


Interest in Integrative Medicine Among Postmenopausal Hormone Receptor-Positive Breast Cancer Patients in the EvAluate-TM Study

Integrative Cancer Therapies
2017, Vol. 16(2) 165–175
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DOI: 10.1177/1534735416668575
journals.sagepub.com/home/ict


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Abstract

Background. Breast cancer patients often use complementary and alternative medicine, but few prospectively collected data on the topic are available specifically for postmenopausal breast cancer patients. A large prospective study was therefore conducted within a noninterventional study in order to identify the characteristics of patients interested in integrative medicine. **Methods.** The EvAluate-TM study is a prospective, multicenter noninterventional study in which treatment with the aromatase inhibitor letrozole was evaluated in postmenopausal women with hormone receptor–positive primary breast cancer. Between 2008 and 2009, 5045 postmenopausal patients were enrolled at 339 certified breast centers in Germany. As part of the data collection process, patients were asked at the baseline about their interest in and information needs relating to integrative medicine. **Results.** Of the 5045 patients recruited, 3411 responded to the questionnaire on integrative medicine and took part in the analysis, 1583 patients expressed an interest in integrative medicine, and 1828 patients declared no interest. Relevant predictors of interest in integrative medicine were age, body mass index, tumor size, previous chemotherapy, and use of concomitant medications for other medical conditions. Interest in integrative medicine declined highly significantly ($P < .001$) with age (<50 years, 74.1%; 50-60 years, 54.1%; >65 years, 38.0%). Patients in favor of integrative medicine were significantly less satisfied with the information received about individual treatments and antihormonal therapy. Patients with interest in integrative medicine were more often interested in rehabilitation and fitness, nutritional counseling, and additional support from self-help organizations. These women were mostly interested in receiving information about their disease and integrative medicine from a physician, rather than from other sources. **Conclusions.** This study shows that a considerable proportion of postmenopausal breast cancer patients are interested in integrative medicine. Information about integrative medicine should therefore be provided as part of patient care for this group. It was found that receiving concomitant medication for other medical conditions is one of the main predictors for women not being interested in integrative medicine. This group of patients may need special attention and individualized information about integrative medicine. Additionally, most patients were interested in obtaining the relevant information from their doctor.

Keywords

integrative medicine, complementary and alternative medicine, breast cancer, oncology, letrozole, aromatase inhibitor, therapy management, information

Submitted Date: 20 February 2016; Revised Date: 9 August 2016; Acceptance Date: 17 August 2016

Introduction

Breast cancer is the most common type of tumor in women. One in every 8 women in Germany is likely to be diagnosed with breast cancer during her lifetime. There are more than 70 000 cases of breast cancer every year in Germany, with increasing incidence rates, and almost 17 500 women die of breast cancer each year. Breast cancer is the most frequent cause of death in women with cancer.^{1,2}

The prognosis for patients with breast cancer has clearly improved over the past few years. With the increasing numbers of breast cancer survivors, attention is turning to the side effects and possible sequelae of cancer therapies. Cancer treatments are often associated with side effects and a reduction in the quality of life.³⁻¹³ Another issue is that some therapies are associated with treatment side effects, leading to reduced compliance with and adherence to therapy and possibly resulting in the treatments being less effective. A treatment adherence rate of less than 70% has been reported for antihormonal breast cancer therapy.¹⁴

These may be some of the reasons why increasing numbers of breast cancer patients are using complementary and alternative methods (CAM) as supportive measures in

cancer therapy.^{15,16} For patients, the main motivations for using CAM are to alleviate therapy-induced toxicity, to enable them to become actively involved in the therapy, to improve physical health, and to increase the chances of the cancer being cured. The most important and most frequently used complementary methods in Germany are traditional homeopathy, anthroposophic medicine (specifically mistletoe therapy), classic naturopathic treatment, traditional Chinese medicine (TCM) including acupuncture, exercise, nutritional plans, vitamin supplements, mineral supplements, dietary supplements, and relaxation therapies.¹⁷⁻²¹

Studies have confirmed that CAM can help reduce the side effects of modern cancer therapies, as well as cancer symptoms.²²⁻²⁶ It has also been reported that CAM can improve the quality of life.^{20,21,27} There are, however, no data that support any improvement in the prognosis for breast cancer patients through the use of CAM.²⁸⁻³⁰

Various patient and disease characteristics have been described that are associated with CAM use. Caucasian ethnicity, female gender, young age, high educational status, high income, and a diagnosis of breast cancer have been described as predictors of more frequent CAM use. Frequent use has also been reported among patients who have a

symptomatic cancer disease and who are receiving conventional therapies. An interest in active coping behavior has also been reported to be associated with CAM use.³¹ Some patients have been described as using CAM not as a complementary treatment, but rather as a full alternative to conventional medicine.³²

Most patients seek information about CAM from print media, mass media (mainly television and radio), family and friends, the Internet, self-help groups, health care professionals, CAM providers, and health insurance companies.^{18,19,33-37} On the other hand, it has been reported that most patients using CAM do not discuss their CAM therapies with their physician and that CAM therapists do not coordinate their treatments with those of gynecological oncologists.³⁸ This lack of communication may be dangerous, as it might lead to drug interactions or even noncompliance.

Most of the data about CAM use and about predictors for its use derive from papers including heterogeneous groups of patients, or patients receiving heterogeneous treatments. However, therapy is becoming more and more individualized. It may, therefore, become necessary to collect more data on CAM use in homogeneously treated patients. Antihormonal therapy is widely used in postmenopausal, hormone receptor-positive women, with aromatase inhibitors being one of the standard treatments. With relevant side effects such as musculoskeletal problems and hot flashes, this form of treatment continues to be a problem in relation to motivation and adherence. Few data are available concerning patients' interest in integrative medicine to support the treatment of postmenopausal breast cancer during adjuvant aromatase inhibitor therapy. In the following text, "integrative medicine" is used as a term for the integration of complementary medicine into conventional treatment approaches; the term "CAM" has not been used because alternative medicine was not taken into account in the study.

Integrative medicine reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic and lifestyle approaches, health care and disciplines to achieve optimal health and healing.³⁹ Integrative medicine is not the same as alternative medicine, which refers to an approach to healing that is utilized in place of conventional therapies, or complementary medicine, which refers to healing modalities that are used to complement allopathic approaches,⁴⁰ or CAM, which includes all complementary and alternative methods of treatment, ranging from controversial to effective therapies.⁴¹ It addresses the full range of physical, emotional, mental, social, spiritual and environmental influences that affect a person's health, drawing on both conventional and complementary approaches within the current medical system.^{40,42}

The aim of the present study was to identify predictors of interest in integrative medicine in a homogeneous cohort of postmenopausal women who started treatment with the aromatase inhibitor letrozole. In addition, the question of preferred sources for information about integrative medicine and other supportive programs—such as rehabilitation, information about resuming working life, self-help groups, exercise, and nutrition—was explored.

Methods

Description of the Study

The EvAluate-TM Study (registration number: CFEM345DDE19; date of registration, March 8, 2008) is a prospective, multicenter, noninterventional and observational study in which treatment with the aromatase inhibitor letrozole was evaluated in postmenopausal women with hormone receptor-positive breast cancer.⁴³ It was conducted in accordance with the World Medical Association Declaration of Helsinki. The main aim of the study was to assess treatment compliance and reasons for therapy decisions. However, this is not reported on in the present study, which focuses on patients' interest in integrative medicine. Within the scope of the study, patients received the aromatase inhibitor letrozole at the recommended dosage of 2.5 mg per day in accordance with national drug approval stipulations. This means that letrozole therapy was exclusively determined by medical need. Contraindications listed in the product information details were used as exclusion criteria.

Between April 2008 and April 2009, 5045 postmenopausal patients at 339 study sites all over Germany were included in the EvAluate-TM Study. The only requirement to entitle a site to participate was that it formed part of a breast cancer center certified by the German Cancer Society (*Deutsche Krebsgesellschaft*) and the German Society for Breast Diseases (*Deutsche Gesellschaft für Senologie*).⁴⁴

Approval for the study was obtained from the ethical review committee in the Faculty of Medicine at Friedrich Alexander University of Erlangen-Nuremberg and the relevant ethics committees of all study centers involved (see the appendix). All patients provided written informed consent after receiving detailed instructions and before inclusion in the noninterventional study.

Data Acquisition

Before the start of therapy, data on patient and tumor characteristics were collected and documented in a remote data entry system (an electronic case report form). The tumor characteristics noted included stage and previous therapies. Patient information included common epidemiological characteristics, comorbidities, and concomitant medication.

In addition, both the physicians and the patients completed previously prepared questionnaires. Physicians completed questionnaires about the parameters that influenced their decision to use an aromatase inhibitor to treat their patients. In the context of data acquisition, the patients were asked at the beginning of the study whether they had any general interest in integrative medicine (“Are you interested in integrative medicine?”; a short definition of the term was given in the questionnaire), with the answers “yes” or “no” available. The patients were also asked to indicate the extent to which they were satisfied with the cancer therapy information they had been provided with, as well as the extent to which they were satisfied with follow-up care and supportive programs such as rehabilitation, information about resuming working life, self-help groups, exercise, nutrition, and also integrative medicine. Satisfaction was measured in five degrees: “very satisfied,” “satisfied,” “undecided,” “unsatisfied,” and “very unsatisfied.”

Statistical Methods and Considerations

The characteristics of patients who were interested in integrative medicine and patients who were not interested in it were compared using the appropriate unpaired statistical tests; *t* tests were used for continuous characteristics, and chi-square tests for categorical characteristics.

Two multiple logistic regression analyses with a backward stepwise variable selection procedure and with a *P* value <.01 as a selection criterion were performed in order to identify predictors for a patient’s interest in integrative medicine. The first regression model included patient and tumor characteristics—age at diagnosis, body mass index (BMI), tumor stage, nodal status, grading, adjuvant radiation (yes/no), adjuvant chemotherapy (yes/no), and concomitant medication (yes/no). The second regression model included patients’ statements about medical information and medical information sources (satisfied with information about surgical procedures; satisfied with information about antihormonal therapy; satisfied with information about side effects of antihormonal treatment; satisfied with information about concomitant medication; requesting further information about rehabilitation; requesting further information about psychological care; requesting further information about nutrition; requesting further information from advocacy groups; requesting further information from doctors; requesting further information from other sources). The dependent variable was the interest in integrative medicine. The multiple logistic regression analyses were adjusted for the covariates. The Wald test was performed for each variable and adjusted odds ratios (ORs) were estimated.

All of the tests were 2-sided, and a *P* value <.05 was regarded as statistically significant. Calculations were carried out using IBM SPSS Statistics for Windows, Version 21 (IBM Corporation, Armonk, NY, USA).

Results

Patient Characteristics

A total of 5045 patients were recruited in the EvAluate-TM study, and 5041 patients were documented in the database (excluding 4 patients). In order to focus on patients in the adjuvant setting, patients were excluded in the following hierarchical order: unknown therapy situation (375 patients were excluded), distant metastases at primary diagnosis (252 patients were excluded), and no therapy documented within 1 year after study inclusion (358 patients were excluded). A further 649 patients had to be excluded because they did not provide any information about their interest in integrative medicine. A total of 3411 patients thus remained for the analysis. The patient selection process is shown in Figure 1. A total of 1583 patients (46.4%) stated that they were generally interested in integrative medicine.

Univariate Analyses

Patient characteristics and their univariate association with an interest in integrative medicine are listed in Table 1. Age, BMI, the pathological tumor stage (pT), pathological nodal stage (pN), grading, previous (neo-)adjuvant chemotherapy or radiation therapy, and concomitant medication (at least 1 additional medication) at the start of the study were associated with the patients’ interest in integrative medicine. Their interest in integrative medicine decreased with increasing age, from 74.1% in patients aged <50 years to 38% in patients aged >65 years (*P* < .001). Overweight patients (BMI 25-30 kg/m², 46.75%; >30 kg/m², 41.4%) were also less interested in integrative medicine in comparison with women of normal weight (BMI 20-25 kg/m², 49.7%). Patients with a low tumor stage, previous (neo-)adjuvant chemotherapy, and no concomitant medication showed greater interest in integrative medicine than others. Nodal status, tumor grading, and prior radiation therapy were not associated with an interest in integrative medicine.

Characteristics relating to the patients’ degree of satisfaction with information provision are shown in Table 2, along with the association between these and an interest in integrative medicine. For all of the parameters assessed, greater satisfaction was associated with less interest in integrative medicine. In the group who were satisfied with the information they had received, 43% to 49% expressed an interest in integrative medicine, while among the patients who were not satisfied with the information, 52% to 64% expressed an interest in integrative medicine (Table 2).

The association between an interest in integrative medicine and interest in other information about additional programs in breast cancer care is shown in Table 3. Interest in integrative medicine was positively associated with an interest in all other programs and available information.

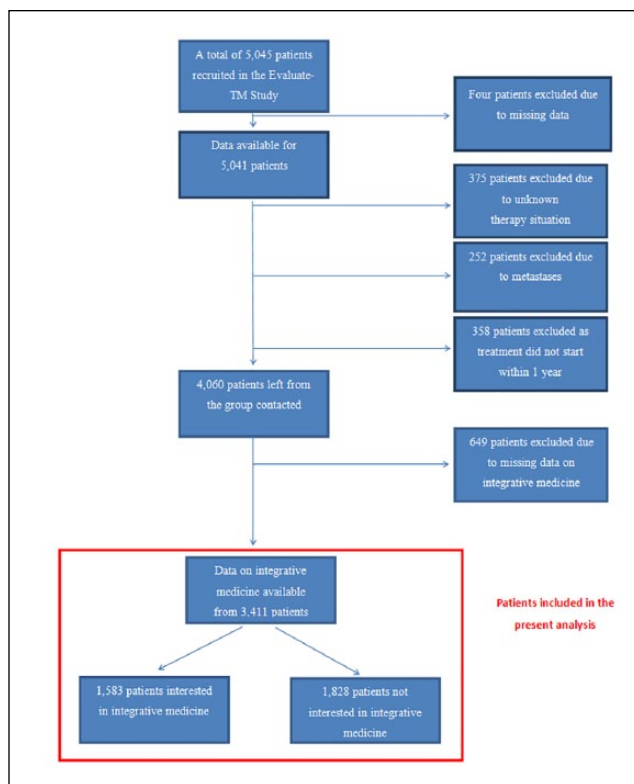


Figure 1. Patient recruitment algorithm.

To find out which factors were predictive for an interest in integrative medicine, 2 logistic regression analyses were conducted: one for patient and tumor characteristics and one to assess the association between an interest in integrative medicine and patients’ satisfaction with information provision and their interest in other breast cancer care programs. The results of the logistic regression model with an interest in integrative medicine as the dependent variable and patients’ characteristics and tumor characteristics as predictors are shown in Table 4. Age (OR per year, 0.95; 95% CI, 0.94-0.96), BMI (OR per kg/m², 0.98; 95% CI, 0.97-0.99), and concomitant medication (OR, 0.86; 95% CI, 0.74-0.99) were negatively associated with an interest in integrative medicine.

The results of the logistic regression model for the association with degree of satisfaction and further interest in other breast cancer care programs are shown in Table 5. With regard to satisfaction with the information provided, only satisfaction with information about anti-hormonal therapy remained in the regression model. With regard to interest in other breast cancer care programs, only interest in psycho-oncological care and information about social benefits for breast cancer survivors were omitted in the backward selection process. An interest in receiving additional information from a physician (OR, 6.1; 95% CI, 4.6-8.1) and an interest in

Table 1. Characteristics of Patients and Tumors: Univariate Analysis.

Characteristics	Total, n (%)	Integrative Medicine		P
		No, n (%)	Yes, n (%)	
Age, years				
<50	85 (100)	22 (25.9)	63 (74.1)	<.001
50-65	1596 (100)	733 (45.9)	863 (54.1)	
>65	1728 (100)	1072 (62.0)	656 (38.0)	
Body mass index, kg/m²				
<20	126 (100)	66 (52.4)	60 (47.6)	.004
20-25	1089 (100)	548 (50.3)	541 (49.7)	
25-30	1303 (100)	695 (53.3)	608 (46.7)	
>30	874 (100)	512 (58.6)	362 (41.4)	
Tumor stage				
I	2003 (100)	1034 (51.6)	969 (48.4)	.005
2-4	1399 (100)	790 (56.5)	609 (43.5)	
Nodal status				
N-	2167 (100)	1163 (53.7)	1004 (46.3)	.772
N+	1146 (100)	609 (53.1)	537 (46.9)	
Grading				
I	508 (100)	277 (54.5)	231 (45.5)	.677
2	2338 (100)	1240 (53.0)	1098 (47.0)	
3	542 (100)	297 (54.8)	245 (45.2)	
(Neo-)adjuvant radiotherapy				
No	1894 (100)	1035 (54.6)	859 (45.4)	.167
Yes	1517 (100)	793 (52.3)	724 (47.7)	
(Neo-) adjuvant chemotherapy				
No	2137 (100)	1203 (56.3)	934 (43.7)	<.001
Yes	1274 (100)	625 (49.1)	649 (50.9)	
Concomitant medication				
No	1427 (100)	693 (48.6)	734 (51.4)	<.001
Yes	1984 (100)	1135 (57.2)	849 (42.8)	

receiving nutritional advice (OR, 3.0; 95% CI, 2.2-4.0) were most strongly associated with an interest in integrative medicine (Table 5). A request for additional medical information provided by doctors showed the greatest predictive value ($P < .001$).

Discussion

Almost 50% of the patients in this cohort of postmenopausal, hormone receptor-positive breast cancer patients were interested in integrative medicine. In addition to commonly known predictors for an interest in integrative medicine, such as age, an interest in integrative medicine was also inversely associated with concomitant medication use and generally positively associated with dissatisfaction about the information provided concerning breast cancer treatment and with the patients’ interest in other additional breast cancer care programs. There was a very strong association with seeking information about integrative medicine from the treating physician.

Table 2. Univariate Analysis of Patients' Satisfaction With the Information Provided About Different Therapy Phases and Individual Fields of Antihormonal Therapy.

Characteristics	Total, n (%)	Integrative Medicine		P
		No, n (%)	Yes, n (%)	
Information after surgery				
Very satisfied or satisfied	3177 (100)	1724 (54.3)	1453 (45.7)	<.001
Undecided	122 (100)	45 (36.9)	77 (63.1)	
Unsatisfied or very unsatisfied	44 (100)	21 (47.7)	23 (52.3)	
Information about antihormonal therapy				
Very satisfied or satisfied	3005 (100)	1621 (53.9)	1384 (46.1)	.002
Undecided	151 (100)	63 (41.7)	88 (58.3)	
Unsatisfied or very unsatisfied	33 (100)	12 (36.4)	21 (63.6)	
Information about other counseling services				
Very satisfied or satisfied	1777 (100)	901 (50.7)	876 (49.3)	.014
Undecided	316 (100)	144 (45.6)	172 (54.4)	
Unsatisfied or very unsatisfied	110 (100)	42 (38.2)	68 (61.8)	
Information about follow-up care				
Very satisfied or satisfied	2453 (100)	1342 (54.7)	1111 (45.3)	<.001
Undecided	231 (100)	96 (41.6)	135 (58.4)	
Unsatisfied or very unsatisfied	91 (100)	35 (38.5)	56 (61.5)	
Information about side effects				
Very satisfied or satisfied	2733 (100)	1489 (54.5)	1244 (45.5)	.004
Undecided	224 (100)	105 (46.9)	119 (53.1)	
Unsatisfied or very unsatisfied	139 (100)	60 (43.2)	79 (56.8)	
Information about concomitant medicine				
Very satisfied or satisfied	1863 (100)	1054 (56.6)	809 (43.4)	<.001
Undecided	316 (100)	153 (48.4)	163 (51.6)	
Unsatisfied or very unsatisfied	193 (100)	81 (42.0)	112 (58.0)	

Few data are available concerning patients' interest in integrative medicine to support the treatment of postmenopausal breast cancer with adjuvant aromatase inhibitor therapy. The EvAluate-TM study is the first study that has examined the need for information about integrative medicine and relevant predictors in postmenopausal breast cancer patients receiving letrozole therapy. It is known from numerous studies that amongst other factors, Caucasian origin, female gender, young age, high educational level, high income, and a diagnosis of breast cancer are relevant predictors for the use of integrative medicine.^{19,33,45-47} All of the studies are in agreement that patients' interest in the use of integrative medicine decreases with increasing age.^{19,33,45} The present study confirms this. In addition, BMI and intake of concomitant medications were identified as further relevant predictors for an interest in integrative medicine. The OR for BMI was 0.980 ($P = .009$) and the OR for concomitant medication was 0.858 ($P = .042$).

The information sources on integrative medicine that are used by patients with breast cancer are very diverse: for example, mass media (especially television and radio), family and friends, Internet, self-help groups, health professionals, integrative medicine providers, and health insurance companies.^{18,19,33} Some studies have shown that, contrary to

expectations, oncologists play only a minor role in patients' access to information about integrative medicine, as compared with television, radio, books, journals, the Internet, and even friends and family.^{18,19,48} Indeed, some patients even conceal their use of integrative therapies from their oncologist.^{18,19,49} In the present study, however, the patients were mainly interested in obtaining information from their doctors. This applied in particular to information about integrative medicine.

With increasing age and BMI among patients, the risks of chronic diseases that are often associated with a variety of concomitant medications generally increase as well.^{50,51} This often leads to patients who are older and have a higher BMI lacking the motivation and willingness to pursue a healthy lifestyle and to endure more additional treatments in addition to their cancer and concomitant therapies. As a result, such patients often show no interest in integrative medicine. The same can be observed in patients who have an advanced tumor (pT2-4) at the initial diagnosis. They often have less initiative and incentive to take an active approach and are less willing to attend to their own health than patients with T1 tumors. In the advanced situation, with second-line, third-line, or later therapies, or in the palliative situation, the situation is different. Here the patients are usually strongly

Table 3. Univariate Analysis of Additional Services That Patients Would Like to Receive.

Characteristics	Total, n (%)	Integrative Medicine		P
		No, n (%)	Yes, n (%)	
Rehabilitation and fitness				
No	1549 (100)	1123 (72.5)	426 (27.5)	<.001
Yes	1761 (100)	669 (38.0)	1092 (62.0)	
Psycho-oncology				
No	2077 (100)	1394 (67.1)	683 (32.9)	<.001
Yes	1163 (100)	371 (31.9)	792 (68.1)	
Nutritional advice				
No	1644 (100)	1253 (76.2)	391 (23.8)	<.001
Yes	1658 (100)	529 (31.9)	1129 (68.1)	
Social services				
No	1058 (100)	774 (73.2)	284 (26.8)	<.001
Yes	2241 (100)	1009 (45.0)	1232 (55.0)	
Medical information from doctors				
No	1703 (100)	1359 (79.8)	344 (20.2)	<.001
Yes	1632 (100)	446 (27.3)	1186 (72.7)	
Self-help groups				
No	2244 (100)	1537 (68.5)	707 (31.5)	<.001
Yes	1042 (100)	264 (25.3)	778 (74.7)	
Other information				
No	2236 (100)	1507 (67.4)	729 (32.6)	<.001
Yes	1048 (100)	282 (26.9)	766 (73.1)	

Table 4. Multivariate Logistic Regression Analysis to Predict Requests for Information About Integrative Medicine, Using Patients' Characteristics as Predictors.

Characteristics	Value	OR	95% CI		P
			Lower Limit	Upper Limit	
Age (per year)	Per year	0.950	0.942	0.958	<.001
BMI	Per kg/m ²	0.980	0.967	0.994	.009
At least one concomitant medicine at study entry	No	1 (reference)			.042
	Yes	0.858	0.741	0.994	

Abbreviations: BMI, body mass index; CI, confidence interval; OR, odds ratio.

interested in integrative medicine and often use complementary methods in order to reduce the symptoms of the cancer and side effects of the oncological therapies and to improve their condition generally. Patients who have received chemotherapy as part of their cancer treatment often use integrative medical methods to reduce chemotherapy side effects in particular and to improve their quality of life. Patients with a normal weight, tumor stage T1, and no comorbidities also have a very strong awareness of health issues and are eager to contribute "everything possible" to recovering from the disease and maintaining their health.

The typical patient with an interest in integrative medicine also takes advantage of additional services significantly more often, such as rehabilitation and physical activity programs, psycho-oncological care, nutritional counseling, social and

medical services, additional medical information provided by doctors, support from self-help organizations, and other sources of information. In the present study, the patients often described the information they received as being unsatisfactory, or viewed it rather critically and requested supplementary information. These women were mostly interested in obtaining information about their disease from a physician. The reasons for this behavior were primarily a desire to promote the process of curing their disease, to alleviate treatment-induced toxicities, to improve their general well-being and quality of life, and to play an active part in the treatment process.^{16,19,47} The information options available on integrative medicine, however, differ widely in type, vary strongly in value, and are often of poor quality,⁵² and many patients find this situation unsatisfactory. As a consequence, patients

Table 5. Multivariate Regression Analysis to Predict Requests for Information About Integrative Medicine, Using Patients' Characteristics and Tumor Characteristics as Predictors.

Characteristics	Value	OR	95% CI		P
			Lower Limit	Upper Limit	
Age (n)	Per year	0.979	0.963	0.995	.010
Information about antihormonal therapy	Per dissatisfaction grade	1.570	1.001	2.463	.049
Rehabilitation/fitness	No	1 (reference)			
	Yes	1.757	1.301	2.374	<.001
Nutrition	No	1 (reference)			
	Yes	3.006	2.238	4.038	<.001
Medical information from doctors	No	1 (reference)			
	Yes	6.063	4.559	8.064	<.001
Self-help groups	No	1 (reference)			
	Yes	2.041	1.499	2.780	<.001
Other information	No	1 (reference)			
	Yes	1.670	1.208	2.307	.002

Abbreviations: CI, confidence intervals; OR, odds ratio.

often feel confused rather than being well-informed.⁴⁹ More sophisticated patients are often not satisfied with unprofessional information provision and are interested in receiving serious, scientific, and professional information about the effectiveness of tested and evidence-based methods of integrative medicine. They can obtain such information in the first place from competent physicians with experience in oncology who not only have knowledge about the efficacy, indications, application, and effects of complementary therapies, but can also assess potential contraindications and interactions between the cancer treatment currently being provided, the patient's concomitant medication, and integrative medicine. This would potentially ensure the greatest degree of safety.⁵³

This study has several strengths and limitations. One strength is the large number of patients included. However, a substantial number of patients were excluded for various reasons; approximately 32% of the patients were excluded by the study team. Half of them did not complete the questionnaires about their interest in integrative medicine, and this may have led to a selection bias. Women who were not interested in integrative medicine did not answer the question and were consequently excluded, whereas women who were interested in integrative medicine had a more positive attitude and therefore responded to the question. The group not interested in integrative medicine might therefore be even larger than documented. Another bias might arise from the fact that only certified breast cancer centers were allowed to take part in the study. This could possibly lead to a discrepancy from other breast cancer patients who were not treated in certified breast cancer centers and consequently did not receive information about integrative medicine. However, the general interest in integrative medicine shown, at about 46% of those who responded to the

questionnaire on integrative medicine, lies within the range of what other studies have reported. This needs to be borne in mind when interpreting the results.

Conclusions

In conclusion, this study shows that a considerable proportion of postmenopausal breast cancer patients are interested in integrative medicine. The provision of information about integrative medicine should therefore form part of patient care in this group. Offering information about integrative medicine is important, as otherwise the patients often receive unclear and dubious information from other sources such as the Internet, magazines, or television, from which they often receive no advice about risks, complications, or drug safety. The study shows that receiving concomitant medication is one of the main predictive factors for women in this group not being interested in integrative medicine. Special attention to this group of patients and the provision of individual education about integrative medicine may therefore be warranted. Patients who were interested in integrative medicine were also often interested in lifestyle modulation and less satisfied with the information they had received about their therapies. These findings may help physicians in the effort to meet patients' expectations. Most patients were also interested in receiving the information from their own doctor, showing that this responsibility lies with the physicians treating the individual patient. The data show that there is an ongoing need to improve both the infrastructure for patient care and also the provision of information during the process of standard medical care for breast cancer. It is important to enhance the information about integrative medicine provided by the physicians treating the patient and by the team responsible in primary breast

cancer centers, as many patients are interested in integrative medicine.

Appendix

Ethics Committees

1. Ethic committee, Friedrich-Alexander University Erlangen-Nuremberg, 91054 Erlangen, Germany
2. Ethic committee, University Düsseldorf, 40225 Düsseldorf, Germany
3. Ethic committee, University Tübingen, 72076 Tübingen, Germany
4. Ethic committee, Bavarian State Chamber of Physicians, 81675 Munich, Germany
5. Ethic committee, State Chamber of Physicians of North Rhine-Westphalia, 40225 Düsseldorf, Germany
6. Ethic committee, State Chamber of Physicians of Schleswig-Holstein, 23795 Bad Segeberg, Germany
7. Ethic committee, State Chamber of Physicians of Baden-Wuerttemberg, 70597 Stuttgart, Germany
8. Ethic committee, University Cologne, 50931 Cologne, Germany
9. Ethic committee, University Maistraße und Grosshadern Munich, 80337 Munich, Germany
10. Ethic committee, State Chamber of Physicians of Lower Saxony, 30175 Hannover, Germany
11. Ethic committee, State Chamber of Physicians of Saxony, 01099 Dresden, Germany
12. Ethic committee, State Chamber of Physicians of Saarland, 66111 Saarbrücken, Germany
13. Ethic committee, University Ulm, 89075 Ulm, Germany
14. Ethic committee, State Chamber of Physicians of Brandenburg, 03044 Cottbus, Germany
15. Ethic committee, State Chamber of Physicians of Saxony-Anhalt, 39120 Magdeburg, Germany
16. Ethic committee, State Chamber of Physicians of Hesse, 60598 Frankfurt am Main, Germany
17. Ethic committee, University Schleswig-Holstein Kiel, 24105 Kiel, Germany
18. Ethic committee, Technical University Munich, 81675 Munich, Germany

Acknowledgments

We would like to thank the patients and staff involved in the study. We would also like to express our thanks to the participating study centers and to all patients who participated in the study. All analyses were done independently of Novartis. The manuscript was also prepared independently of Novartis. Data sovereignty remains with the principal medical investigators. We acknowledge support by Deutsche Forschungsgemeinschaft and Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) within the funding programme Open Access Publishing.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: PAF carried out research for Novartis and Amgen. KS and AJ are employees of Novartis Pharma. EB carried out research for Novartis, Celgene, BMS, and Roche. MWB is member of the EvAluate-TM study group. All other authors declare that there are no conflicts of interest.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: PAF received honoraria from Amgen, Celgene, Roche, Pfizer, Genomic Health, Novartis, Teva. H-CK received fees from Amgen, Novartis, Teva, Pfizer, Carl Zeiss Meditec, GSK, and Roche. MG received fees from Novartis, AstraZeneca, and Roche. NH received fees from Novartis. RW received fees and research funding from Novartis. NF received fees from Novartis and research funding from Novartis. WJ received fees from Novartis and research funding from Novartis. TK received fees from Novartis. HT received fees from Novartis. CR received fees from Novartis. CMB received fees from Roche. SK received fees from Roche, Celgene, and Novartis. The research was financially supported by Novartis, which enabled us to carry out the study.

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