Nutr. Santé, 2022, Vol.11, N°02:85-98. DOI:10.30952/ns.11.2.4

Physiopathologie

Prevalence and characteristics of complementary and alternative medicine used by Algerian cancer patients: a cross-sectional study at Oncology Department of a Cancer Center in Batna

Prévalence et caractéristiques de médecine complémentaire et alternative utilisée par les patients algériens atteints de cancer : Etude transversale au service d'oncologie d'un centre de lutte contre le cancer à Batna

Hadjer NEI. BERIALA.[1], Soumia KESSAB.[2], Iman DRIHEM.[2], Fatiha BOUSSAKRA.[2], Mohammed T. BEN MOUSSA.[2]

[1]Department of Pharmacy, University of Mouloud Mammeri, TiziOuzou, Algeria.
[2]Department of Pharmacy, University of Batna 2, Batna, Algeria

Auteur correspondant : berialahadjer@yahoo.fr

Reçu le 10 mars 2022, Révisé le 06 décembre 2022, Accepté le 28 décembre 2022

Abstract ***Introduction.*** The use of complementary and alternative medicine (CAM) becomes more popular among cancer patients. In Algeria, the available literature on this subject is limited. ***Objective.*** The present study aimed to investigate the prevalence, type, and characteristics of CAM used by cancer patients of aCancerCenter in Batna, Algeria. ***Material and methods.*** A cross-sectional study was conducted at the Oncology Department of BatnaCancer Center. Patients were asked to complete an anonymous pretested questionnaire administered by a pharmacy intern. ***Results.*** A sample of 56 patients diagnosed with cancer participated in this study. The mean age was 52.6±12.9 years old, with a sex ratio of 0.4 (males/females). The prevalence of CAM use was 62.5% (35 patients). The most common types of CAM used were Islamic religious practices (41,9%), and biologically based treatments: herbal medicine (27.2%) [*Ephedra alata* DC. (26.8%), *Anonna muricata* L. (17.1%), *Berbers vulgaris* L. (12.2%), *Olea europea* L. (9.8 %), *Nigella sativa* L. (7.3%) were the most reported plants], and clinical nutrition (25.9%) was mostly represented in diets (66.7%), vitamins (9.7%) and minerals (9.7%). Interestingly, 5% of participants used acupuncture, which represented the only type of the CAM category named alternative medical systems. The most commonly cited reasons for using CAM was to treat cancer (64.0%) and to relieve moral pain (32.0%). Family and friends (59.2%), and other patients (30.6%) were the main sources of information about CAM. Statistics show that 71.4% of CAM users indicated that they did not tell their physician about using CAM for the following reasons: 40.0% “physician never asked thisquestion” and 320% thought, “it was not necessary to inform the physician”. The origin ofthe patient whether (form Batna or not) (p=0.015), the educational level (p=0.008), the perception about the efficacy of CAM (p=0.001), the current treat-

ment (p=0.005), and the received treatment (p=0.042) were factors associated with CAM use. ***Conclusion.*** The present study shows a high prevalence and a very low revelation of using CAM by cancer patients to their physician who should be opened about CAM discussions with their patients. Also, governmental committees should be created to develop scientific knowledge, regulations, and guidelines that ensure the proper use of CAM and its integration in the Algerian health system.

Key words: *Complementary and alternative medicine, Oncology, Cancer, Algeria, Batna*

Résumé ***Introduction.*** L'utilisation de la médecine complémentaire et alternative (MCA) devient plus populaire parmi les patients atteints de cancer. En Algérie, la littérature disponible sur ce sujet est limitée. ***Objectif.*** La présente étude vise à étudier la prévalence, le type et les caractéristiques des CAM utilisées par les patients cancéreux du Centre de cancérologie de Batna, en Algérie. ***Matériel et méthodes.*** Une étude transversale a été menée au service d'oncologie du centre de lutte contre le cancer de Batna. Les patients ont été invités à remplir un questionnaire anonyme prétesté administré par une interne en pharmacie. ***Résultats.*** Cinquante-six patients ont participé à cette étude. L'âge moyen était de 52,6±12,9 ans, avec un sex-ratio de 0,4 (hommes/femmes). La prévalence de l'utilisation des MCA était de 62,5 % (35 patients). Les types de MCA les plus utilisés étaient les pratiques religieuses islamiques (41,9%) et les traitements à base biologique : phytothérapie (27,2%) [*Ephedra alata* DC. (26,8%), *Annona muricata* L. (17,1%), *Berberis vulgaris* L. (12,2%), *Olea europea* L. (9,8%), *Nigella sativa* L. (7,3%) étaient les plantes les plus citées] et la nutrition clinique (25,9%), celle-ci était majoritairement représentée par les régimes alimentaires (66,7%), les vitamines (9,7%) et les minéraux (9,7%).Ce qui est intéressant, 5% des participants ont utilisé l'acupuncture, qui représentait le seul type de la catégorie MCA nommé systèmes médicaux alternatifs. Les raisons les plus fréquemment citées pour l'utilisation des MCA étaient le traitement du cancer (64,0%) et le soulagement de la douleur morale (32,0 %). La famille/l'entourage (59,2%), les autres patients (30,6%) étaient les principales sources d'information sur les MCA. La majorité des utilisateurs de MCA (71,0%) ont indiqué qu'ils n'avaient pas informé leur médecin de l'utilisation de MCA pour les raisons suivantes : 40 % "le médecin n'a jamais posé cette question" et 32,0 % "pensaient qu'il n'était pas nécessaire d'informer le médecin". Il s'avère que l'origine du patient (de Batna ou non) (p=0,015), le niveau d'étude (p=0,008), la perception de l'efficacité de MCA (p=0,001), le traitement actuel (p=0,005) et le traitement reçu (p=0,042) étaient des facteurs associés à l'utilisation des MCA. ***Conclusion.*** La présente étude montre une prévalence élevée et une très faible révélation de l'utilisation des MCA par les patients cancéreux à leurs médecins. Ces derniers doivent être ouverts à des discussions sur MCA avec leurs patients. En outre, des comités gouvernementaux devraient être créés pour développer des connaissances scientifiques, des réglementations et des lignes directrices garantissant le bon usage des MCA et leur intégration dans le système de santé algérien.

Mots clés: *Médecine complémentaire et alternative, Oncologie, Cancer, Algérie, Batna*

Introduction

Cancer is one of the significant health problems world-wide. According to the World Health Organization (WHO), it represents the second leading cause of death. In 2018, statistics show that 9.6 million deaths worldwide were linked directly to cancer [1]. Moreover, the International Agency for Research on Cancer in 2020 mentioned a significant increase in the number of cancer deaths (10 millions), which is in line with the increased number of new cancer patients (19.3 million new cases) [2]. Even though the development and the evolution in oncologic conventional treatments, the use of complementary and alternative medicine (CAM) have constantly increased and is still used among patients diagnosed with cancer [3-

7]. CAM was defined by the American Center for Complementary and Alternative Medicine (NCCAM) as “a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine” which could be classified into five categories: alternative medical systems, mind-body interventions, biologically based treatments, manipulative and body-based methods, and energy therapies [8].

The use of CAM has become more popular among cancer patients. A European survey conducted among 14 countries reported that CAM use ranged from 14.8% to 73.1% [7]. Similarly, African authors reported a prevalence of consuming CAM in oncologic departments between 46% and 79% [9,10]. Several factors have been identified as responsible for the CAM widespread use such as accessibility, affordability, and cultural compatibility of CAM, as well as the inadequate accessibility to modern medicines [6,11], and the idea of the natural equivalent of inoffensive despite their likely risks such as side effects, delays in conventional oncology treatments and decreased survival time [12,13].

However, in Algeria, the available literature on this subject is limited to a few ethnobotanical surveys [14, 15], and other unpublished studies, reflecting a lack of data that should be noted both nationally and regionally in Batna. Furthermore, the number of studies identified was limited to the inventory of medicinal plants used, which represent only one branch of CAM, and no study has been conducted on this approach as a whole, hence the originality of this work. Therefore, the use of CAM by cancer patients in Algeria remained an unexplored subject on many points.

The present study aimed to estimate the prevalence of the CAM use by cancer patients at the oncology department of the Batna anti-Cancer Center, Algeria. Moreover, it aimed to investigate type and characteristics of CAM used, source of information about CAM, reasons of using them, perceived benefits from the CAM use and its side effects, information of physicians about the use of CAM, and factors that determined the use of CAM.

Material and methods

Study design

A cross-sectional study design was carried out within the Oncology Department at the cancer center of Batna, in Algeria for 7 weeks from January to March 2020.

Study population

Patients included in this study were those consulting or undergoing treatment in the Oncology Department of the Batna cancer center. The inclusion criteria were 18 years or older, diagnosed with cancer, able to understand and speak Arabic, no history of cognitive diseases, nor psychiatric disorders, agree to participate by giving verbal consent. Patients in isolation, unconscious, and any other patients who were unable to complete the questionnaire were excluded.

Sampling

Patients received in the consultation room were randomly selected from an appointment register updates by nurses. After consenting to participate in the study, patients were face-to-face interviewed by a pharmacy intern.

Data collection

Data collection was carried out by an anonymous pretested questionnaire designed using available literature [9,16] modified to fit the purpose of our study. It included 33 questions divided into 4 parts: The first one investigated sociodemographic data including age, gender, marital status, educational level, household income, ethnicity, employment status, occupation, origin, and area. The second part comprised the following clinical and pharmacological data as the type of cancer based on the WHO International Classification of Diseases for Oncology [17], its stage, the received and the current cancer treatment.The third part consisted of the patient general knowledge about CAM to encourage patients and prepare them to respond to the following part. These questions explored their opinion on CAM (efficiency, side effects, drug interactions), their expectations from healthcare professionals on this subject, and investigated if they were looking forward to discuss CAM with their physicians. The last part included data about past or current use of CAM. The definition of CAM adopted in this study was the one announced by the NCCAM [18]. The patient was asked whether he had ever used CAM since his diagnosis of cancer. If the answer was negative, he chose an answer from a list of possible reasons for not using CAM. If the answer was positive, he was asked for: - Type of CAM used according to the classification of the NCCAM [18]. Patients using phytotherapy were asked to provide more details (common name of the herb, duration of use, moment, and frequency of application) as well as for dietary supplements; - Source of information about CAM used by patients; - Reasons for CAM use; - Reporting the satisfaction of

CAM, the conventional treatment, and the combination of both approaches; - Reporting the use of CAM to their physician (yes or no question); - Cost of the reported CAM.

Statistical analysis

Data analysis was performed using the statistical package for the social software (SPSS) version 22. A descriptive study was carried out for the characteristics of the whole population (sociodemographic, clinic, pharmacologic, and using or no CAM). A comparison between CAM users and non-users was carried out by a t-test for continuous variables (age), and $\chi 2$ test for qualitative and discrete variables (e.g. gender, origin, marital status, cost of CAM). These tests were considered statistically significant at $p< 0.05$.

Results

Socio-demographic, medical and clinical characteristics of participants

A sample of 56 patients was chosen randomly to participate in this study. As shown in **Table 1**, the mean age was 52.6±12.9 years, women were considerably higher than men with a sex ratio of 0.4 (males/females). More than one-half of the population was married and almost 25% of them had a university degree. Concerning origin and ethnicity, patients from Arab and Berber ethnicities had nearly close percentages with 39.3 and 37.5% respectively. About 68% of the patients were living in urban areas. However, only 28% were from Batna region. Statistics showed that 62.5% were professionally inactive, which could be attributed to the extremely high number of homemakers (53.6%). Among the 21 workers, administration, agricultural and educational, were the most common jobs (19.0% for each category). A minority of participants (19.6%) mentioned that their salary ranged from 15 000 DA to 30 000 DA monthly. Interestingly, the rate of those earning a high and low income was approximately close (39.3 and 41.1% respectively).

General informations of participants about CAM

As shown in **Table 2**, the majority of patients (80.3%) considered CAM effective. However, 41% thought that this approach could have side effects, and about half (52%) did not know whether CAM could cause drug interactions.

Table 1. Socio-demographic, clinical and pharmacological characteristics of participants

Variables		Participants n (%)
Age (years)	52.6±12.9	
	[25-35]	4 (7.1%)
	[35-45]	15 (26.8%)
	[45-55]	12 (21.4%)
	[55-65]	17 (30.4%)
	[65-75]	7 (12.5%)
	[75-85]	1 (1.8%)
Gender		
	Female	40 (71.4%)
	Male	16 (28.6%)
Education level		
	Illiterate	7 (12.5%)
	Coranic	7 (12.5%)
	school	8 (14.3%)
	Primary	11 (19.6%)
	school	9 (16.1%)
	Secondary	14 (25.0%)
	school	
	High school	
	College	
Marital status		
	Married	31 (55.3%)
	Single	9 (16.1%)
	Widowed	9 (16.1%)
	Divorced	7 (12.5%)
Ethnicity		
	Arab	22 (39.3%)
	Berber	21 (37.5%)
	Arab/berber	13 (23.2%)
Origin		
	Out of Batna	40 (71.4%)
	From Batna	16 (28.6%)
Area		
	Urban	38 (67.9%)
	Rural	15 (26.8%)
	Nomad	3 (5.3%)
Employmentstatus		
	Inactive	35 (62.5%)
	Active	21 (37.5)
Householdincome (DA/Month)		
	< 15 000	23 (41.1%)
	[15 000-	11 (19.6%)
	30 000]	22 (39.3%)
	> 30 000	

N = 56 patients.

Prevalence and types of CAM used

Among 56 participants, 35 patients (62.5%) had used at least one type of CAM **(Table3)**. Islamic religious practices (41.9%) were the most common CAM used, especially Quran reading (40.9%) and Zamzam water (36.1%), followed by biologically based treatments:

Table 1. Socio-demographic, clinical and pharmacological characteristics of participants (continued)

Variables	Participants n (%)
Type of cancer	
Breast	23 (41.0%)
Digestive organs	7 (12.5%)
Female genital organs	7 (12.5%)
Hematopoetic and reticuloendothelial system	4 (7.1%)
Lip, oral cavity and pharynx	4 (7.1%)
Male genital organs	3 (5.4%)
Thyroid and other endocrine glands	3 (5.4%)
Urinary tract	2 (3.6%)
Respiratory system and intratoracic organs	2 (3.6%)
Others	1 (1.8%)
Stage of cancer	
Stage 1: localized cancer	22 (39.3%)
Stage 2: locally advanced	12 (21.4%)
Stage 3: invasion of lymphatic organs	15 (26.8%)
Stage 4: metastasis	7 (12.5%)
Receivedtreatment	
Surgery	11 (19.6%)
Chemotherapy	18 (32.1%)
Radiation therapy	1 (1.8%)
Surgery and chemotherapy	16 (28.6%)
Surgery and chemotherapy and (hormonotherapyor radiation therapy)	10 (17.9%)
Currenttreatment	
Surgery	42 (75.0%)
Radiation therapy	1 (1.8%)
Hormonotherapy	6 (10.7%)
Radiation therapy and chemotherapy (and/ norhormonotherapy)	7 (12.5%)

Table 2. General informations of participants about CAM

Variables	Participants n(%)
Perception of CAM efficacy	
Yes	45 (80.3%)
No	8 (14.3%)
I don't know	3 (5.4%)
Perception of CAM side effects	
Yes	23 (41.0%)
No	14 (25.0%)
I don't know	19 (34.0%)
Perception of CAM-drug interactions	
Yes	21 (37.0%)
No	6 (11.0%)
I don't know	29 (52.0%)

herbal medicine (27.2%) such as *Ephedra alata* DC. (26.8%), *Anon muricata* L. (17.1%), *Berberis vulgaris* L. (12.2%),*Olea europea* L. (9.8%), *Nigella sativa* L. (7.3%), and clinical nutrition (25.9%) which was mostly represented by diets (66.7%), vitamins (9.5%), and minerals (9.5%). Interestingly, 5.0% of participants used acupuncture.

Reasons for use or avoidance of CAM

As shown in **Table 3**, the most commonly cited reason for using CAM was to treat cancer (64.0%), to relieve moral pain (32.0%), and not be satisfied with conventional therapy (4.0%). For non-CAM users, respondents were asked to suggest reasons for the ques -tion "why you did not use CAM?". The most cited ones were: "satisfied with the conventional treatment" (42.8%); "discouraged by my surrounddings" (28.6%), and "interested in CAM but haven't used it yet" (23.8%). Only one patient responded "never thought about it".

Information source about CAM and their characteristics

As shown in **Table 3**, more than half of CAM users (59.2%) indicated that family and friends were the main sources followed by other patients (30.6%), media (8.2%), and healthcare professionals (2.0%).

Asked about the moment of using CAM, participants indicated that Islamic religious practices and herbs were used during treatment greater than before undergoing it (82.0 and 78.0% *versus* 18.0 and 22.0%, respectively), as indicated in **Table 4**. However, no one had reported the use after treatment. On the other hand, clinical nutrition was used after treatment (81.0%) rather than during it (19.0%). Most users of phytotherapy and clinical nutrition did it every week (48.8%) or every day (76.2%).

The duration of using CAM depended on the CAM type. About half of clinical nutrition users reported a period of use that fluctuated between 6 and 9 months. However, the majority of herbal medicine users announced a period of 3 months or less.In response to the cost of CAM used, the monthly budget mean was 8469.7±5451,4 Dinars, and extremes from 2 000 to 30 000 Dinars (10 to 150 euros).

Perceived satisfaction from using CAM and its side effects

Despite reporting moderate satisfaction of CAM by numerous users (48.6%), over half of them thought that the satisfaction of their conventional treatment was also moderate (54.3%), as well as the satisfaction of the combination of both approaches, which was reported by 74.3% of the CAM users. Less than a quarter (20.0%) of them reported having side effects including malaise, weakness, weight loss, and digestive symptoms (diarrhea, constipation, abdominal pain, nausea, vomiting).

Table 3. Prevalence, types and characteristics of CAM use by participants

Variables		Participants n (%)
CAM use		
	Yes	3562.5%)
	No	21(37.5%)
Type of CAM		
Mind-body medicine	**Religious and spiritual healing (more than one answer):**	**34(41.9%)**
	Coran lecture	25(40.9%)
	Zamzam water	22(36.1%)
	Praying	6(9.8%)
	Hijama	7(11.5%)
	Others	1(1.7%)
Biologically-base therapies	**Herbals (more than one answer):**	**22(27.2%)**
	Ephedra alata DC., Ephedraceae	11(26.8%)
	Anon muricata L., Annonaceae	7(17.1%)
	Berberis vulgaris L., Berberidaceae	5(12.2%)
	Oleaeuropea L., Oleaceae	4(9.8%)
	Nigella sativa L., Ranunculaceae	3(7.4%)
	Curcuma longa L., Zingiberaceae	2(4.9%)
	Trigonellafoenum-graecum L., Fabaceae	2(4.9%)
	Zingiberofficinale Mill., Zingiberaceae	2(4.9%)
	Ajugareptans L., Lamiaceae	1(2.4%)
	Allium cepa L., Amaryllidaceae	1(2.4%)
	Allium sativum L., Amaryllidaceae	1(2.4%)
	Chamaemelumnobile L., Asteraceae	1(2.4%)
	Origanummajorana L., Lamiaceae	1(2.4%)
	Dietary treatment (more than one answer):	**21(25.9%)**
	Diets	14(66.7%)
	Vitamins	2(9.5%)
	Minerals	2(9.5%)
	Others	3(14.3%)
Alternative medical systems	**Acupuncture**	**4(5.0%)**
Source of information about CAM (more than one answer):		
	Family and friend	29(59,2%)
	Media	4(8,2%)
	Other patients	15(30,6%)
	Healthcareprofessionals	1(2,0%)
Reasons for using CAM (more than one answer):		
	To treat the cancer	32(64.0%)
	To relieve moral pain	16(32.0%)
	Not satisfied by the conventional therapy	2(4.0%)

Information of physicians about the use of CAM

The majority of CAM users commented that they did not inform their physician (71.4%) for the following reasons: “my physician never asked me this question” (40.0%), a significant rate (32.0%) thought, “it was not necessary to inform my physician about the use of CAM”. Less than a quarter (20.0%) responded with ”my physician will stop treating me”. Only 8.0% thought, “my physician will disapprove or discourage the use of CAM”.

Bivariate analysis

The results of the bivariate analysis established by crossing the variable of interest “use of CAM” and the socio-demographic, pharmacological, pathological characteristics showed the origin of the patient (from Batna/not from Batna) (p=0.015), the educationlevel (p=0.008), the perception of the CAM efficacy (p= 0.001), the received treatment (p=0.042) and the current treatment (p=0.005) were determinants factors associated with CAM use, as shown in **Table 5**.

Table 3. Prevalence, types and characteristics of CAM use by participants (continued)

Variables	Participants n (%)
Reasons for avoidance of CAM	
Satisfied with the conventional therapy	9(42.8%)
Never thought about it	1(4.8%)
Discouraged by my surroundings	6(28.6%)
Interested in CAM but have not use it yet	5(23.8%)
Satisfaction with CAM	
Not satisfied	4(11.4%)
Moderately satisfied	17(48.6%)
Very satisfied	14(40.0%)
Satisfaction with conventional treatment	
Not satisfied	9(25.7%)
Moderately satisfied	19(54.3%)
Very satisfied	7(20.0%)
Satisfaction with both approaches	
Not satisfied	2(5.7%)
Moderately satisfied	26(74.3%)
Very satisfied	7(20.0%)
Side effects of CAM	
Yes	7(20.0%)
No	28(80.0%)
Information of physicians about the use of CAM	
Yes	10(28.6%)
No	25(71.4%)
Reasons for not informing physicians about using CAM	
My physician never asked me this question	10(40.0%)
My physician will disapprove or discourage the use of CAM	2(8.0%)
It was not necessary to inform my physician	8(32.0%)
My physician will stop treating me	5(20.0%)
Cost of CAM (DA/month) 8 469.7±5 451.4	
< 5 000	6 (17.1%)
[5 000 - 10 000]	17 (48.6%)
[10 000 – 15 000]	9 (25.7%)
≥ 15 000	3 (8.6%)

Discussion

To our knowledge, this was the first study on the CAM use among cancer patients, realized in the OncologyDepartment at the cancer centre of Batna (Algeria), using a questionnaire. Answers from 56 patients were analyzed and interpreted carefully. Interestingly, 62.5% of cancer patients used CAM. Islamic religious practices and herbal medicine were the major common type of CAM used (41.9 and 27.2 %, respectively). Family and friends were the principal sources of information about CAM (59.2%), followed by other patients (30.6%). The most commonly cited reason for using CAM was to treat cancer (64.0%). Another important finding was that 71.0% of CAM users did not inform their physicians. The origin of patients, their education level, their perception of CAM efficiency, and their received and current treatment were the significant factors associated with the CAM use among our sample. The prevalence of CAM use in our study was 62.5%. This rate was higher than that reported by a Moroccan study conducted by Brahmi *et al.,* (46%) [9] which could be an overestimation related to the small sample size in our study. African neighbors in Ethiopia [10] and Ghana [19] reported a higher rate of CAM use (79% and 73.5% respectively). On the other hand, a survey among 14 European countries reported a CAM use ranged between 14.8% and 73.1%. This widespread use ought to be related to the fact that CAM was more supported by European governments or more integrated in their health care system [7]. Until now, there is no theoretical model that could explain the employment of alternative forms of health care. It might be related to the need of patients with chronic diseases, such as cancer for autonomy, their dissatis-

Table 4. Moment, frequency and duration of using CAM by participants

Variables	Participants n (%)		
	Mind-body medicine	Biologically based therapies : herbals	Biologically based therapies: dietary treatments
Moment of using			
Before treatment	6(17.6%)	9(21.9%)	0
During treatment	28(82.4%)	32(78.1%)	7(19.5%)
After treatment	0	0	29(80.5%)
Frequency of using			
Everyday	36 (53.7%)	19(46.3%)	22(61.1%)
Every week	5(7.5%)	20(48.8%)	9(25%)
Every month	13(19;4%)	2(4.9%)	2(5. 6%)
Occasionally	13(19;4%)	0	3(8.3%)
Duration of use			
< 3 months	/	18(43.9%)	5(14.2%)
3 months	/	10(24.4%)	7(19.0%)
6 months	/	9(22%)	12(33.0%)
9 months	/	3(7.3%)	9(23.8%)
≥ 1 year	/	1(2.4%)	3(10.0%)

Table 5. Bivariate analysis of CAM use with socio-demographic, clinical and pharmacological characteristics

Variables	CAM users n(%)	CAM no-users n(%)	*P*-value
Age (years)	50.5 ±13.6	56.1 ±11.1	0.121
Gender			
Female	28 (80.0%)	12(57.1%)	0.67
Male	7 (20.0%)	9(42.9%)	
Educational level			
Illiterate	2 (5.7%)	5(23.8%)	0.008
Coranic school	6 (17.1%)	1(4.8%)	
Primary school	3 (8.6%)	5(23.8%)	
Secondary school	10 (28.5%)	1(4.8%)	
High school	3 (8.6%)	6(28.5%)	
College	11 (31.5%)	3(14.3%)	
Marital status			
Married	18 (52.0%)	13(61.9%)	0.727
Single	6 (17.0%)	3(14.3%)	
Widowed	7 (20.0%)	2(9.5%)	
Divorced	4 (11.0%)	3(14.3%)	
Ethnicity			
Arab	15 (42.8%)	7(33.3%)	0.179
Berber	10 (28.6%)	11(52.4%)	
Arab/berber	10 (28.6%)	3(14.3%)	
Origin			
Out of Batna	21 (60.0%)	19(90.5%)	0.015
From Batna	14 (40.0%)	2(9.5%)	
Area			
Urban	7 (20.0%)	8(38.1%)	0.334
Rural	26 (74.3%)	12(57.1%)	
Nomad	2 (5.7%)	1(4.8%)	
Employment status			
Inactive	23 (65.7%)	12(57. 1%)	0.631
Active	12(34.3%)	9(42.9%)	
Household income (DA/Month)			
< 15 000	15 (42,9%)	8(38.1%)	0.826
[15 000-30 000]	6 (17.1%)	5(23.8%)	
≥ 30 000	14 (40,0%)	8(38.1%)	
Type of cancer			
Breast cancer	14 (60.9%)	9(39.1%)	0.833
others	21 (63.6%)	12(36.4%)	

Table 5. Bivariate analysis of CAM use with socio-demographic, clinical and pharmacological characteristics (continued)

Variables	CAM users n(%)	CAM no-users n(%)	*P*-value
Stage of cancer			
Stage 1: localized cancer	12 (34.3%)	10(47.6%)	0.315
Stage 2: locally advanced	9 (25.7%)	3(14.3%)	
Stage 3: invasion of lymphatic organs	8 (22.6%)	7(33.3%)	
Stage 4: metastasis	6 (17.1%)	1(4.8%)	
Received treatment			
Monotherapy	18 (78.3%)	5(21.7%)	0.042
Association	17 (51.5%)	16(48.5%)	
Current treatment			
Monotherapy	34 (97.1%)	15 (71.4%)	0.005
Association	1 (2.9%)	6 (28.6%)	
Perception of CAM efficacy			
Yes	33(94.3%)	12(57.1%)	0.001
No	0	8(38.1%)	
I don't know	2(5.7%)	1(4.8%)	
Perception of CAM side effects			
Yes	12(34.3%)	11(52.4%)	0.405
No	10(28.6%)	4(19.0%)	
I don't know	13(37.1%)	6(28.6%)	
Perception of CAM-drug interactions			
Yes	13(37.1%)	8(38.1%)	0.522
No	5(14.3%)	1(4.8%)	
I don't know	17(48.6%)	12(57.1%)	

tisfaction with chemical treat-ment, their cultural background, and their spiritual or religious beliefs [20].

Our results showed that mind-body interventions (41.9% for Islamic religious practices) were the most common CAM used, followed by biologically based treatments (27.2% for herbs and 25.9% for clinical nutrition such as diets, vitamins, and minerals), and alternative medical systems (5% of participants were used acupuncture). These findings are similar to other data which mentioned the same CAM-used categories [9, 10,16,19,21].

The high use of Islamic religious practices and herbs in our population might be related to their beliefs regarding Islam, which represents the official religion in Algeria, and the influence of customs, where people tended to consult first an herbalist or traditionnal healers before visiting a doctor.

However, it is interesting to note that our survey did not reveal other CAM categories mentioned by the NCCAM classification and reported by other authors, like homeopathy, aromatherapy, massage, energy healing. It might be related to the access lack to these treatments in Algeria, compared to developing countries, where the government invested in CAM by integrating it into the healthcare system and insurance services. Consequently, patients spend more on CAM than on all hospitalization therapies [22]. Another possible explanation was the lack of physicians information about these treatments and the preconceived knowledge about their effectiveness. In this study, CAM users indicated that Islamic religious practices and herbs were mostly used during treatment, but clinical nutrition was used after (81.0%) rather than through the treatment (19.0%). These results differed from some studies in which the use moment was referred to before and after cancer diagnosis [9,23]. On the other hand, most users of phytotherapy did so frequently every week (48.8%) and every day (46.3%). Furthermore, 76.2% of clinical nutrition usersdid it every day. Nevertheless, nostudy had discussed this point.These findings highlighted the belief of patients in theharmless of CAM resumed in the concept of being natural so inoffensive.

Regarding the CAM practice duration, this study indicated that most clinical nutrition users reported a use period varying between 6 and 9 months. In addition, the majority of patients used herbal medicine for less than 3 months. This finding supported previous data that showed a CAM use duration < 1 year

for 83.8% of the users [23]. The majority of our CAM users thought that thisapproach was effective and could not have side effects. However, they did not know whether CAM could occur in drug interactions. These results marched with those observed in a study conducted at the University-Based Oncology Center in Germany where the majority of users (72.0%) thought that using CAM could not induce any side effects neither hurt their current cancer treatment (77.0%) [24]. However, a previous Moroccan survey reported that although 50.0% of users believed that complementary medicine could have side effects, 43% of them believed that there were no interactions between the two treatments [9].

This general perception that herbal remedies or drugs are very safe and devoid of adverse effects or drug interaction might be because CAM was classified among food and dietary supplement, with less or controlled quality and available in herbalists or practiced by traditional health practitioners that might not be certified or licensed [25].

In our study, the most commonly cited reason for using CAM was to treat cancer and to relieve moral pain. These concepts partially agree with the findings of Brahmi *et al*., [9] and Yarney *et al*., [19] conducted in Africa and those realized in Europe [26-28], and Asia [29]. This might be related to the strong belief in CAM, as confirmed by Verhoef *et al.,* [30], to the fact that the disease-related symptoms are not easily addressed by conventional treatment [3], also to their need to reduce the psychological distress symptom [31]. However, other reasons for using CAM had been mentioned, such as improving the immune system [7,21,24,28,29], reducing toxicity and side effects of conventional treatment [7,10,16,24,28], trying anything that can help [7,9,10,16,24], treating psychological distress [19,21,26], dissatisfaction with the conventional therapy [10,19]. A systematic review confirmed that reasons for CAM use varied widely. Nevertheless, the type of cancer and study design (including sample size and geographic region) did not appear to be related to reasons for CAM use [30].

The most cited reason for not using CAM among our population was satisfaction with conventional treatment, which was supported by numerous findings [7,19,27,28,32]. Moreover, the reason for discouraging by surroundings has been extensively reported by previous literature [7,9,10,19,27,29,32] as claimed by our non-CAM users. These might be due to a negative experience with the use of CAM. Nevertheless, only one study [7] indicated that patients avoided using CAM because “they interested in CAM but haven't used it yet” as well as mentioned in our findings. This might reflect an interesting percenttage of CAM users as describe Yarney *et al*., [19] and it could be due to the encouragement of other patients on this subpopulation. Particular attention should be taken to this category, to disclose the internal and external predictors that made their intention to use CAM. A diversity of other reasons claimed by CAM non-users has been reported in previousstudies. For example, they didn’t know or never thought about CAM [7,19,28,29,32], not interested in CAM [24,27,28], lack of reliable information about CAM [7,24,27,32], economy or financial reasons [7,28, 29,32], and the afraid of side effects or interference with their treatment [10,28].

Our results indicated that family and friends were the main source of information about CAM followed by other patients, media, and healthcare professionals. The findings of the current study are consistent with those of an Ethiopian survey indicating that the most commonly cited source of information about CAM was families, relatives, and friends (46.1%) followed by other cancer patients using CAM (38.3%) [10]. Brahmi *et al.*, found that the main information source for complementary medicine was patients family and friends (65% of patients), the traditional healer (17.0%) and the media (8.0%) [9]. These findings were not surprising since the average age of our population was 52.6±12.9 years and three-quarter had an education level lower than a university degree which could be responsible for the difficulty ofusing or understanding media tools. Another possible explanation was that health care professionals did not know about CAM or they had noticed a lack of scientific information making them unable to recommend it to their patients. On the other hand, they could also do not trust in the safety of CAM. The adverse effects from complementary products and herbs due to their contamination-toxicity, interacttions with conventional cancer treatment might made physicians anticipated a negative opinion and prohibited the use of them by their patients [33].

In contrast to earlier findings, some studies indicated that media, health personnel, andown volition were the main sources of CAM use recommendation [7,16, 19,23,24,26,27].

The majority of our patients seemed moderately satisfied with CAM, of their conventional treatment as well as of the combination of both approaches. These findings are in line with those of Brahmi *et al*., reporting that patients tended to be satisfied by the CAM use, with a mean satisfaction score of 6.5 (a score of 10 indicated the highest level of satisfaction)

[9]. In addition, Molassiotis *et al.,* indicated that patients tended to be satisfied by the CAM use with a mean satisfaction score of 5.2±1.5 (a score of 7 indicated the highly satisfying level) [7]. Moreover, Asfaw Erku estimated that 40.9% of cancer patients had average satisfaction with their CAM use [10].

In our study, seven patients reported having side effects of using CAM including malaise, weakness, weight loss, and digestive symptoms (diarrhea, constipation, abdominal pain, nausea, vomiting). Our findings were consistent with those reported by previous studies, in which gastrointestinal symptoms [7,10,19,23,27,32], and fatigue [10,32] were also observed. Despite no statistically significant association between these side effects and CAM use, had been mentioned by studies above, many reports approved the potential of CAM to induce adverse effects both in direct and indirect paths due to CAM-drug interaction, which should be considered at least theoretically [3,13,28,34].

We found that the majority of CAM users did not inform their health care professionals. This is in accord with the results of Chang *et al.,* [28] and Abuelgasim et *al.,* [29] who estimated respectively 72.2% and 70% of non-disclosure from CAM users to their physicians. In general, the reported percentage of patients informing CAM use to their physician ranged from 16.6-79.2% [10,26,28,32]. In accordance with the present results, previous studies have demonstrated that three major reasons made patients did not communicate using CAM with their medical stuff: nobody asked me [9,27,32], it was not necessary to inform them [10,28] and expectation of misunderstanding, negative attitude or response from them toward using CAM [10,27,32]. The deficiency in mutual communication about CAM use could be attributed to the direct and indirect risk of consuming CAM as well as the scientific evidence lack concerning the effect of complementary therapies and to the differences in treatment philosophy among CAM providers potentially [33]. Furthermore, a systematic review showed that the CAM type used, patient and doctor characteristics were linked to higher rates of CAM use disclosure [35].

In our study, the cost of CAM used ranged from 2 000 to 30 000 Dinars per month (10 to 150 Euros per month), was higher than that reported in other countries. Indeed, in Morocco, Brahmi *et al*., reported a monthly budget of CAM, with extremes from 0 to 30 Euros [9]. A Swedish study carried out in 2019 indicated that more than half of the patients reported spending ≤ 50 Euros monthly [32]. In a survey among 14 European countries released in 2005, patients was spending an average of 123 Euros/month [7]. This decrease in CAM costs among these countries can be explained, in part by the growth of the CAM market, especially of medicinal herbs where CAM represents a considerable industry [25,36]. Also, the existence of fully (in a few countries, such as China, Korea, and Vietnam) or partially (in most countries like the United Kingdom, Japan, Germany, Australia, the United States) insurance coverage in the high-income countries could be attributed to decrease the CAM cost [22].

In our study, the patients origin whether they were form Batna or not (p=0.015), their education level (p =0.008), their perception about the CAM efficacy (p= 0.001), their current (p=0.005), and received treatment (p=0.042), were associated with CAM use. Education levels seemed to be more frequently cited by authors [7,10,23,27,32] as predictors of CAM use. Surprisingly, the three other factors have not previously been described. Nevertheless, this study has been unable to demonstrate association between using CAM and other factors reported by literature; age [7,23,26-28,32], gender [7,23,27,29], household income [7,10,27], employment status [29], presence of comorbidity [10], previous use of conventional treatments [26], cancer stage [10].

Our survey contributed to enrich data, particularly Algerian one, on the subject of the CAMuse by cancer patients. It might be useful for future quantitative survey research by providing an approximate estimation for the sample calculation. Moreover, it has significant implications for both patients and health care professionals by highlighting the widespread use of CAM among patients with cancer, and the effectiveness necessity of patient-physician communication to protect users from unnecessary and unproven CAM therapies. The study has some limitations that should be considered. These included its cross-sectional design, the relatively small sample size and duration of the study related to the widespread coronavirus 2019 pandemic which limited the mobility of investigators. Finally, future studies in this patient population should be conducted with longitudinal study designs with larger samples to yield more results that are generalizable.

Conclusion

Our results demonstrate a high prevalence of CAM use among the participants. The main reason for consuming CAM is to treat the disease. The most used CAM types are Islamic religious practices, and herbal medicine. Family and friends, and other

patients are the main sources of information about CAM. The most commonly cited reasons for using CAMare to treat cancer, and to relieve moral pain. Nearly half of CAM users are reported a moderate satisfaction about using this approach. Side effects cited by CAM users are malaise, weakness, weight loss, and digestive symptoms. The majority of them do not inform their doctor, frequently because the doctor do not discuss the subject. The origin of the patient,theeducation level,the perception of the CAM efficacy, the received and the current treatment are the determinants factors associated with CAM use. These findings suggest several recommendations for the Algerian government, which must take a greater interest in CAM therapies on several sides. Legally, by integrating CAM in health products, which stopped considering herbs and supplements among aliments and buying them by uncertified and unqualified people without any control. Scientifically, by the incorporation of CAM education into the undergraduate medical curriculum and integrating it as a treatment approach in the health medical system which improved health care professionals knowledge on CAM, thereby improving doctor-patient communication. Interestingly, in its document strategy, the WHO has initiated policies, regulations, and guidelinespromoting the implementation of CAM among the member states across the world [37].

Conflict of interests

The authors declare that they have no conflict of interests.

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