Review

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Facebook counseling in the field of complementary and alternative medicine among Polish breast cancer patients: a narrative review

Abstract

Introduction: Breast cancer (BC) patients often use complementary and integrative therapies as supportive care as suggested by online sources during cancer treatment and when coping with the side effects of treatment. However, the evidence for the effectiveness of such therapies is limited. This review aimed to critically analyze Facebook's advice to women with BC regarding the use of complementary and alternative medicine (CAM) and assess their safety and effectiveness.

Methods: Narrative review.

Results: The search yielded 1,300 pieces of advice provided by the community of Facebook groups. These were analyzed, and their safety and effectiveness were assessed. Many different CAM therapies were identified, which were grouped into five categories.

Conclusions: Currently, searching for information on CAM on Polish-language Facebook groups by breast cancer patients poses a risk of obtaining advice of unproven effectiveness. Patients are exposed to suggestions that they should take products that may interact with conventional treatment or that they may be persuaded to give up conventional treatment. Cancer care providers should consider the complexity and implications of the unmet need for information and support for breast cancer patients that result in seeking CAM advice on Facebook groups. Measures should be taken to ensure that breast cancer patients can find reliable evidence on CAM online and on social media.

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Keywords: complementary and alternative medicine, breast cancer, online health information-seeking, social media, misinformation

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Introduction

Complementary medicine includes therapies used in addition to conventional medicine. Alternative medicine includes therapies used in place of conventional medicine, while integrative medicine is the coordinated use of evidence-based complementary practices and conventional care [1]. Integrative oncology refers to complementary and integrative therapies with conventional oncology care [2]. In oncological diseases, patients use complementary and integrative therapies intending to improve well-being, improve quality of life (QOL), and alleviate the symptoms of the disease and the side effects of conventional treatments. The most common types of complementary and alternative medicine (CAM) include herbal products and dietary supplements such as vitamins and minerals [3–6]. Breast cancer (BC) patients often use complementary and integrative therapies as supportive care during cancer treatment and when coping with the side effects of treatment [7, 8]. However, the evidence for the effectiveness of such therapies is limited [9]. CAM among patients is perceived as safe and is usually self-administered without prior consultation with a physician. Despite the widespread belief among patients that vitamins or plant-derived therapies are inherently safe, there is growing evidence that caution should be exercised [10]. Some CAM methods, especially herbal products, vitamins, and minerals, can hurt the treatment process of patients, leading to disease complications, the omission of conventional treatment toxicity, and drug interactions [5, 11, 12]. Herbal products contain many natural chemicals that share metabolic pathways with some anti-cancer drugs, potentially leading to under- or over-exposure to these drugs and consequently to treatment failure or increased toxicity. Therefore, CAM-drug interactions are a significant concern when treating cancer patients [11, 13, 14]. The potential interactions between CAM and anticancer drugs are estimated to be around 55–85% in patients taking both types of treatment [15]. These results may be underestimated because patients rarely inform healthcare professionals about the use of CAM.

During the COVID-19 pandemic, cancer patients experienced particular difficulties and barriers in using the services of formal healthcare facilities, which undoubtedly could have influenced the increased interest in CAM methods among this group of patients and the transfer of their activity towards the use of social media to meet therapeutic needs and expectations [16]. Social networks allow greater access to health-related information and provide a point of free communication between people living with similar chronic diseases [17]. The results of a systematic review examining the use of social media by healthcare professionals suggest that healthcare providers see social media platforms as valuable tools to help patients self-manage chronic conditions [18]. When patients access health-related information on Facebook, their primary motives are to receive social support, exchange advice and increase knowledge [19]. In addition, the exchange of information regarding specific diseases and related problems occurs in Facebook groups. Nowadays, social media has become an important and common mechanism for providing support in self-management, coping, and treatment of chronic diseases [20].

Previous research has shown that Facebook groups are a communication tool used by patients seeking information or support for BC [21]; however, there is a gap in research examining what self-healing and self-management content is communicated on Facebook groups related to CAM therapies for BC.This review aimed to critically analyze Facebook's advice to women with BC regarding the use of CAMs and assess their safety and effectiveness.

Methods

Facebook data search design and procedure

The procedure of searching for groups on Facebook for the selection of groups involved creating a new account on the Facebook platform after deleting all browsing history and cookies from the internet browser (Google Chrome). Two researchers individually then entered terms related to complementary and alternative medicine (alternative medicine, complementary medicine, natural medicine, natural therapies, herbs, herbal medicine, Chinese medicine, homeopathy, and Ayurvedic medicine) in the Facebook group category. After searching for each term, the first five groups found in the browser, the members of which exceeded 50 thousand people, were joined. The next step was to send a request to the administrator of each group regarding the possibility of searching posts in the group for CAM advice.

Inclusion/exclusion criteria for Facebook groups

The analysis was limited to all public and closed Facebook groups related to CAM, where the content was posted in Polish. Secret Facebook groups or those that did not appear in the Facebook group search were excluded from the analysis because only individual Facebook users who were invited by the Secret

Group admin or a current Facebook member can see the group title, description, members, and content. In addition, any closed group that did not accept the researchers' request to join the Facebook group before data collection began was excluded, as group posts can only be viewed by members alone.

Collection of data related to complementary and alternative medicineadvice

After obtaining the administrator's consent to join the group, two researchers independently searched for a specific group of content or entries related to BC employing the search engine, using terms such as "breast cancer", "breast neoplasm", "breast", and "breasts". Only posts regarding patients seeking help in the treatment and/or management of BC symptoms in 2020–2022 were analyzed. The analysis excluded posts concerning benign breast tumors, cysts, and posts in which the author indicated that she had not yet received a final diagnosis of a lesion in the breast. Advice posted in the comments by other members of the groups was then collected. The advice was selected in six categories: (a) herbs and plant products (*per os*), (b) vitamins and minerals, (c) mushrooms, (d) discouraging/encouraging conventional medicine, and (e) other.

Assessment of the safety and effectiveness of CAM therapies recommended by users in the form of advice on Facebook groups, taking into account the evidence-based medicine (EBM) guidelines.

Complementary and alternative medicine therapy advice provided on Facebook groups that appeared 20 or more times was found in the NatMed Pro database. Detailed information regarding the inclusion criteria of studies is provided in Table S1 and Table S2. A scoping review method is an approach that allows for the inclusion of diverse methodologies (*i.e.* experimental and non-experimental research) and has a significant impact on EBM. The approach can be used to map fields of a topic where it is difficult to visualize the range of material categories, contributing to the presentation of varied perspectives on a phenomenon of concern. The steps proposed by Arksey and O'Malley [22] were followed to conduct this review, which includes 5 stages: identifying the research question; identifying relevant studies; study selection; charting the data; and collating, summarizing, and reporting the results. Complete further meta-analysis or sub-group analysis was not intended due to the heterogenicity of the study designs included in this review.This scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis extension for Scoping Reviews (PRISMA-ScR) checklist (Table S3).

Search strategies and study selection

A NatMed Pro database search was conducted by two investigators. NatMed Pro is a subscription database presenting up-to-date clinical data on natural medicines, herbal medicines, and dietary supplements used in the Western world [22]. Compiled by pharmacists and physicians, it is an online tool that collects evidence-based research from impartial, peer-reviewed sources. It enables the assessment of potential interactions between the drug and CAM, as well as the assessment of safety and effectiveness. The study inclusion criteria and search strategy are presented in the Supplementary Materials, Table S2.

In the first stage, the "Effectiveness Checker" tool was applied to check how effective the proposed CAM methods are in the treatment of breast cancer. In the second stage, the "Interaction Checker" tool was employed to analyze potential interactions between conventional treatment and CAM products. The data selection process is presented in Figure 1. Data including the authors' name, year of publication details of the interventions, and outcome measures or conclusions were compiled in Table S4.

Results

Advice on CAM for breast cancer

Of the 12 groups that met the inclusion criteria for the study, the administrators of 7 groups accepted the researchers' request to join the group, of which no posts regarding BC were found in the two groups. Detailed information on the groups is included in Table S1.

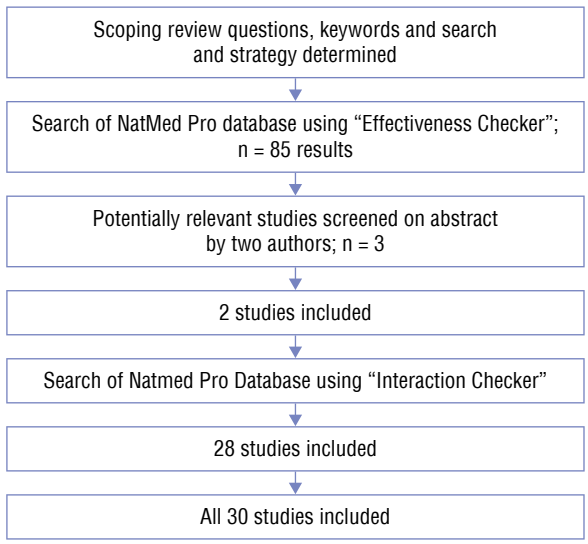

Figure 1. The data selection process

Table 1 presents the characteristics of advice recommending the use of CAM in BC therapy found on Facebook groups. Ultimately, 29 posts were analyzed, from which 1437 CAM advice offerings on BC were collected. The most common advice was to take herbs and plant products (N= 560; 39.01%) and vitamins and minerals (n = 351; 24.4%) (Table 1). The most frequently recommended herbs and plant products were beetroot (n = 70; 12.5%), dandelion (n = 51; 9.1%), cannabidiol (n = 44; 7.9%), flax seed (n = 36; 6.4%) and the fungus chaga (n = 19; 43.2%) (listed separately), with vitamins and minerals being: iodine (n = 132; 37.6%), vitamin D (n = 84; 23.9%) and vitamin C (n = 65; 18.5%). Other recommended therapies included castor oil compress (n = 85; 24.6%), amygdalin (n = 43; 12.5%), and baking soda compress (n = 36; 10.4%). Regarding recommendation of conventional medicine: encouragement (n = 102; 74.5%); discouragement (n = 35; 25.5%).

Table 1.Characteristics of recommended CAMs for women with breast cancer by the community on Facebook groups

Type of CAM	n [%]
Herbs and plant products	**560 (100)**
Beetroot (*Beta vulgaris*)	70 (12.5)
Dandelion (*Taraxacum officinale*)	51 (9.1)
Cannabidiol (CBD)	44 (7.9)
Flax seed (*Linum usitatissimum*)	36 (6.4)
Urtica (*Urtica dioica*)	28 (5.0)
Turmeric (*Curcuma*)	27 (4.8)
Black seed (*Nigella sativa*)	19 (3.4)
Burdock (*Arctium*)	18 (3.2)
Common wormwood (*Artemisia absinthium*)	18 (3.2)
Evening-primroses (*Oenothera*)	17 (3.0)
Graviola (*Annona muricata*)	16 (2.9)
Delta-9-tetrahydrocannabinol (THC)	16 (2.9)
Cleavers (*Galium aparine*)	14 (2.5)
Greater celandine (*Chelidonium majus*)	14 (2.5)
Capsaicin	11 (2.0)
Swedish Bitters	10 (1.8)
Other	151 (26.9)
Vitamins and minerals	**351 (100)**
Iodine	132 (37.6)
Vitamin D	84 (23.9)
Vitamin C	65 (18.5)
Vitamin K	19 (5.4)
Selenium	18 (5.1)
Zinc	12 (3.4)
Other	21 (6.0)
Mushrooms	**44 (100)**
Chaga (*Inonotus obliquus*)	19 (43.2)
Other	25 (56.8)
Other therapies	**349 (100)**
Castor oil compress	85 (24.6)
Amygdalin	43 (12.5)
Baking soda compress	36 (10.4)
Recall healing	26 (7.5)
Yellow tulip bulb ointment	17 (4.9)
Other	138 (40.0)
Other	**137 (100)**
Encouraging the use of conventional medicine	102 (74.5)
Discouraging the use of conventional medicine	35 (25.5)

CAM — complementary and alternative medicine; n — the number of comments with a recommended product in a given category

Effectiveness of complementary and alternative medicine therapy of advice posted on Facebook groups

Based on the NatMed Pro database search, information was found on the effectiveness of products such as flax seed and vitamin C in BC treatment. Studies on breast cancer prevention were excluded.

Flaxseed

A small clinical study shows that dietary flaxseed has the potential to reduce tumor growth in postmenopausal patients with breast cancer. Consuming a muffin containing ground flaxseed reduces markers of tumor cell proliferation [23].

Vitamin C

A meta-analysis results suggest that post-diagnosis vitamin C supplementation may be associated with a reduced risk of total mortality and breast cancer-specific mortality. Vitamin C supplementation is associated with a 15% lower risk of breast cancer-related mortality when compared to no supplementation [24]. On the other hand, a large observational study in patients with breast cancer undergoing radiotherapy shows that Vitamin C supplementation does not reduce the risk of breast cancer recurrence. Although the vitamin C group had notably less aggressive tumor types, recurrence-free survival was similar in both vitamin C and control groups [25].

Interactions between complementary and alternative medicine and conventional treatment

Based on the NatMed Pro database search, information was found on potential interactions with

conventional treatment in such CAM products as black seed (*Nigella sativa*), cannabidiol (CBD), chaga (*Inonotus obliquus*), dandelion (*Taraxacum officinale*), evening primrose (*Oenothera biennis*), greater celandine (*Chelidonium majus*), delta-9-tetrahydrocannabinol (THC), selenium, turmeric (*Curcuma longa*), vitamin C and vitamin D. The analysis included drugs used in the treatment of breast cancer, such as tamoxifen, letrozole, exemestane, doxorubicin, cyclophosphamide, epirubicin, paclitaxel, docetaxel, carboplatin, methotrexate, mitomycin, and vincristine. Identified were 132 combinations of potential interaction of CAM products and anticancer agents. Among this n = 82 (62.9%) revealed no interaction risk, n = 45 (34.1%) hypothetical interaction risk, and 4 potential clinical interaction risk (3%). Table 2 presents potential interactions between herbal medicines and anticancer agents.

Black seed

Black seed may interact with tamoxifen and cyclophosphamide. *In vitro* researches suggest that black seed, especially thymoquinone, the main bioactive compound, may increase levels of drugs metabolized by CYP2C9 [26]. Black seed might also interfere with immunosuppressive therapy. The effect of black seed is unclear. Some animal studies suggest that it might stimulate immune function [27, 28] while others suggest that it may suppress [29, 30].

Cannabidiol

Cannabidiol might have interactions with tamoxifen, letrozole, exemestane, doxorubicin, cyclophosphamide, paclitaxel, docetaxel, and vincristine. *In vitro* studies show that cannabidiol (CBD) inhibits CYP2C9, CYP3A4, and CYP2C19 and suggest that it plays an essential role in herb-drug interaction [31]. CBD intake might also increase levels of drugs metabolized by CYP2C8 and increase levels of certain glucuronidated drugs. *In vitro* researches also show that cannabidiol inhibits uridine diphosphoglucuronosyl transferase (UGT) 1A9 and UGT2B7, enzymes responsible for glucuronidation [32]. That suggests that CBD could decrease the clearance and increase levels of glucuronidated drugs. Additionally, in one case report, women who were taking tamoxifen and cannabidiol were found to be presented with a 9.2% increase in N-desmethyl tamoxifen and an 18.8% increase in endoxifen levels after discontinuing cannabidiol for 67 days [33].

Chaga

Chaga may interact with cyclophosphamide. *In vitro* researches demonstrate that certain constituents of chaga (polysaccharides) stimulate immune function and might interfere with immunosuppressive therapy [34].

Dandelion

Dandelion could potentially interfere with Tamoxifen and Doxorubicin. Dandelion intake may increase the clearance of drugs that are UGP substrates. Studies conducted in female rats reveal that consumption of dandelion tea increases (244% of control) the activity of phase II detoxifying enzyme UGP [35].

Evening primrose

Evening primrose may interact with Tamoxifen. *In vitro* studies show that intake of evening primrose may increase the level and clinical effects of *CYP2C29* substrates [36].

Greater celandine

Greater celandine might have interaction with tamoxifen, cyclophosphamide, and methotrexate. *In vitro* researches indicate that consumption of greater celandine inhibits CYP2D6 enzyme activity and may increase levels of drugs metabolized by CYP2D6 [37]. Greater celandine intake can also affect the liver, it has been linked to many cases of hepatotoxicity [38–40]. Co-treatment with greater celandine and hepatotoxic drugs might, therefore, increase the risk of liver damage. Moreover, clinical research suggests that greater celandine might stimulate immune responses, so might decrease the effects of immunosuppressive therapy [41].

Delta-9-tetrahydrocannabinol

Delta-9-tetrahydrocannabinol (THC) could potentially interact with tamoxifen, letrozole, doxorubicin, cyclophosphamide, paclitaxel, and vincristine. *In vitro* researches show that THC moderately increases levels and adverse effects of CYP2C9 and CYP3A4 substrates [42, 43]. THC intake may also alter levels of drugs that are substrates of P-glycoprotein (P-gp). Most *in vitro* researches suggest that THC can inhibit P-gp and increase the accumulation of probe compounds by reducing P-gp-mediated drug efflux [44, 45].

Selenium

Selenium may interact with cyclophosphamide. Preliminary clinical studies suggest that selenium intake may stimulate the immune system and may reduce the effectiveness of immunosuppressant therapy [46].

Turmeric

Turmeric can theoretically interact with every drug selected in this review. *In vitro* and animal research

Table 2.Potential interactions between herbal medicines and anticancer agents

	Tamoxifen	Letrozole	Exemestane	Doxorubicin	Cyclopho-sphamide	Epirubicin	Paclitaxel	Docetaxel	Carboplatin	Methotrexate	Mitomycin	Vincristine
Black seed	CYP2C9				IMM							
CBD	CYP2C9 CYP3A4 UGT	CYP2C19 CYP3A4	CYP3A4	CYP3A4	CYP2C19 CYP3A4		CYP2C8 CYP3A4	CYP3A4				CYP3A4
Chaga					IMM							
Dandelion	UGT			UGT								
Evening primrose	CYP2C9											
Greater celandine	CYP2D6 HEP				HEP IMM					HEP		
THC	CYP2C9 CYP3A4 P-gp	CYP3A4		CYP3A4 P-gp	CYP3A4		CYP3A4 P-gp					CYP3A4 P-gp
Selenium					IMM							
Turmeric	CYP3A4 HEP P-gp	CYP3A4	CYP3A4	AE CYP3A4 P-gp	AE CYP4A4 HEP	AE	CYP3A4 P-gp	CYP3A4	AE	HEP	AE	CYP3A4 P-gp
Vitamin C				AE	AE	AE			AE		AE	
Vitamin D	CYP3A4	CYP3A4	CYP3A4	CYP3A4	CYP3A4		CYP3A4	CYP3A4				CYP3A4
	No expected interaction				Theoretical interaction				Potential clinical interaction			

Red — inhibition; green — increase; violet — controversial in references

AE — antioxidant effects; CBD — cannabidiol; CYP2C9 — cytochrome P2C9 (etc.); HEP — might increase the risk of hepatoxicity; IMM — interfere with immunosuppressive therapy; THC — delta-9-tetrahydrocannabinol; UGT-UDP — glucuronosyltransferase

show that consuming turmeric might increase levels metabolized by CYP3A4 [47, 48]. *In vitro* and animal studies show turmeric intake might also increase the absorption of P-glycoprotein substrates and hold potency to cause herb-food interactions [49, 50]. Turmeric has antioxidant effects. Theoretically, this may reduce the activity of chemotherapy drugs that generate free radicals. However, research is conflicting [51].

A small clinical trial in patients with breast cancer taking tamoxifen shows that co-treatment with curcumin could lower endoxifen concentrations below the threshold for efficacy (potentially 20–40% of the patients) [52]. Additionally, a few case reports show that turmeric consumption may increase the risk of liver damage when hepatotoxic drugs are prescribed, especially when taken in high doses [53, 54].

Vitamin C

Vitamin C could potentially interfere with doxorubicin, cyclophosphamide, epirubicin, carboplatin, and mitomycin. The antioxidant effects of vitamin C might reduce the effectiveness of antitumor antibiotics. More evidence is needed to determine the effects that vitamin C could potentially have on chemotherapy because there are many opinions about the risks or benefits of antioxidant supplementation [55].

Vitamin D

Vitamin D intake might interact with tamoxifen, letrozole, exemestane, doxorubicin, cyclophosphamide, paclitaxel, docetaxel, and vincristine. Vitamin D might affect CYP3A4 enzyme activity and reduce the bioavailability of CYP3A4 substrates. *In vitro* research suggests that vitamin D induces CYP3A4 transcription [56].

Discussion

Social networks such as Facebook provide access to health-related information and enable communication between people with similar health problems. However, the unmet needs of patients to manage their symptoms, coupled with a desire to use natural methods to improve their health, mean that patients seeking guidance on complementary health approaches may result in making decisions based on recommendations gathered from resources of varying credibility without any professional education. The Internet is a significant source of health misinformation that threatens public health because it hinders the delivery of evidence-based medicine, as well as negatively impacts the patient–doctor relationship, while the use of unproven therapies is associated with reduced survival [10, 57, 58].

Our research has shown that BC patients commonly seek information on CAM to treat their disease. Herbs, plant products (43.1%), and vitamins and minerals (27.0%) were the most frequently proposed CAM products. These results align with previous study reports on the most commonly used CAMs by patients [59, 60]. Natural compounds derived from plants have provided a range of useful chemotherapeutic drugs for malignant tumors due to their wide range of anti-cancer effects, and vitamin or mineral deficiencies are observed among BC patients. However, most of the evidence cited confirms that the CAMs recommended by Facebook users are not effective and most may lead to interactions with conventional drugs. The quality of herbal products and the lack of strong scientific evidence currently make integrating them into conventional cancer care practices difficult. A factor that complicates the assessment of the quality and safety of herbs and other plant products is their complexity and high variability.

Clinical studies reviewed in the present study citing in favor of CAM for BC show that products such as flaxseed [23] and vitamin C [24, 25] can be used to support the effects of conventional medicinal products. However, these products are not able to produce a therapeutic effect on their own as suggested by the group members. In addition, some of these products were effective or ineffective depending on the type of BC and whether the study patients were pre-menopausal or postmenopausal.

The results of the present study showed that the CAM products proposed by the community of Facebook groups can lead to interactions with conventional treatment. The results demonstrate that four of the CAM-drug interactions reveal potential clinical interaction and forty-five present hypothetical interaction risk. Additionally, proposed CAM treatments included methods such as castor oil poultice, yellow tulip bulb-ointment, recall healing, and baking soda poultice, for which the review found no credible scientific evidence of their effectiveness. It has also been observed that part of the Facebook group community discourages BC patients from using conventional medicine, which can result in a much lower chance of survival [58, 61].

The results ofthis research indicate that the CAM methods proposed by the Facebook community groups did not include mind-body practices such as yoga, meditation, acupressure, or relaxation techniques, which have proven effectiveness and safety in reducing the effects of common problems experienced by BC patients, including chemotherapy-induced nausea and vomiting (CINV) [62, 63], anxiety and depression [64, 65], pain [66–69] or which improve the quality

of life [64, 65, 70–72]. In addition, it was observed that the advice posted by the community groups did not include information on potential CAM-drug interactions or questions about whether and/or what conventional treatment is currently used among respondents seeking additional treatment methods.

The search for additional information and the use of CAM methods to treat and manage the symptoms of the disease and/or meet the psychological needs of many patients (which is associated with improved optimism and prospects), can affect recovery and potential cancer treatment outcomes [73]. Therefore, healthcare professionals must discuss the use of CAMs with patients, not only by discouraging ineffective and unsafe methods but also by recommending CAMs, the effectiveness and safety of which are scientifically proven. It is also important to increase the social media activity of medical CAM specialists to promote integrative oncology — a patient-centered, evidence-based field of cancer care that uses mind-body practices, natural products, and/or lifestyle modifications in addition to conventional cancer treatment derived from different traditions [2].

Strengths and limitations

The strengths of these studies require further consideration. First, to the best of the authors' knowledge, this is the first study to assess the phenomenon of Polish BC patients seeking information on CAM on the Facebook platform. It is also worth noting that the analyzed posts came from the period of the COVID-19 pandemic, when anti-epidemic procedures were in force, blocking women's access to formal healthcare facilities, which probably allowed them only partially to assess the scope of seeking direct advice from BC patients. On the other hand, for patients, perhaps it was a period of increased activity on FB groups as a form of meeting their health needs due to social isolation procedures during the pandemic. Second, the present work is also the first to assess whether the proposed CAM advice in Facebook groups is safe and effective, and it was done so by utilizing the credibility of the EBM evidence.

Nevertheless, this study has several limitations. Firstly, the study's design does not allow us to determine exactly which of the recommended CAM methods will be employed by BC patients. Secondly, it was not possible to obtain information on what conventional treatment they were currently receiving from posts by BC patients, so it was impossible to assess the exact risk of an interaction between CAM and conventional treatment. Thirdly, the safety and efficacy analysis of the recommended CAM methods was not a systematic review; therefore, not all information about the individual methods was disclosed. In addition, only posts from groups that were visible in the Facebook search engine and in which the administrator allowed the analysis of posted content were considered in the data collection process. Finally, the analyzed content did not include information on fan pages and other portals or forums outside the Facebook platform.

Conclusions

Currently, searching for information on CAM on Polish-language Facebook groups by BC patients poses a risk of obtaining advice of unproven effectiveness. In addition, patients are exposed to suggestions to take products that may interact with conventional treatment or may be persuaded to give up traditional treatment. There is a need to improve communication between BC patients and healthcare professionals about safe and effective CAM methods and the risk of CAM-drug interactions.

Cancer care providers should consider the complexity and implications of the unmet need for information and support for BC patients that result in seeking CAM advice on Facebook groups. On the other hand, measures should be taken to ensure that BC patients can also find reliable evidence on CAMs online in online forums and groups. Incorporating evidence-based CAM practices can be an important component of interventions aimed at improving BC patients' quality of life and survival. Further research is needed to determine which CAM methods are safe and effective as an integrative adjunct to conventional cancer therapies. This research can be used as a framework to develop educational materials for providers and patients on integrative oncology.

Article information and declarations

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None.

Ethics statement

The study was conducted by the Declaration of Helsinki. The Bioethics Committee has issued its Ethical Approval at the Medical University of Lublin (decision number: KE-0254/29/02/2022).

Author contributions

Conceptualization: ABJ, BJŚ; methodology: ABJ; formal analysis: ABJ; data curation: ABJ, BJŚ; writing — original draft preparation: ABJ; writing — review and editing: BJŚ, GJN; supervision: BJŚ, GJN; project administration: BJŚ, GJN. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflicts of interest.

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Supplementary material

The supplementary material (Tables S1–S4) for this article can be found online at https://journals.viamedica.pl/palliative_medicine_in_practice/article/view/100311.

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