Original Article

Use of Alternative and Complementary Medicines by Cancer Patients at the Yaoundé General Hospital, Cameroon

Utilisation des Médecines Alternatives et Complémentaires par les Patients Cancéreux à l'Hôpital Général de Yaoundé, Cameroun

Ondoua Nguele[1,2], Berthe Esson Mapoko[3,4], Célestine Dassaou[5,6], Jeanne Mbole Mvondo[5], Etienne Obalemba Atenguena[3,6], Stéphane Zingue[7], Emmanuel Nnanga Nga[5]

Affiliations
1. Department of Pharmacology and Traditional Medicine, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Cameroon
2. Yaoundé Jamot Hospital, Cameroon
3. Department Internal Medicine, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Cameroon
4. Yaoundé Central Hospital, Cameroon
5. Department of Galenic Pharmacy and Pharmaceutical Legislation, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Cameroon
6. Yaoundé General Hospital
7. Department of Pharmacokinetics and Pharmacotoxicology, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Cameroon

Corresponding author
Dr Ondoua Nguele. Department of Pharmacology and Traditional Medicine, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Cameroon
Telephone: (+237) 699 350 285
E-mail: marc.ondoua@fmsb-uy1.cm

Keywords: alternative and complementary medicine, breast cancer, CA 15-3, Yaoundé General Hospital, Oncology
Mots-clés : médecine alternative et complémentaire, Cancer du sein, CA 15-3, Hôpital Général de Yaoundé, Oncologie

Article history
Submitted: 7 January 2025
Revisions requested: 6 February 2025
Accepted: 20 February 2025
Published: 27 February 2025

ABSTRACT

Introduction. In Sub-Saharan Africa (SSA), breast cancer has a prevalence of 54.5% and patients face difficulties in accessing healthcare facilities and medications. This study evaluated the prevalence, types, factors associated with complementary and alternative medicine (CAM) use among breast cancer patients. **Materials and methods.** This prospective cross-sectional descriptive study was conducted in the Oncology department of the Yaoundé General Hospital. A semi-structured survey was administered to breast cancer patients to collect sociodemographic, clinical, and therapeutic information, along with data on CAM use. Recent CA 15-3 data were extracted from patients' medical records and compared with measurements obtained during the study. **Results.** One hundred and forty-eight patients were recruited, with an average age of 47.7 ± 10.73 years; the age range of 44 to 54 years (35.81%) was the most represented. Invasive ductal carcinoma (62.16%) was the predominant histological type, chemotherapy was the most common treatment (58.09%), and adverse effects were reported by 68.91% (102/148) of participants. The prevalence of CAM use was 61.48% (91/148), represented by medicinal plants such as *Hibiscus sabdariffa* (12.03%), *Annona muricata* (9.77%), and *Gnetum africanum* (9.4%). CAM use was correlated with professional status (p=0.04), chemotherapy (p=0.03), and the occurrence of adverse effects (p=0.0002). A non-significant decrease of CA 15-3 level was observed. **Conclusion.** More than half of the participants used CAM, primarily based on medicinal plants. The combination of CAM and conventional medicine could improve the quality of life for patients with breast cancer.

RÉSUMÉ

Introduction. En Afrique sub-saharienne la prévalence du cancer du sein est de 54,5%, et les patientes ont des difficultés à accéder aux soins de santé. Ce travail a évalué la prévalence, les types, les facteurs associés à l'utilisation des médecines alternatives et complémentaires (MAC). **Méthodes.** Cette étude descriptive transversale prospective a été menée au service d'Oncologie de l'Hôpital Général de Yaoundé. Elle a concerné les patientes atteintes du cancer du sein dont les informations sociodémographiques, cliniques, thérapeutiques et celles liées à l'utilisation de la MAC ont été collectées. Les données récentes du CA 15-3 des participantes ont été extraites des dossiers médicaux, et mesurées expérimentalement pendant l'étude. **Résultats.** Cent quarante-huit patientes ont été recrutées dont l'âge moyen était de $47,7 \pm 10,73$ ans, l'intervalle de 44 à 54 (35,81%) était le plus représenté. Le carcinome canalaire infiltrant (62,16%) était le type histologique majoritaire, la chimiothérapie le traitement le plus utilisé (58,09%) et les effets indésirables ont concerné 68,91% (102/148) participantes. La prévalence d'utilisation de la MAC était de 61,48% (91/148) avec *Hibiscus sabdariffa* (12,03%), *Annona muricata* (9,77%) et *Gnetum africanum* (9,4%). L'utilisation de la MAC était corrélée au statut professionnel (p=0.04), à la chimiothérapie (p=0.03) et la survenue d'effets indésirables (p=0.0002). Une diminution non-significative du CA 15-3 a été observée. **Conclusion.** Plus de la moitié des patientes utilisent la MAC à l'Hôpital Général de Yaoundé, principalement à base de plantes médicinales. L'association de la MAC et la médecine conventionnelle est une piste à explorer pouvant améliorer la qualité de vie des patientes.

HIGHLIGHTS

What is already known on this topic
In Sub-Saharan Africa (SSA), breast cancer has a prevalence of 54.5% and patients face difficulties in accessing healthcare facilities and medications. This study evaluated the prevalence, types, factors associated with complementary and alternative medicine (CAM) use among breast cancer patients

What question this study addressed
The use of CAM in breast cancer patients was investigated in this study.

What this study adds to our knowledge
The prevalence of CAM use was 61.48% (91/148), represented by medicinal plants such as Hibiscus sabdariffa (12.03%), Annona muricata (9.77%), and Gnetum africanum (9.4%). CAM use was correlated with professional status (p=0.04), chemotherapy (p=0.03), and the occurrence of adverse effects (p=0.0002). A non-significant decrease of CA 15-3 level was observed

How this is relevant to practice, policy or further research
The combination of certain CAM with a conventional drug can favorably improve the treatment of breast cancer and remains a path to explore.

INTRODUCTION

Breast cancer is the most common malignant tumor in women worldwide [1]. In 2022, nearly 3 million cases were recorded, and more than 600,000 people died from it globally, with a prevalence of 54.5% in SSA [2, 3]. Although this rate is low compared to the rest of the world, the incidence of breast cancer in SSA could double by 2050, while its mortality remains the highest [4-7]. It is the most diagnosed cancer in Cameroon, with 4,207 cases and 2,285 deaths reported in 2022 [8, 9]. Beyond the disease, patients face difficulties in accessing healthcare facilities and services, as well as challenges related to the cost and availability of medications, the side effects of chemotherapy, and therapeutic failures [8, 10, 11]. As a result, these patients seek and explore CAM to improve their health condition [12-14].

CAM is defined as the sum of knowledge, skills, and practices based on the theories, beliefs, and traditional experiences of various cultures, whether explainable or not, used for maintaining health as well as for the prevention, diagnosis, improvement, or treatment of physical and mental illnesses [15, 16]. Numerous studies have demonstrated both *in vitro* and *in vivo* the cytotoxic and antitumor activities of several CAMs [17], and patients have reported satisfaction after their use [14, 18]. Furthermore, synergistic effects and potentiation have been observed when combining CAM with conventional treatment [19-21]. Subject to the demonstration of their effects in clinical settings, CAMs could serve as an ideal alternative in the socioeconomic context of SSA. In Cameroon, data on the use of CAM in Oncology are scarce; Afungchwi et *al.* [22] described its use in pediatrics. This study focused on the use of CAM among patients with breast cancer, examining the prevalence of CAM use, the types used, the reasons for their use, and their impact on improving the quality of life of the patients.

MATERIALS AND METHODS

Ethical considerations
This study was approved by the Institutional Ethical Review Board of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I (N°1128/UY1/FMSB/VDRC/DAASR/CSD), and the General Management Department of the General Yaoundé Hospital (N/Ref. :168-24 /HGY/DG/DPM/APM-TR).

Study design
It was a prospective cross-sectional descriptive study conducted in the Oncology department of the Yaoundé General Hospital (YGH) from March to June 2024. YGH is one of the most specialized cancer treatment hospitals in Cameroon. It has numerous departments specializing in cancer treatment, including medical Oncology, pathological anatomy, gynecology, and surgery.

Data collection tool
The questionnaire (semi-structured survey) was developed based on Ezeome et *al.* study [23].

Participants
Patients were approached in the waiting room before the consultation in some cases, and after for others. The informed consent forms were separated from the questionnaire to maintain anonymity, and the data collected during the pre-test were not included in the study. The study involved breast cancer patients regardless of their social class, origins, or stage of the disease, who spoke French or English. Recruitment was conducted in a consecutive and non-exhaustive manner. The study was explained to them through the information notice, and those who agreed to participate in the study subsequently reviewed and signed the informed consent form.

Bias
All patients suffering from breast cancer and attending consultations at the oncology department were included in the study. The questionnaire was written in a simplified manner and tested on a sample of 20 patients by two nurses from the department who were trained for this purpose.

Variables
Data collected and analyzed included: sociodemographic characteristics (age, education level, religion, marital status, professional status and origin area); clinical characteristics (breast cancer histological type, type of treatment, chemotherapy adverse effects); CAMs characteristics (used CAM, reasons for using CAM, CAM adverse effects) and participants CA 15-3 level.

The most recent value of tumor antigen CA 15-3 prior to the survey were obtained from their medical records. At the end of the encounter, the participants were oriented towards the laboratory of the YGH for a blood sample collection and analysis. A plasma sample was collected by the laboratory technicians and analyzed according to the manufacturer's recommendations using the CA 15-3 ELISA kit (RE54141).

Data analysis
The data were transcribed onto Microsoft Excel 2016 and analyzed using GraphPad Prism 8.0.2 software. Results were presented in contingency tables in terms of count and

frequency (categorical data), mean ± standard deviation/standard error of the mean, and figures (quantitative data). Chi-square test was performed to determine the association between clinical and therapeutic sociodemographic variables and CAM consumption. Significance level was set at $p<0.05$.

RESULTS

Table I: participants sociodemographic characteristics

Variable	n (%)	CAM+	CAM-	P-value
Age				
22-32	9 (6.08%)	6 (6.82%)	3 (5%)	0.939
33-43	44 (29.73%)	27 (30.68%)	17 (28.33%)	
44-54	53 (35.81%)	31 (35.23%)	22 (36.67%)	
55-65	35 (23.65%)	22 (25%)	13 (21.67%)	
>65	7 (4.73%)	5 (5.68%)	2 (3.33%)	
Education level				
None	2 (1.35%)	1 (1.1%)	1 (1.75%)	0.4177
Primary	33 (22.30%)	20 (21.98%)	13 (22.81%)	
Secondary	60 (40.54%)	35 (38.46%)	25 (43.86%)	
Superior	49 (33.11%)	34 (37.36%)	15 (26.32%)	
Absent	4 (2.70%)	1 (1.1%)	3 (5.26%)	
Matrimonial status				
Single	46 (31.08%)	30 (32.97%)	16 (28.07%)	0.1243
Concubinage	2 (1.35%)	2 (2.2%)	0 (0%)	
Divorced	2 (1.35%)	0 (0%)	2 (3.51%)	
Married	87 (58.78%)	50 (54.95%)	37 (64.91%)	
Widow	11 (7.43%)	9 (9.89%)	2 (3.51%)	
Professional status				
Without incomes	33 (22.3%)	20 (21.98%)	13 (22.81%)	0.0413
Without fixed incomes	40 (27.03%)	25 (27.47%)	15 (26.32%)	
With fixed incomes	54 (36.49%)	36 (39.56%)	18 (31.58%)	
Retired	5 (3.38%)	5 (5.49%)	0 (0%)	
Absent	16 (10.81%)	5 (5.49%)	11 (19.3%)	
Origin				
Adamaoua	1 (0.68%)	0 (0%)	1 (1.75%)	0.4457
Centre	45 (30.41%)	28 (30.77%)	17 (29.82%)	
East	4 (2.7%)	3 (3.30%)	1 (1.75%)	
Littoral	7 (4.73%)	3 (3.30%)	4 (7.02%)	
North	1 (0.68%)	1 (1.10%)	0 (0%)	
North-west	2 (1.35%)	1 (1.10%)	1 (1.75%)	
West	67 (45.27%)	45 (49.45%)	22 (38.6%)	
South	8 (5.41%)	3 (3.3%)	5 (8.77%)	
South-West	9 (6.08%)	6 (6.59%)	3 (5.26%)	
Foreign	2 (1.35%)	1 (1.10%)	1 (1.75%)	
Absent	2 (1.35%)	0 (0%)	2 (3.51%)	

CAM+: CAM user; CAM-: non-CAM user. One hundred and forty-eight participants were recruited, with an average age of 47.7 ± 10.73 years, and the age group of 44 to 54 was the most represented.

Table II: participants clinical and therapeutic characteristics

Variable	n (%)	CAM+	CAM-	P-value
Breast cancer histological type				
Metaplastic carcinoma	1 (0.68%)	0 (0%)	1 (1.75%)	0.0752
Mucinous carcinoma	1 (0.68%)	1 (1.1%)	0 (0%)	
Tubular carcinoma	1 (0.68%)	1 (1.1%)	0 (0%)	
IDC	92 (62.16%)	65 (71.43%)	27 (47.37%)	
IDC + DCIS	1 (0.68%)	1 (1.1%)	0 (0%)	
NSIC	3 (2.03%)	2 (2.2%)	1 (1.75%)	
DCIS intermediar level	1 (0.68%)	0 (0%)	1 (1.75%)	
DCIS high level	1 (0.68%)	0 (0%)	1 (1.75%)	
ILC	4 (2.70%)	2 (2.2%)	2 (3.51%)	
Absent	43 (29.05%)	19 (20.88%)	24 (42.11%)	
Treatement				
Surgery	52 (21.58%)	29 (19.59%)	23 (23.47%)	0.0339
Chemotherapy	140 (58.09%)	86 (58.11%)	54 (55.1%)	
Hormonotherapy	13 (5.39%)	11 (7.43%)	2 (2.04%)	

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Targeted therapy	11 (4.56%)	10 (6.76%)	1 (1.02%)	
Immunotherapy	2 (0.83%)	2 (1.35%)	0 (0%)	
Radiotherapy	23 (9.54%)	10 (6.76%)	13 (13.27%)	
Adverse manifestations				
Yes	102 (68.91%)	72 (79.12%)	30 (52.63%)	0.0002
No	30 (31.08%)	16 (17.58%)	14 (24.56%)	
Absent	16 (100%)	3 (3.29%)	13 (22.8%)	

CAM+ : CAM user ; CAM- : non-CAM user ; IDC : invasive ductal carcinoma ; IDC + DCIS : invasive ductal carcinoma associated with ductal carcinoma in situ ; NSIC : non-specific invasive carcinoma ; ILC : invasive lobular carcinoma. Participants predominantly had CCI and received chemotherapy. Prevalence of CAM use was 61.48%, and its use was correlated with professional status (p=0.0413), chemotherapy (p=0.00339), and adverse effects (p=0.0002).

Table III: chemotherapy adverve effetcs	
Adverse effects type	**n (%)**
Alopecia	15 (6.22%)
Anemia	29 (12.03%)
Anorexia	20 (8.3%)
Asthenia	22 (9.13%)
Constipation	01 (0.41%)
Cytolysis	01 (0.41%)
Diarrhea	08 (3.32%)
Dizziness	01 (0.41%)
Epigastric pain	01 (0.41%)
Fever	02 (0.83%)
Hand-foot syndrome	02 (0.83%)
Headaches	01 (0.41%)
Mucositis	02 (0.83%)
Myalga	01 (0.41%)
Nausea	05 (7.47%)
Neuropathy	03 (1.24%)
Neutropenia	73 (30.29%)
Paresthesias	10 (4.14%)
Thrombocytopenia	02 (0.83%)
Vomiting	28 (11.62%)
Weight loss	01 (0.41%)

Neutropenia (30.29%), anemia (12.03%), and asthenia (9.13%) were the most frequently reported adverse manifestations.

Table IV: list of registered CAMs			
Scientific name	**Common name**	**Family**	**n (%)**
-	Alkaline water	-	1 (0.38%)
-	Dietary supplements	-	7 (2.63%)
-	Fruit juice	-	5 (1.88%)
-	Selenium	-	1 (0.38%)
-	Unknown composition	-	72 (27.07%)
-	Unsweetened milk	-	5 (1.88%)
-	Vitamin C	-	2 (0.75%)
Adansonia digitata	Baobab	Bombacaceae	3 (1.13%)
Ageratum conyzoides	Kings of herbs	Asteraceae	1 (0.38%)
Allium ampeloprasum	Leek	Alliaceae	1 (0.38%)
Allium sativum	Garlic	Liliaceae	4 (1.5%)
Aloe vera	Aloe vera	Asphodelaceae	5 (1.88%)
Ananas comosus	Pineapple	Bromeliaceae	1 (0.38%)
Annona muricata	Soursop leaves	Annonaceae	26 (9.77%)
Apis mellifera	Honey	Apideae	2 (0.75%)
Arachis hypogaea	Peanut	Fabaceae	2 (0.75%)
Arthrospira platensis	Spirulina	Cyanobacteries	1 (0.38%)
Azadirachta indica	Neem (oil. bark. root)	Meliaceae	3 (1.13%)
Beta vulgaris L	Beetroot	Amaranthaceae	6 (2.26%)
Carica papaya	Papaya (roots)	Caricaceae	1 (0.38%)
Citrus limon	Lemon	Rutaceae	4 (1.50%)
Combretum micranthum	Kinkeliba	Combretaceae	1 (0.38%)
Cucumis sativus	Cucumber	Cucurbitaceae	1 (0.38%)
Curcuma longa	Turmeric	Zingiberaceae	6 (2.26%)
Cymbopogon citratus	Lemongrass	Poaceae	1 (0.38%)
Daucus carota	Carrot	Apiaceae	2 (0.75%)

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Gnetum africanum	Okok (leaves)	Gnetaceae	25 (9.40%)
Hibiscus sabdariffa	Sorrel leaves	Malvaceae	32 (12.03%)
Ipomoea batatas	Potato (juice)	Convolvulaceae	1 (0.38%)
Mangifera indica L	Mango leaves	Anacardiaceae	3 (1.13%)
Manihot esculenta	Cassava leaves	Euphorbiaceae	8 (3.01%)
Ocimum gratissimum	Wild basil	Lamiaceae	1 (0.38%)
Persea americana	Avocado	Lauraceae	2 (0.75%)
Petroselinum sativum	Parsley	Apiaceae	1 (0.38%)
Psidium guajava	Guava leaves	Myrtaceae	1 (0.38%)
Raphanus sativus	Radish	Brassicaceae	1 (0.38%)
Sesamum indicum	Sesames (seed)	Pedaliaceae	1 (0.38%)
Solanum lycopersicum	Tomato	Solanaceae	1 (0.38%)
Solanum melongena L	Eggplant	Solanaceae	3 (1.13%)
Solanum torvum	Wild eggplant	Solanaceae	12 (4.51%)
Solanum tuberosum	Potato	Solanaceae	1 (0.38%)
Syzygium aromaticum	Clove	Myrtaceae	2 (0.75%)
Theobroma cacao	Cocoa	Malvaceae	1 (0.38%)
Zingiber officinale	Ginger	Zingiberaceae	5 (1.88%)

More than half of CAM users did not know its composition (27.07%). *H. sabdariffa* (12.03%), *A. muricata* (9.77%) and *G. africanum* (9.40%) were the most commonly used medicinal plants.

Table V: Reasons for using CAM and their adverse effects

Reasons for using CAM	N
To cure breast cancer	45 (49.46%)
To slow tumor progression	9 (9.9%)
To relieve the disease symptoms	11 (12.09%)
Absent	26 (28.57%)
Adverse effects	**n (%)**
No	48 (32.43%)
Yes	15 (10.14%)
Absent	28 (18.92%)
Adverse effects types	
Breast volume augmentation	1 (5%)
Breast pain	1 (5%)
Epigastric pain	5 (25%)
Diarrhea	5 (25%)
Asthenia	1 (5%)
Paresthesia	1 (5%)
Dizziness	1 (5%)
Nausea	1 (5%)
Vomiting	2 (10%)
Missing	2 (10%)

CAM was primarily used to cure cancer (49.46%) and relieve the symptoms of the disease (12.09%). Ten percent of CAM users experienced at least one adverse effect and the most common were epigastric pain (25%), diarrhea (25%) and vomiting (10%).
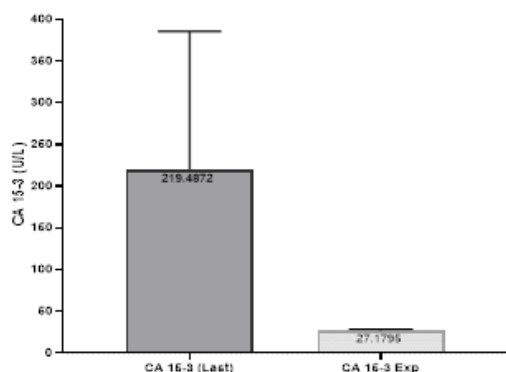
Exposure of patients to CAM has not significantly lowered the level of CA 15-3.
Figure: patients CA 15-3 level before and during the study

DISCUSSION

Breast cancer management remains a challenge in developing countries [24]. Unlike developed countries, there is a wealth of data on the use of CAM among women suffering from breast cancer [25-30]. The study population had an average age of 47.7 ± 10.73 years, with the age group of 30 to 50 years being the most represented (Table I). These results are consistent with those reported by Kenfack *et al.* [31]. Aliyu *et al.* [32], and Zingue *et al.* [33]. In agreement with several authors [32, 33], this work reported that IDC was the most frequent histological type (Table II). In SSA, breast cancer predominates over other types; age is a risk factor, and a significant incidence is recorded in the 30 to 55 age range [4, 34]. Chemotherapy was the main treatment, aligning with the findings of Aliyu *et al.* [32], but contrary to those of Kenfack *et al.* [31]. Iatrogenesis affected 68.91% (102/148) of participants exposed to chemotherapy (Table III). Han *et al.* [8] reported a prevalence of 52%. Indeed, anticancer drugs are a particularly toxic class, and this toxicity can be exacerbated by various therapeutic combinations [35, 36].

CAM refers to all medicines other than conventional medicine used to treat various pathologies [15, 16] and the prevalence of CAM use in this study was 61.48% (91/148). Similar results were reported by Naja *et al.* [37], Kiwanuka *et al.* [38], and Jaradat *et al.* [39]. This high prevalence is partly due to the fact that in SSA, nearly 80% of the population turns to CAM for treatment [40]. In this study, the use of CAM was associated with patients who had a fixed monthly income, chemotherapy, and the occurrence of adverse effects (Table IV). These results aligned with those of Sárváry *et al.* [28] regarding professional status but contrasted with those of Jaradat *et al.* [39], who noted a correlation with education level, type of surgery, and hormone therapy. Naja *et al.* [37] mentioned an association with the stage of the disease, and Aliyu *et al.* [32] noted male gender and the absence of comorbidities. Additionally, factors such as accessibility, availability of CAM, failures of conventional medicine, fear of surgery, religion, and socio-economic status can be listed [41-45]. Nearly one-third of CAM users stated that they did not know the exact name of their treatment, which is similar to the results of Mwaka *et al.* [41]. This may be explained by their reluctance to disclose information to the investigators, who were also nurses from the department. The fear of being blamed and stigmatized by healthcare staff, combined with their lack of knowledge regarding CAMs and consequently, their lack of interest in discussing them with the staff, are some reasons for non-disclosure mentioned by some authors [13, 41]. *H. sabdariffa, A. muricata* and *G. africanum* were the most cited CAMs, which also possess cytotoxic and antitumor properties [48, 49] and phytoconstituents potentially anticancer in the case of *G. africanum* [49]. Plant-based treatments are often perceived as "natural" and therefore less toxic than conventional medications [51]. However, they can induce harmful drug interactions, reduce their effectiveness, or lead to adverse events [29, 52, 53]. Thus, during this study, 10% of CAM consumers exhibited at least one adverse effect (Table V), as observed in other studies [32, 53].

Tumor antigen CA 15-3 is a glycoprotein synthesized on the apical surface of epithelial cells in the mammary gland. Due to the presence of a tumor or a more advanced stage of the disease, its expression is increased [54]. CA 15-3 is therefore useful for determining the extent of breast cancer spread. A high plasma concentration is an indicator of metastases, particularly bone metastases [55]. The average value of CA 15-3 for thirty-eight patients was 219.5 ± 166.1, versus 27.18 ± 10.21 U/ml in experimental conditions (Figure). This observation suggests a complementary effect of CAM, as synergistic and/or potentiation effects can occur when CAM is combined with conventional treatment [19-21]. Bai *et al.* [56] observed a decrease in CA 15-3 levels and an improvement in the quality of life in breast cancer patients exposed to CAM in conjunction with Western medicine. Other authors agree with this improvement in quality of life following exposure to CAM [57, 58]. However, the study design did not permit the collection of CA 15-3 data from all patients, thereby hindering an assessment of the impact of CAM on this parameter. Additionally,

participants' refusal to disclose the CAMs they used may obscure potentially effective CAMs or those associated with adverse drug events.

CONCLUSION
The use of CAM involved more than half of the participants, primarily consisting of treatments based on medicinal plants. The use of CAM was associated with professional status, type of treatment and the occurrence of adverse effects. CA 15-3 level was not significantly decreased following exposure to CAM.

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