-up study that includes a broader set of questions may help to better understand the attitudes of the patients regarding the CAM therapies. Even though the present research study had been conducted across several hospitals in a large, highly urbanized, and industrialized region of the city, it may not be representative of the whole population of Karachi in Pakistan. Additionally, large comparative studies are needed to draw a definitive conclusion regarding the usage of CAM therapy for particular symptoms that would be of benefit for defining the role of CAM in cancer patients and possible associated variables.

Complementary and alternative medicines are still less studied, and little is known about their potential interactions with radiation therapy, chemotherapy, and biological therapies. Owing to limited access to information, lack of conclusive scientific evidence and standardization of herbal drugs or preparations, the safety and efficacy of CAM along with conventional therapies have not been established yet. Some CAM therapies might lead to toxicity when used concomitantly with chemotherapy or radiotherapy. Multicentre studies and randomized clinical trials are needed to evaluate its effectiveness among patients with cancer during conventional treatment.

Conflict of interest statement

All authors declared no conflict of interest.

Informed consent statement

Informed consent was obtained from all subjects who involved in the study.

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Authors' contributions

Conceptualization, SI and GSP; Data curation, NI; Formal analysis, SI, MA and WI; Funding acquisition, GSP and KWG; Investigation, NI, LCM, HS and IA; Methodology, SI and SJ; Project administration, SJ, KWG, LCM and HS; Resources, MA, GSP and KWG; Software, HS; Supervision, SJ and IA; Visualization, WI and GSP; Writing-original draft, SJ; Writing-review & editing, SI, MA, WI, NI, GSP, KWG and LCM.

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