


Self-reported Improvement in Side Effects and Quality of Life With Integrative Medicine in Breast Cancer Patients

Integrative Cancer Therapies
2018, Vol. 17(3) 941–951
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DOI: 10.1177/1534735418777883
journals.sagepub.com/home/ict


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Abstract

Purpose. Although the demand from patients for integrative medicine is increasing, complementary medicine services are still quite heterogeneous and have not been incorporated into clinical routine. The aim of this study was to systematically evaluate improvements in side effects and quality of life associated with a hospital-based integrative medicine program in the modern breast cancer patient care setting. **Methods.** In a cross-sectional study, integrative health counseling and treatment were evaluated in women with breast cancer. Over a 15-month period, data for 75 patients from an integrative medicine consultancy service with standardized operating procedures were collected at the University Breast Center for Franconia. At baseline, the patients answered a questionnaire on their medical history, symptoms, and the treatment goals they were hoping to achieve with integrative medicine. In the follow-up, patient-reported outcomes related to side effects of conventional cancer treatment and patients' quality of life were analyzed. **Results.** Among 60 patients with the therapy goal of reducing the side effects of conventional treatment, 46 (76.7%) were successful. Among 57 patients hoping to improve disease-related quality of life, 46 (82%) reported success. Whereas patients with metastatic disease achieved a reduction in the side effects of conventional therapy, quality-of-life improvements were predominantly achieved by patients with a good treatment prognosis. **Conclusions.** Breast cancer patients benefit from the counseling and treatment provided with integrative medicine in all phases of tumor disease. Integrative treatment services should be included as part of patient care in clinical routine work to offer patients the maximum quality of care and safety with complementary therapies.

Keywords

integrative medicine, complementary and alternative medicine, breast cancer, oncology, patient care, side effect management, quality of life

Submitted: October 7, 2017; revised: April 5, 2018; accepted: April 9, 2018

Introduction

The prognosis for patients with breast cancer has clearly improved over the past few years. With the increasing number of breast cancer survivors, attention is now turning to the side effects and possible sequelae of cancer therapies and patients' quality of life. Cancer treatments are often associated with side effects and a reduction in the quality of life, creating an additional burden for patients.¹⁻¹¹

These may be some of the reasons why increasing numbers of breast cancer patients nowadays wish to make use of complementary methods as supportive measures in cancer therapy.^{12,13} In the United States, Australia, and Europe,

38% to 60% of all cancer patients use complementary and alternative medicine (CAM) for therapeutic support during

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the course of their disease.^{12,14} The percentage is even higher in breast cancer patients, among whom—depending on the cancer stage—it can be as high as 90%.^{15,16} The main motivations for CAM use are to alleviate therapy-induced toxicity, to have an opportunity to become actively involved in the therapy, to improve physical health, and to increase the chances of curing the cancer. Studies have confirmed that an integrative approach can help reduce the side effects of modern cancer therapies as well as cancer symptoms.¹⁷⁻²¹ There is good evidence for the efficacy of mind-body medicine and healthy nutrition and physical training, especially endurance training, in the treatment of breast cancer patients.²²⁻²⁷ Witt et al²⁸ define integrative medicine in oncology to be “a patient-centered, evidence-informed field of cancer care that utilizes mind and body practices, natural products, and/or lifestyle modifications from different traditions alongside conventional cancer treatments. Integrative oncology aims to optimize health, quality of life, and clinical outcomes across the cancer care continuum and to empower people to prevent cancer and become active participants before, during, and beyond cancer treatment.” 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.”²⁹ 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.³⁰ It has also been reported that CAM can improve patients’ quality of life.^{15,31,32}

In particular, this study includes naturopathic therapies from the European tradition in patients’ treatment as part of integrative medicine. Naturopathy is a whole medical system with a deep European history of traditional philosophies and practices.³³ From a medical point of view, naturopathic medicine refers to all naturopathic treatments that focus on prevention, treatment, and optimal health through the use of therapeutic methods and substances that encourage individuals’ inherent self-healing process.³⁴ The classic naturopathic treatments—namely, balanced lifestyle, hydrotherapy, exercise therapy, phytotherapy and nutrition—were of particular importance in this analysis.³⁵

A recent analysis showed that most patients were interested in obtaining the relevant information from the physician treating them.³⁶ However, the information sources about CAM used by patients are at present still very diverse, including not only health care professionals and CAM providers, but also print and mass media, family and friends, the internet, self-help groups, and health-insurance companies. In addition, patients often do not discuss the use of CAM with their oncologist because breast cancer hospitals and departments do not have any infrastructure available

for integrative medicine.³⁷⁻⁴⁴ This lack of communication poses a potential hazard because it might lead to drug interactions or even noncompliance.

Integrative counseling and therapeutic options are only very rarely available in medical facilities in Germany and are currently limited to a few selected breast cancer centers in which staff members with appropriate training in the field of integrative medicine are present. These services are essentially very heterogeneous and nonstandardized.

The published data on the effectiveness and objectives of integrative medicine are still insufficient. Most of the information derives from studies that include heterogeneous groups of cancer patients in settings outside of routine clinical patient care. It is, therefore, necessary to focus specifically on the patients’ needs and to collect more data on improvements in side effects and in quality of life in breast cancer patients in a standardized setting.

The aim of the present study was to assess patients’ adherence to integrative medicine recommendations developed through a standardized process as well as to evaluate the self-reported improvement in side effects and quality of life by integrative medicine in breast cancer patients. In addition, the question of which patient groups benefit most from the use of integrative medicine was explored.

Methods

Patients and Description of Study

This retrospective, single-center, cross-sectional study was conducted in the Department of Gynecology and Obstetrics at Erlangen University Hospital. Recruitment started in January 2016, and the last patient was included on March 28, 2017. Patients were included if they had a diagnosis of breast cancer and had sought medical advice regarding integrative medicine. All the patients also received standard conventional treatment for their carcinomas.

At admission, the patients were asked to complete our previously published validated and standardized questionnaire (IMed questionnaire) to provide their medical information, lifestyle information, interest in complementary and alternative therapies, details of their physical and mental state, and individual goals in relation to integrative medicine.^{45,46}

In accordance with internal standard operating procedures, an individual treatment plan that included all traditional European naturopathic medicines—namely, lifestyle regulation therapy, exercise therapy, hydrotherapy, phytotherapy, and general healthy nutritional therapy—was developed for each patient in an interdisciplinary conference for integrative medicine composed of gynecologists, naturopathic physicians, physiotherapists, psychooncologists, internal specialists, and nutrition experts. The

detailed standard operating procedure of the integrative medicine consultation service are described in a previous work.⁴⁵ During a second visit, the treatment plan was introduced to the patient, and all therapy recommendations were thoroughly discussed. The patients were asked to implement the treatment plan at their own responsibility. It was not necessary for patients to comply with all therapy recommendations.

A one-time follow-up interview was conducted with patients who had received their treatment plans at least 2 months previously. Our retrospective study was based on this interview. The patients were contacted by a member of the study team by telephone or during their next appointment at the hospital.⁴⁶ The interview included standardized questions on treatment compliance, physical state, therapy goals, improvement in side effects, self-reported quality of life, and general satisfaction with the integrative medicine consultancy service (see the follow-up questionnaire in the online appendix, available at <http://journals.sagepub.com/home/ict/supplemental-data>).

All consultants of the integrative medicine service are gynecologists and specialists in the field of integrative medicine, with long-standing experience and expertise. They have completed an additional qualification for naturopathy and a special curriculum that includes a specified education regarding integrative medicine and complementary therapies, practical work, and an exam at the regional State Medical Association.

The study protocol was in accordance with the Declaration of Helsinki and was approved by the ethics review committee Friedrich Alexander University of Erlangen-Nuremberg (Study Protocol Number: 255_16 B). Written informed consent was obtained from all.

Outcome Measures and Statistical Considerations

Data on patient and tumor characteristics were collected from the clinical records. Information on the patients' expectations regarding integrative medicine was taken from the IMed questionnaire.

During the interview, patients were asked if they were currently applying the individual treatment recommendations or, if not, for how long they did implement them. If patients were currently carrying out the treatments, or if they had used them for at least 4 weeks, this was assessed as being adherent to the treatment plan. Only patients who had received the individual recommendation in their treatment plan were included in this analysis.

Success in achieving individual therapy goals was assessed using standardized questions in which patients had to assign grades from 1 (*extremely satisfied*) to 6 (*very unsatisfied*). "I don't know" responses were excluded from

the data. If patients assigned 2 grades, all calculations were done with the poorer grade.

For further analysis, patients were considered to have fully reached their individual therapy goals if they answered 1 (*very satisfied*) or 2 (*satisfied*) or were considered partially successful in achieving their therapy goals if they answered 3 (*partly satisfied*) or 4 (*partly dissatisfied*). Factors influencing the achievement of reduced side effects of conventional tumor treatment and improvement in quality of life were investigated.

Improvement in symptoms since the initial integrative medicine consultation was measured using 7 grades ("Yes, the symptom stopped," "Yes, significant improvement," "Yes, slight improvement," "No, unchanged," "No, slight deterioration," "No, significant deterioration," and "I don't know").

Evaluation was performed using descriptive analyses. The Kruskal-Wallis test was used to test for significance between the ratings of reduction of side effects/improvement of disease-related quality of life and state of disease and course of disease, respectively. Spearman's rank correlation was used to test for significance between the ratings of reduction of side effects/improvement of disease-related quality of life and continuous data—here, age. Missing data were excluded from the analysis. The software program R (version 3.3.2; <http://www.r-project.org>) was used for statistical analyses. A *P* value < .05 was considered statistically significant.

Results

Patient Characteristics

Since the initiation of the integrative medicine consultancy service in the Department of Gynecology and Obstetrics at Erlangen University Hospital, a total of 106 patients have attended it. Of 91 patients who met the inclusion criteria, 10 patients had died before a follow-up interview could be conducted. Data could not be collected for a further 6 patients. In all, 75 patients who answered the IMed questionnaire and also the follow-up questionnaire were included in the final analysis. Younger patients with a recent diagnosis of breast cancer who were undergoing chemotherapy made particularly frequent use of the integrative medicine advice service.

The patients' demographic data and baseline characteristics are shown in Table 1. Apart from 1 patient who completely declined conventional treatment, all the patients received standard, conventional therapy. The patients' mean age at study entry was 52.5 ± 12.1 years.

The periods between the initial visit to the integrative medicine advice service and the follow-up interview ranged from 8 weeks to 142 weeks (mean 65.5 ± 45.1 weeks). During this period, 54.7% of patients had a change in their conventional cancer medication ($n = 41$).

Table 1. Characteristics of the Patients (n = 75), Showing Absolute Numbers, Percentages, and Means.^a

Characteristics	n	Percentage	Mean (SD)
Age at baseline (years)			52.5 (12.1)
≥40	13	17.3	
41-60	43	57.3	
>60	19	25.3	
Disease state at baseline			
Neoadjuvant	24	32.0	
Adjuvant	36	48.0	
Palliative	15	20.0	
Cancer treatment at baseline			
Chemotherapy	38	50.7	
EC + Paclitaxel	19	25.3	
Carboplatin + Paclitaxel	8	10.7	
Eribulin	5	6.7	
Other	6	8.0	
Endocrine therapy	18	24.0	
Letrozole	8	10.7	
Exemestane	4	5.3	
Tamoxifen	4	5.3	
Other	2	2.7	
Targeted therapy	13	17.3	
Trastuzumab	3	4.0	
Pertuzumab + Trastuzumab	4	5.3	
Other	6	8.0	
Bisphosphonates	11	14.7	
No systemic therapy	17	22.7	
Disease state at follow-up			
Palliative, progression of tumor disease	7	9.3	
Palliative, stable disease	8	10.7	
Curative, current chemotherapy or targeted therapy (neoadjuvant/adjuvant)	19	25.3	
Curative, aftercare, endocrine therapy, or bisphosphonates	40	53.3	
Disease state unknown	1	1.3	

Abbreviation: EC, epirubicin and cyclophosphamide.

^aMultiple responses regarding cancer treatments were allowed.

Therapy Compliance

The treatment plans included recommendations from all the classic disciplines of traditional European naturopathic medicine, which were complemented with extended European naturopathic treatments such as enzyme therapy, microbiological therapy, micronutrient therapy, and mind-body-based medicine if feasible. The most common therapy recommendations (Table 2) consisted of a well-structured daily routine as well as nutritional counseling (n = 72, 96%), relaxation techniques (n = 71, 94.7%), regular walking (n = 69, 92.0%), enzyme therapy (n = 66, 88.0%), cold facial affusions (n = 61, 81.3%), mild endurance training (n = 54, 72.0%), and oil swishing (n = 51, 68.0%). The mean number of recommendations per patient was 21 ± 6. Patients stated that they were still adhering to the full treatment plan

after 4 weeks at a rate of 65.1% ± 14.0%. Compliance with the 20 most recommended individual treatments was assessed. The results are summarized in Table 2.

Achievement of Therapy Goals

In the baseline questionnaire, patients were asked about the individual goals of treatment that they wanted to achieve by using integrative medicine. The most common goals reported were delaying tumor progression (n = 64, 85.3%); reducing the side effects of conventional therapy (n = 60, 80.0%); stabilizing body, mind, and spirit (n = 58, 77.3%); actively participating in treatment of the cancer (n = 54, 72%); and improving the disease-related quality of life (n = 53, 70.7%). Self-reported achievement of therapy goals is summarized in Table 3.

Table 2. Integrative Medicine Recommendations in the Consultations at Baseline, and Adherence to Individual Treatment Recommendations for at Least 4 Weeks, Evaluated in the Follow-up Interview.^a

Treatment Recommendation	Patients Who Received Recommendation (n = 75)		Patients Stating at Least 4 Weeks' Adherence	
	n	Percentage	n	Percentage
General healthy nutritional therapy	72	96.0	65	90.3
Well-structured daily routine	72	96.0	61	84.7
Relaxation techniques	71	94.7	53	74.6
Regular walking	69	92.0	58	84.1
Enzyme therapy	66	88.0	50	75.8
Cold facial affusions	61	81.3	35	57.4
Mild endurance training	54	72.0	35	64.8
Oil swishing	51	68.0	20	39.2
Mild outdoor activities	48	64.0	43	89.6
IMed infusions ^b	33	44.0	14	42.4
L-Carnitine	31	41.3	15	48.4
Vitamin D	31	41.3	30	96.8
Vitamin B complex	29	38.7	26	89.7
Applying stimuli to hands and feet	28	37.3	24	85.7
Moist, hot hay flower sachet	27	36.0	5	18.5
Peeling with olive oil and sugar	26	34.7	12	46.2
Psychological support	26	34.7	14	53.8
Relaxing baths	22	29.3	13	59.1
Iberogast (herbal mixture)	21	28.0	13	61.9
Iceland moss (<i>Cetraria islandica</i>)	20	26.7	16	80.0

Abbreviation: IMed, integrative medicine.

^aMultiple recommendations and responses were possible. Only patients who had received each recommendation were included in the analysis of compliance.

^bIMed infusions: intravenous vitamin infusions containing various vitamins (vitamin C, vitamin B1, vitamin B6, vitamin B12) and some minerals (magnesium and calcium) that were produced by the pharmacy of the University Hospital Erlangen on application day in a standardized way and applied in the Department of Gynecology and Obstetrics within the scope of the integrative treatment.

The items “reduction of side effects of conventional therapy” and “improvement of disease-related quality of life” were included in further analyses to assess factors potentially influencing the achievement of these goals. It was investigated whether the reduction in the side effects of conventional therapy and the improvement in the disease-related quality of life were dependent on age, disease state, and progression of cancer. The results are summarized in Tables 4 and 5.

The ratings for the reduction of side effects differed significantly relative to the patients' treatment state ($P = .022$). For quality of life, the ratings differed significantly depending on the patients' course of disease ($P = .026$).

Reduction in Side Effects of Conventional Cancer Treatment

A total of 54 different symptoms—most of them side effects of cancer or of conventional tumor therapies—were reported by patients at the beginning of integrative therapy. By far, the largest number of patients reported tiredness/

lack of motivation/fatigue ($n = 51, 68.0\%$), followed by depressive mood ($n = 26, 34.7\%$), impaired cognitive function ($n = 22, 29.3\%$), climacteric symptoms and hot flushes ($n = 20, 26.7\%$), and polyneuropathy ($n = 18, 24\%$). Climacteric symptoms/hot flushes, polyneuropathy, bone pain, back pain, sleep disturbances, constipation, and dysgeusia were also frequently reported. Table 6 provides a summary of self-reported reductions in symptoms experienced by the patients.

Discussion

Although breast cancer patients use CAM therapies particularly often, at a rate of up to 90%, there is still only a small amount of information available on the potential benefits of the integrative care approach in the clinical setting.^{14,47} To the best of the authors' knowledge, the present study is the first to focus exclusively on breast cancer patients who participated in an integrative therapy program based on standardized operating procedures that are incorporated into routine clinical work with patients in a hospital setting. The

Table 3. Achievement of Individual Treatment Goals, as Evaluated by Patients at the Follow-up Interview, Showing the Numbers of Patients Who Stated Each Therapy Goal: Percentages and Median.^a

Treatment Goal	Patients								Median
	Stating Goal at Baseline, n (%)	Extremely Satisfied, n (%)	Very Satisfied, n (%)	Satisfied, n (%)	Adequate, n (%)	Dissatisfied, n (%)	Very Dissatisfied, n (%)	Don't Know, n (%)	
Relief of cancer symptoms	33 (44.0)	1 (3.0)	13 (39.4)	9 (27.3)	1 (3.0)	0 (0.0)	1 (3.0)	8 (24.2)	2
Reduction of side effects of conventional therapy	60 (80.0)	2 (3.3)	24 (40.0)	19 (31.7)	1 (1.7)	0 (0.0)	2 (3.3)	12 (20.0)	2
Improvement in disease-related quality of life	56 (74.7)	7 (12.5)	19 (33.9)	18 (32.1)	2 (3.6)	1 (1.8)	1 (1.8)	8 (14.3)	2
Improvement in coping with disease	42 (56.0)	2 (4.7)	17 (40.5)	12 (28.6)	2 (4.7)	1 (2.4)	2 (4.7)	6 (14.3)	2
Stabilization of body, mind, and spirit	59 (73.3)	3 (5.1)	21 (35.6)	23 (39.0)	6 (10.2)	1 (1.7)	2 (3.4)	3 (5.1)	3
Active participation in treatment of the disease	56 (74.7)	17 (30.4)	24 (42.9)	9 (16.1)	1 (1.8)	0 (0.0)	1 (1.8)	4 (7.1)	2
Slowing of tumor progression	64 (85.3)	8 (12.5)	6 (9.4)	2 (3.1)	0 (0.0)	0 (0.0)	2 (3.1)	46 (71.9)	2
Prolonging survival time	51 (68.0)	4 (7.8)	1 (2.0)	4 (7.8)	0 (0.0)	0 (0.0)	2 (3.9)	40 (78.4)	3

^aAt the follow-up interview, the patients were asked how satisfied they were with the extent to which their treatment goals had been achieved (1, extremely satisfied; 2, very satisfied; 3, satisfied; 4, adequate; 5, dissatisfied; 6, very dissatisfied; don't know). Of the 75 patients enrolled, only the patients who stated each treatment goal at the baseline were included in the analysis of the achievement of individual therapy goals.

Table 4. Reduction in the Side Effects of Conventional Therapy.^a

	Reduction in Side Effects of Conventional Therapies			P
	Achieved, n (%)	Partly Achieved, n (%)	Not Achieved, n (%)	
Age (years)				.586 ^b
≥40	4 (44%)	4 (44%)	1 (11%)	
41-60	17 (59%)	11 (38%)	1 (3%)	
≥60	5 (50%)	5 (50%)	0 (0%)	
Treatment state at initial presentation				.022 ^c
Neoadjuvant	12 (67%)	5 (28%)	1 (6%)	
Adjuvant	6 (30%)	13 (65%)	1 (5%)	
Palliative	8 (80%)	2 (20%)	0 (0%)	
Course of disease				.102 ^c
Palliative, progression	2 (40%)	2 (40%)	1 (1%)	
Palliative, stable disease	5 (100%)	0 (0%)	0 (0%)	
Curative, current chemotherapy, or targeted therapy	7 (58%)	5 (42%)	0 (0%)	
Curative, aftercare, endocrine therapy, or bisphosphonates	12 (46%)	13 (50%)	1 (4%)	

^aOnly patients who stated this goal at baseline were included in the analysis (achieved = rated at 1 + 2; partly achieved = rated at 3 + 4; not achieved = rated at 5 + 6).

^bSpearman's rank correlation.

^cKruskal-Wallis Test.

Table 5. Improvement in Quality of Life.^a

	Improvement in Quality of Life			P
	Achieved, n (%)	Partly Achieved, n (%)	Not Achieved, n (%)	
Age (years)				.586 ^b
≥40	7 (78%)	1 (11%)	1 (11%)	
41-60	15 (58)	10 (38%)	1 (4%)	
≥60	4 (31%)	9 (69%)	0 (0%)	
Treatment state at initial presentation				.746 ^c
Neoadjuvant	10 (59%)	7 (41%)	0 (0%)	
Adjuvant	11 (55%)	7 (35%)	2 (10%)	
Palliative	5 (45%)	6 (55%)	0 (0%)	
Course of disease				.026 ^c
Palliative, progression	1 (17%)	5 (83%)	0 (0%)	
Palliative, stable disease	5 (100%)	0 (0%)	0 (0%)	
Curative, current chemotherapy, or targeted therapy	8 (62%)	5 (38%)	0 (0%)	
Curative, aftercare, endocrine therapy, or bisphosphonates	12 (50%)	10 (42%)	2 (8%)	

^aOnly patients who stated this goal at baseline were included in the analysis (achieved = rated at 1 + 2; partly achieved = rated at 3 + 4; not achieved = rated at 5 + 6).

^bSpearman's rank correlation.

^cKruskal-Wallis Test.

major treatment goals for breast cancer patients who made use of the integrative medicine advice service were to achieve an improvement in their disease-related quality of life and a reduction in the side effects associated with cancer treatment; they described this as having been well achieved or very well achieved using the integrated approach. Success in improving quality of life was associated with a curative treatment situation; patients with metastatic disease reported a reduction in the side effects of conventional cancer therapy.

The treatment plans that the patients received were very comprehensive, with a mean of 21 separate recommendations per patient, and included lifestyle interventions as well as treatments for specific symptoms or side effects of therapy. In the integrative medicine service, evidence-based integrative therapies^{23,25,27,48} as well as effective integrative methods with experience-based efficacy^{49,50} and tradition were used.⁵¹⁻⁵³ The overall treatment compliance was very good after 4 weeks. Only integrative therapies with higher expenditure of time or amount of work and lower acceptance showed somewhat lower compliance (eg, oil swishing, hot hay flower sachet, peeling with olive oil and sugar). Integrative therapies are usually long-term forms of treatment, and lifestyle interventions often need some time until they can be sufficiently implemented by patients.^{48,54} The 4-week time interval was chosen because it was hypothesized to be a long enough duration for patients to experience treatment effects of integrative medicine because it is known that many integrative treatments only become effective after some treatment time.⁵¹ At the same time, it was

still possible to assess compliance with integrative procedures that were used to treat short-term symptoms.

The present study examined whether patients experienced an improved quality of life as a result of the full counseling provided by the integrative medicine consultancy service. The majority of patients stated that they were able to achieve this treatment goal extremely well or very well. This finding is in accordance with a randomized trial in which breast cancer patients received either multicomponent complementary treatment or usual care alone. After 3 and 6 months of treatment, the women reported a good level of achievement of previously set individual therapy goals and an improvement in their quality of life.⁴⁷ Our study shows that improvement of quality of life is associated with a curative treatment situation and good prognosis. Patients who suffered tumor progression achieved the treatment goal to a noticeably lesser extent.

One of the most frequently reported reasons for using integrative medicine is to try to reduce the side effects of conventional therapies, and this was also the treatment goal most commonly reported by patients in the present study.^{39,55,56} When asked about specific symptoms, most patients state that integrative medicine leads to improvements that are slight or moderate. However, a large proportion of patients still feel that there is no change in the symptoms concerned. In particular, control of decline in cognitive function, depressive mood, and musculoskeletal pain still require significant improvement, whereas tiredness and fatigue, as well as gastrointestinal symptoms, can usually be well controlled with integrative medicine.

Table 6. Self-reported Reduction in Symptoms Associated With Integrative Medicine, as Evaluated in the Follow-up Interview.^a

No.	Symptom	Patients (n = 75), n (%)	Yes, Symptom Stopped, n (%)	Yes, Symptom Significantly Improved, n (%)	Yes, Symptom Improved Slightly, n (%)	No, Symptom Unchanged, n (%)	No, Symptom Slightly Worse, n (%)	No, Symptom Significantly Worse, n (%)	Don't Know, n (%)	No Response, n (%)
1	Tiredness/fatigue/ lack of motivation	51 (68.0)	2 (3.9)	11 (21.6)	21 (41.2)	14 (27.5)	0 (0.0)	2 (3.9)	1 (2.0)	0 (0.0)
2	Depressive mood	26 (34.7)	2 (7.7)	6 (23.1)	8 (30.8)	10 (38.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
3	Impaired cognitive function	22 (29.3)	1 (4.6)	6 (27.3)	6 (27.3)	9 (40.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
4	Climacteric complaints/hot flushes	20 (26.7)	4 (20.0)	6 (30.0)	4 (20.0)	1 (5.0)	0 (0.0)	1 (5.0)	3 (15.0)	1 (5.0)
5	Polyneuropathy	18 (24.0)	2 (11.1)	5 (27.8)	4 (22.2)	3 (16.7)	1 (5.6)	2 (11.1)	1 (5.6)	0 (0.0)
6	Bone pain	17 (22.7)	1 (5.9)	3 (17.7)	3 (17.7)	5 (29.4)	0 (0.0)	1 (5.9)	1 (5.9)	3 (17.7)
7	Sleep disturbances	16 (21.3)	1 (6.3)	3 (18.6)	6 (37.5)	4 (25.0)	1 (6.3)	0 (0.0)	1 (6.3)	0 (0.0)
8	Back pain	15 (20.0)	1 (6.7)	1 (6.7)	5 (33.3)	6 (40.0)	2 (13.3)	0 (0.0)	0 (0.0)	0 (0.0)
9	Constipation	14 (18.7)	6 (42.9)	6 (42.9)	2 (14.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
10	Dysgeusia	14 (18.7)	4 (28.6)	1 (7.1)	2 (14.3)	4 (28.6)	1 (7.1)	0 (0.0)	0 (0.0)	2 (14.3)

^aThe analysis was limited to the top 10 symptoms most frequently stated by the patients. Multiple responses were allowed. Among the 75 patients enrolled, only the patients who stated the relevant symptoms at baseline were included in the analysis of the reduction in particular symptoms.

Overall, more than half of the patients included in the present study stated that a reduction in side effects had been achieved. Reductions in side effects were associated with metastatic disease at baseline. A possible explanation is that treatment for metastatic disease usually involves long-term chemotherapy, which can continuously entail unwanted side effects. Integrative medicine appears to be a suitable option for helping patients in this situation.

The present study has several strengths and limitations. It should be noted that it was a retrospective, single-center cross-sectional study that included a clearly defined, homogeneous group of patients. However, the number of participants was very small, at only 75. Hence, only a few patients could be included in the respective subgroups. Among 91 patients who initially met the inclusion criteria, a follow-up interview could not be conducted in 16 patients, resulting in a very high response rate overall. Because the analysis was conducted exclusively in the setting of the integrative medicine consultancy service, there was no control group. However, the study revealed several interesting aspects that will require further analysis in comparison with patients who are not receiving integrative care.

The integrative medicine consultancy service forms part of a specialized breast cancer center at a university hospital, so that there may have been potential bias in relation to the study population. However, the service was open to all patients, regardless of where they were receiving cancer treatment, and a few outside patients also made use of the service.

Satisfaction, quality of life, and treatment effects were analyzed using self-reported outcomes in patient follow-up interviews. Validated questionnaires such as the FACT-B or distress thermometer were not used in this study. The major reason for this is that these questionnaires are not suitable to get answers to the questions of adherence to the integrative program and satisfaction of breast cancer patients who were treated with an integrative approach. In addition, the patient follow-up was mainly carried out by phone, and the intention was to take up as little of the patients' time as possible and minimize inconvenience for them. For similar reasons, strict follow-up appointments at specific dates were not set for the patients, who are usually seen regularly and over a long period of time in our care, leading to a wide time range between the baseline assessment and the follow-up. Another limitation was the large variance of the follow-up periods in the retrospective study design. This retrospective analysis should be followed up with a prospective design in another study in which patients are interviewed at the same specific follow-up date with validated instruments.

The study also has a variety of strengths, however. Very few data are available regarding quality of life and reduction of side effects in homogeneous groups of cancer patients. This study concentrated specifically on breast cancer patients because they are reported to be among the most frequent users of complementary therapy.^{14,57} Data were acquired using only standardized questionnaires at the

baseline and follow-up visits. The rating scales used in the follow-up questionnaire were based on school grades. This was meant to make it as easy as possible for the patients to answer the questionnaire because this grading system is familiar for them. Direct communication with the patients in the follow-up interviews also ensured that the patients understood all the questions correctly and answered the questionnaire in full, providing high-quality data.

The hospital's integrative medicine consultancy service is unique because it is at present the only service that follows a standardized and validated procedure leading to the treatment recommendations of integrative medicine. The patients have an opportunity to receive integrative treatment from an oncologist who also has specialist training in naturopathy.⁴⁵ All the integrative treatment recommendations are documented carefully in the medical record, ensuring that the cancer treatment genuinely goes hand in hand with integrative medicine, providing a high level of treatment safety.

Conclusions

This study shows that integrative medicine can contribute to a reduction in the side effects of conventional cancer treatments and can help patients improve their subjective quality of life. It, therefore, appears reasonable to offer an integrative approach as part of standard patient care. The coordination of integrative medicine with conventional cancer treatment and the implementation of standardized procedures would ensure that patient care can be provided at maximum quality standards, with the highest standard of information and with maximum treatment safety. In future research, it would also be of interest to compare the quality of life with and without integrative care in women at different stages of disease.

This is one of the first studies to carry out a systematic evaluation of patients' adherence to a naturopathic program integrated into a hospital breast cancer service by standardized operating procedures. The findings are intriguing but must be confirmed in further studies with prospective design and larger numbers of patients.

Acknowledgment

We would like to thank the staff involved in the study and all patients who participated in the study. The contribution of S. Dietzel-Drentwett to this publication was made in partial fulfillment of the requirements for obtaining the doctoral degree "Dr Med." The contribution of A.-K. Theuser to this publication was made in partial fulfillment of the requirements for obtaining the doctoral degree "Dr Rer Biol Hum." Parts of the research published here have been used for their doctoral theses in the Medical Faculty of Friedrich Alexander University of Erlangen-Nuremberg (FAU).

Authors' Note

CCH, AKT, and MWB contributed to the conception of the current analysis, and all authors were involved in the design and acquisition

of data from the study. AKT and JS performed the statistical analysis. CCH, AKT, SD-D, and PAF contributed to the analysis and interpretation of data. CCH and AKT drafted the manuscript, and all authors revised the final draft critically for important critical content. All authors have given final approval of the version to be published.


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. 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, and Teva.

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References

- Redden MH, Fuhrman GM. Neoadjuvant chemotherapy in the treatment of breast cancer. *Surg Clin North Am*. 2013;93:493-499.
- Schmidt M. Chemotherapy in early breast cancer: when, how and which one? *Breast Care (Basel)*. 2014;9:154-160.
- Burstein HJ, Temin S, Anderson H, et al. Adjuvant endocrine therapy for women with hormone receptor-positive breast cancer: American Society of Clinical Oncology clinical practice guideline focused update. *J Clin Oncol*. 2014;32:2255-2269.
- Goldhirsch A, Winer EP, Coates AS, et al; Panel Members. Personalizing the treatment of women with early breast cancer: highlights of the St Gallen International Expert Consensus on the Primary Therapy of Early Breast Cancer 2013. *Ann Oncol*. 2013;24:2206-2223.
- Penttinen HM, Saarto T, Kellokumpu-Lehtinen P, et al. Quality of life and physical performance and activity of breast cancer patients after adjuvant treatments. *Psychooncology*. 2011;20:1211-1220.
- Odle TG. Adverse effects of breast cancer treatment. *Radiol Technol*. 2014;85:297M-323M.
- Buijs C, de Vries EG, Mourits MJ, Willemse PH. The influence of endocrine treatments for breast cancer on health-related quality of life. *Cancer Treat Rev*. 2008;34:640-655.
- Bani HA, Fasching PA, Lux MM, et al. Lymphedema in breast cancer survivors: assessment and information provision in a specialized breast unit. *Patient Educ Couns*. 2007;66:311-318.
- Bani MR, Beckmann K, Engel J, et al. Correlates of the desire for improved cosmetic results after breast-conserving therapy and mastectomy in breast cancer patients. *Breast*. 2008;17:640-645.
- Jud SM, Fasching PA, Maihofner C, et al. Pain perception and detailed visual pain mapping in breast cancer survivors. *Breast Cancer Res Treat*. 2010;119:105-110.
- Jud SM, Hatko R, Maihofner C, et al. Comprehensive visualization of paresthesia in breast cancer survivors. *Arch Gynecol Obstet*. 2014;290:135-141.
- Horneber M, Bueschel G, Dennert G, Less D, Ritter E, Zwahlen M. How many cancer patients use complementary and alternative medicine: a systematic review and meta-analysis. *Integr Cancer Ther*. 2012;11:187-203.
- Molassiotis A, Browall M, Milovics L, Panteli V, Patiraki E, Fernandez-Ortega P. Complementary and alternative medicine use in patients with gynecological cancers in Europe. *Int J Gynecol Cancer*. 2006;16(suppl 1):219-224.
- Münstedt K, Kirsch K, Milch W, Sachse S, Vahrson H. Unconventional cancer therapy—survey of patients with gynaecological malignancy. *Arch Gynecol Obstet*. 1996;258:81-88.
- Molassiotis A, Scott JA, Kearney N, et al. Complementary and alternative medicine use in breast cancer patients in Europe. *Support Care Cancer*. 2006;14:260-267.
- DiGianni LM, Garber JE, Winer EP. Complementary and alternative medicine use among women with breast cancer. *J Clin Oncol*. 2002;20(18, suppl):34S-38S.
- Blaes AH, Kreitzer MJ, Torkelson C, Haddad T. Nonpharmacologic complementary therapies in symptom management for breast cancer survivors. *Semin Oncol*. 2011;38:394-402.
- Casla S, Hojman P, Márquez-Rodas I, et al. Running away from side effects: physical exercise as a complementary intervention for breast cancer patients. *Clin Transl Oncol*. 2015;17:180-196.
- Finnegan-John J, Molassiotis A, Richardson A, Ream E. A systematic review of complementary and alternative medicine interventions for the management of cancer-related fatigue. *Integr Cancer Ther*. 2013;12:276-290.
- Mansky PJ, Wallerstedt DB. Complementary medicine in palliative care and cancer symptom management. *Cancer J*. 2006;12:425-431.
- Deng G, Cassileth BR. Integrative oncology: complementary therapies for pain, anxiety, and mood disturbance. *CA Cancer J Clin*. 2005;55:109-116.
- Greenlee H, DuPont-Reyes MJ, Balneaves LG, et al. Clinical practice guidelines on the evidence-based use of integrative therapies during and after breast cancer treatment. *CA Cancer J Clin*. 2017;67:194-232.
- Zainal NZ, Booth S, Huppert FA. The efficacy of mindfulness-based stress reduction on mental health of breast cancer patients: a meta-analysis. *Psychooncology*. 2013;22:1457-1465.
- Cramer H, Lauche R, Paul A, Dobos G. Mindfulness-based stress reduction for breast cancer—a systematic review and meta-analysis. *Curr Oncol*. 2012;19:e343-e352.
- Ibrahim EM, Al-Homaidh A. Physical activity and survival after breast cancer diagnosis: meta-analysis of published studies. *Med Oncol*. 2011;28:753-765.
- Pierce JP, Stefanick ML, Flatt SW, et al. Greater survival after breast cancer in physically active women with high vegetable-fruit intake regardless of obesity. *J Clin Oncol*. 2007;25:2345-2351.
- Scott E, Daley AJ, Doll H, et al. Effects of an exercise and hypocaloric healthy eating program on biomarkers associated with long-term prognosis after early-stage breast cancer: a randomized controlled trial. *Cancer Causes Control*. 2013;24:181-191.

28. Witt CM, Balneaves LG, Cardoso MJ, et al. A comprehensive definition for integrative oncology [published online November 1, 2017]. *J Natl Cancer Inst Monogr*. 2017;52. doi:10.1093/jncimonographs/igx012
29. Academic Consortium for Integrative Medicine & Health. Home page. <https://www.imconsortium.org/about/about-us.cfm>. Accessed April 2, 2018.
30. The Bravewell Collaborative™. Integrative medicine. http://www.bravewell.org/integrative_medicine/. Accessed April 2, 2018.
31. Fasching PA, Thiel F, Nicolaisen-Murmann K, et al. Association of complementary methods with quality of life and life satisfaction in patients with gynecologic and breast malignancies. *Support Care Cancer*. 2007;15:1277-1284.
32. Shneerson C, Taskila T, Gale N, Greenfield S, Chen YF. The effect of complementary and alternative medicine on the quality of life of cancer survivors: a systematic review and meta-analyses. *Complement Ther Med*. 2013;21:417-429.
33. Hack CC, Hüttner NBM, Paepke D, et al. Integrative medicine in gynecologic oncology—possibilities and limits: part 1 [in German]. *Senologie*. 2014;11:217-226.
34. Paepke D, Hack CC, Hüttner NBM, et al. Integrative medicine in gynecologic oncology—possibilities and limits. Part 2 [in German]. *Senologie*. 2015;12:45-55.
35. Hüttner NBM, Hack CC, Hackl J, et al. Classical naturopathic therapies of Kneipp in gynecology and obstetrics. *Frauenheilkd up2date*. 2014;8:95-113.
36. Hack CC, Fasching PA, Fehm T, et al. Interest in integrative medicine among postmenopausal hormone receptor-positive breast cancer patients in the EvAluate-TM study. *Integr Cancer Ther*. 2017;16:165-175.
37. Paul M, Davey B, Senf B, et al. Patients with advanced cancer and their usage of complementary and alternative medicine. *J Cancer Res Clin Oncol*. 2013;139:1515-1522.
38. Wanchai A, Armer JM, Stewart BR. Complementary and alternative medicine use among women with breast cancer: a systematic review. *Clin J Oncol Nurs*. 2010;14:E45-E55.
39. Tautz E, Momm F, Hasenburg A, Guethlin C. Use of complementary and alternative medicine in breast cancer patients and their experiences: a cross-sectional study. *Eur J Cancer*. 2012;48:3133-3139.
40. Huebner J, Rose C, Geissler J, et al. Integrating cancer patients' perspectives into treatment decisions and treatment evaluation using patient-reported outcomes—a concept paper. *Eur J Cancer Care (Engl)*. 2014;23:173-179.
41. Huebner J, Muenstedt K, Prott FJ, et al. Online survey of patients with breast cancer on complementary and alternative medicine. *Breast Care (Basel)*. 2014;9:60-63.
42. Huebner J, Micke O, Muecke R, et al; PRIO (Working Group Prevention and Integrative Oncology of the German Cancer Society). User rate of complementary and alternative medicine (CAM) of patients visiting a counseling facility for CAM of a German comprehensive cancer center. *Anticancer Res*. 2014;34:943-948.
43. Nicolaisen-Murmann K, Thiel F, Mohrmann S, et al. Complementary and alternative medicine in women with gynecological and breast malignancies—a multicenter study exploring prevalence and motivation. *Geburtshilfe Frauenheilkd*. 2005;65:178-185.
44. Koehl B, Muenstedt K, Micke O, et al. Survey of German non-medical practitioners regarding complementary and alternative medicine in oncology. *Oncol Res Treat*. 2014;37:49-53.
45. Hack CC, Hüttner NBM, Fasching PA, Beckmann MW. Development and validation of a standardized questionnaire and standardized diary for use in integrative medicine consultations in gynecologic oncology. *Geburtshilfe Frauenheilkd*. 2015;75:377-383.
46. Hack CC, Antoniadis S, Hackl J, et al. Breast cancer patients' satisfaction with individual therapy goals and treatment in a standardized integrative medicine consultancy service [published online April 27, 2018]. *Arch Gynecol Obstet*. doi:10.1007/s00404-018-4779-4
47. Witt CM, Ausserer O, Baier S, et al. Effectiveness of an additional individualized multi-component complementary medicine treatment on health-related quality of life in breast cancer patients: a pragmatic randomized trial. *Breast Cancer Res Treat*. 2015;149:449-460.
48. Greenlee H, Balneaves LG, Carlson LE, et al; Society for Integrative Oncology. Clinical practice guidelines on the use of integrative therapies as supportive care in patients treated for breast cancer. *J Natl Cancer Inst Monogr*. 2014;2014:346-358.
49. Beuth J, van Leendert R, Schneider B, Uhlenbruck G. Complementary medicine on side-effects of adjuvant hormone therapy in patients with breast cancer. *In Vivo*. 2013;27:869-871.
50. Melzer J, Rosch W, Reichling J, Brignoli R, Saller R. Meta-analysis: phytotherapy of functional dyspepsia with the herbal drug preparation STW 5 (Iberogast). *Aliment Pharmacol Ther*. 2004;20:1279-1287.
51. Hack CC, Voiss P, Lange S, et al. Local and systemic therapies for breast cancer patients: reducing short-term symptoms with the methods of integrative medicine. *Geburtshilfe Frauenheilkd*. 2015;75:675-682.
52. Ryan JL, Heckler CE, Roscoe JA, et al. Ginger (*Zingiber officinale*) reduces acute chemotherapy-induced nausea: a URCC CCOP study of 576 patients. *Support Care Cancer*. 2012;20:1479-1489.
53. Kassab S, Cummings M, Berkovitz S, van Haselen R, Fisher P. Homeopathic medicines for adverse effects of cancer treatments. *Cochrane Database Syst Rev*. 2009;(2):CD004845.
54. Deng GE, Frenkel M, Cohen L, et al; Society for Integrative Oncology. Evidence-based clinical practice guidelines for integrative oncology: complementary therapies and botanicals. *J Soc Integr Oncol*. 2009;7:85-120.
55. Gerber B, Scholz C, Reimer T, Briese V, Janni W. Complementary and alternative therapeutic approaches in patients with early breast cancer: a systematic review. *Breast Cancer Res Treat*. 2006;95:199-209.
56. Ben-Arye E, Samuels N, Schiff E, Raz OG, Sharabi IS, Lavie O. Quality-of-life outcomes in patients with gynecologic cancer referred to integrative oncology treatment during chemotherapy. *Support Care Cancer*. 2015;23:3411-3419.
57. German Guideline Program in Oncology. Interdisciplinary. S3 guidelines for the diagnosis, treatment and follow-up care of breast cancer (version 4.0, 2017). <http://www.leitlinienprogramm-onkologie.de/leitlinien/mammakarzinom>. Accessed April 2, 2018.