

Scientific Article

An Integrative Medicine Educational Program for Radiation Oncology Patients: Patient-Reported Outcomes



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Purpose: Complementary health approaches (CHAs) equip patients to self-manage radiation therapy (RT)-related symptoms and fulfill unmet needs, but few disclose CHA use to their radiation oncologist. An integrative medicine educational program (IMEP) was developed to assess its ability to improve patient self-efficacy for symptom management and CHA use disclosure.

Methods and Materials: The IMEP included 4 1-hour sessions covering topics of (1) meditation, (2) yoga, (3) massage therapy, and (4) nutrition. Individuals over age 18 years and actively receiving RT were administered presession and postsession surveys. The primary outcomes were intention to disclose CHA use and self-efficacy. Qualitative data were assessed with a thematic approach.

Results: Overall, 23 patients attended 1 or more sessions, yielding 43 completed surveys. Compared with 35.9% of participants who had disclosed CHA use before the session, 67.4% intended to disclose after the session. Of the 5 self-efficacy statements, there were significant improvements in "I have ownership over my health" (increase of 0.42; 95% CI, 0.07-0.77; $P = .01$), "I have tools to manage my disease on my own" (1.14; 95% CI, 0.42-1.87; $P = .001$), and "I have control over my cancer" (0.96; 95% CI, 0.39-1.53; $P < .001$). Barriers to involvement included transportation, timing relative to RT appointment, and poor performance status.

Conclusions: A radiation-specific IMEP resulted in a high rate of intention to disclose CHA use and improvements in patients' reported self-efficacy to manage radiation-related symptoms. However, substantial resources were needed to deliver the IMEP. Future work must focus on increasing accessibility through telehealth and flexible timing.

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Introduction

A cancer diagnosis affects the physical, mental, spiritual, and psychosocial well-being of an individual.¹⁻⁴ Oncologic treatment paradigms include combinations of

surgery, systemic therapy, and radiation, each associated with time commitments and various side effects. Even with modern therapy, long-term survival for patients with advanced cancers remains limited.⁵ In the face of life-changing uncertainties, patients often explore complementary health approaches (CHAs) to address unmet needs, including management of treatment-related toxic effects and anxiety.⁶⁻¹³ Complementary health approaches, also referred to as complementary and alternative medicine, are nonmainstream practices, such as natural products and mind-body techniques, used together with conventional medicine.¹⁴ Patients with cancer use CHAs more than the general population,¹⁵⁻¹⁷ at rates of 40% to 50% in most studies, with some reports as high as 90%.^{12,13,18-20}

Despite the prevalence of CHAs, oncology patients seldom disclose their use to their oncologists.¹⁸⁻²¹ Barriers for disclosure include physician noninquiry; expectations of physician disapproval, disinterest, or inability to provide information; and the perception that CHA use is not relevant to their conventional treatment.^{18,21} However, disclosure remains imperative because many chemical constituents of complementary herbs and supplements can have biologically synergistic or radioprotective effects with radiation therapy²²⁻²⁴ and, in the case of antioxidants, may diminish the effect of radiation.²⁵

Individuals undergoing radiation therapy have unique sets of needs because of radiation-related toxicities and radiation-specific situational anxiety.²⁶⁻²⁹ Radiation oncology patients have reported a perceived lack of control, barring them from effective self-management of treatment-related toxic effects.²⁷ Self-efficacy is defined as one's ability to complete a task or reach a goal.³⁰ Self-efficacy is derived from an efficacy belief (a belief that one can complete the task) and a behavior model (an understanding of how to complete the task).³⁰ Complementary health approaches are inherently patient-centered and often designed for self-directed use.¹⁴ Considering the quality-of-life issues surrounding conventional treatment, CHAs may have a meaningful effect on the radiation experience by increasing self-efficacy and empowerment to take control of one's health.

Previously, patients have acknowledged a need for improved CHA education and have shown interest in attending a hospital-based educational program.³¹ However, there are no data exploring the utility and benefit of a radiation-specific CHA educational program. In this study, we investigated the feasibility of implementing an integrative medicine educational program (IMEP) and the associated patient-reported outcomes, including intention to disclose CHA use, self-efficacy, and patient satisfaction. We hypothesized that by providing patients with efficacy beliefs and behavior models for using CHAs, the IMEP would increase patients' self-efficacy to manage their own symptoms. Additionally, by providing a space to openly discuss CHA use, we hypothesized that patients

would be more likely to disclose their CHA use to their radiation oncologist.

Methods and Materials

Program overview

A prospective qualitative study was designed for an outpatient radiation oncology clinic at a large academic hospital. The IMEP included 4 1-hour sessions over the course of 2 weeks. The program was offered on 2 separate occasions, 1 month apart. Each session focused on a specific CHA and included both didactic and interactive components. Anonymous questionnaires were administered before and after each session.

Eligibility and recruitment

Eligible participants were at least 18 years of age and actively undergoing radiation therapy during the time of the session. Patients were recruited through flyers, by nursing staff during on-treatment visits, by radiation therapists during treatment sessions, and by a designated study team member in the waiting room. Written informed consent was obtained at the beginning of each session. The study protocol was approved by the institutional review board of Vanderbilt University.

Educational program design

The curriculum was developed through a collaborative effort between the departments of integrative medicine and radiation oncology. A total of 4 sessions were developed that covered the CHAs most frequently used by adults in the United States³² (Box 1).

The content for each session was designed by a trained, certified integrative practitioner with a focus on the needs of patients undergoing radiation.^{7-10,26,33} For example, brief meditation exercises were introduced as a response to situational anxiety while a patient was on the radiation treatment machine.²⁶ The didactic components included a description of the CHA, historical context, indications, instructions on use, and relevant data. The interactive component included experiential practice of the modality.

After each session, time was allocated for questions and answers. Patients were asked to comment on their experience and share their opinions about CHAs and radiation therapy. At the conclusion of each session, patients were provided with printed resources related to the topic, including instructions on how to individually practice each modality.

Box 1 Curriculum for the integrative medicine educational program (IMEP)

Topic	Details
Yoga	Using movement to manage stress and emotion. Practice light yoga techniques from a sitting or lying position.
Massage therapy	Overview of oncologic massage to treat pain, muscle tension, and lymphedema. Practice self-massage of the shoulders and neck.
Meditation	Using mindfulness to manage stress and emotions. Practice breathing techniques to use in the waiting room or on the treatment table.
Cancer nutrition	Maintaining and improving nutritional status during treatment and recovery. Practice making smoothies with high nutritional content.

Assessment tool

Participants received pre-session and post-session surveys. Surveys were designed to assess improvements in self-efficacy, likelihood of disclosing CHA use, and patient satisfaction compared with baseline. The pre-session survey included 3 parts:

1. A list of CHA modalities¹⁴ used currently or recently and which, if any, were disclosed to the participant's radiation oncologist, using selected questions from the Assessment of Patient Experiences of Cancer Care survey.³⁴
2. Baseline self-efficacy, using a 5-item tool adapted from the validated General Self-Efficacy Scale.³⁵ Participants reported level of agreement on a 9-point Likert scale for the following statements:
 - a. "I have ownership over my health."
 - b. "I have tools to manage my disease on my own."
 - c. "I have control over my cancer."
 - d. "I am effective in coping with my cancer."
 - e. "I believe that achieving wellness is due to my efforts as compared to factors which are beyond my control."
3. Demographic data.

The post-session survey included 4 parts:

1. Intention to disclose CHA use after the session, as measured by level of agreement with the statement, "I intend to discuss my use of complementary health approaches with my radiation oncologist at a future follow-up visit."
2. Post-session self-efficacy, using the same 5-item tool as in the pre-session survey.
3. Satisfaction with the session, measured by level of agreement with the statement, "This lecture enhances my experience as a patient receiving radiation therapy."
4. Qualitative data, including the most important aspects of the session, preferred formats for receiving information, and changes in actions and perceptions because of the session.

Data analysis

A sample size of 50 completed surveys was estimated. The primary outcomes were intention to disclose CHA use and change in self-efficacy scores from pre-session to post-session surveys. The linear mixed-effects model was used to compare the pre-session and post-session self-efficacy score while adjusting for the nested random patient and random survey effects (1 patient participated in multiple sessions, and pre-session and post-session self-efficacy scores were collected for each session). Descriptive statistics were used to assess agreement with statements on Likert scales. For continuous variables, the median and IQR were reported. For categorical variables, the frequencies and the percentages were calculated. Statistical significance was defined a priori at a *P* value of <.05. Qualitative data were analyzed using a thematic approach.

Results**Demographic data**

Overall, 23 eligible patients attended 1 or more sessions, resulting in a total of 46 participants across all sessions. Of an average of 100 patients receiving radiation each day, 5 to 7 patients attended a session. Of the 46 total participants, 45 returned the surveys at the end of the session. Two surveys included incomplete data and were excluded from analysis, resulting in a total of 43 analyzable surveys and 22 analyzable patients. The final response rate was 93.5%. The patient characteristics and session attendance are shown in [Tables 1](#) and [2](#), respectively.

Among the 22 analyzable patients, the median age was 64.0 years (IQR, 55.2-70.8 years); 50.0% of the participants were male; most were White (85.7%) and reported a high educational status (68.2% had a college degree or higher). Overall, 54.6% had prostate or breast cancer. Thirteen patients (59.1%) attended more than 1 session. There was no significant variation in the number of participants based on the topic of the session (*P* = .77).

Table 1 Patient characteristics

Characteristic	Patients, No. (%) (N = 22)
Age, median (IQR), y	64.0 (55.2-70.8)
Gender	
Female	11 (50.0)
Male	11 (50.0)
Ethnicity	
Hispanic or Latino	1 (4.5)
Non-Hispanic or Latino	21 (95.5)
Race	
American Indian or Alaskan Native	0
Asian	1 (4.8)
Black	2 (9.5)
White	18 (85.7)
Other	0
Education	
High school graduate or GED	4 (18.2)
Some college	3 (13.6)
College graduate	6 (27.3)
Some graduate school	4 (18.2)
Graduate degree or higher	5 (22.7)
Income, \$	
<25,000	1 (5.9)
25,000-50,000	8 (47.1)
50,000-75,000	1 (5.9)
75,000-100,000	3 (17.6)
>100,000	4 (23.5)
Cancer site	
Prostate	6 (27.3)
Breast	6 (27.3)
Head and neck	4 (18.2)
Lymphoma	1 (4.5)
Gynecologic	3 (13.6)
Central nervous system	2 (9.1)

Abbreviation: GED = General Educational Development.

CHA use and disclosure

Of the 22 patients who attended, 81.8% had used 1 or more CHAs in the past 12 months. The CHAs most used were meditation or deep breathing exercises (59.1% of patients), dietary supplements (31.8%), and massage (31.8%). Detailed information about CHA use is shown in [Table 3](#).

Table 2 Session attendance

Sessions attended, No.	Patients, No. (N = 22)
1	9
2	6
3	2
4	4
Topic	Total completed surveys, No. (%) (N = 43)
Yoga	10 (23.3)
Massage therapy	13 (30.2)
Meditation	9 (20.9)
Cancer nutrition	11 (25.6)

Table 3 Use of complementary health approaches (CHAs)

CHAs	Patients, No. (%) (N = 22)
Number used	
0	4 (18.8)
1	4 (18.8)
2	4 (18.8)
3	3 (13.6)
4	4 (18.8)
≥5	3 (13.6)
Type*	
Deep breathing	10 (45.4)
Dietary supplements	7 (31.8)
Massage therapy	7 (31.8)
Meditation	6 (27.3)
Probiotics	5 (22.7)
Yoga	4 (18.2)
Chiropractic or osteopathic manipulation	3 (13.6)

* Not listed are CHAs used by 2 patients (9.1%), including healing touch, homeopathic or naturopathic medicine, qi gong, and reiki, or those used by 1 patient (4.5%), including acupuncture, faith healing, guided imagery, myofascial release, and traditional healers.

On presession surveys, only 35.9% of those using CHAs had disclosed use to their radiation oncologist. On postsession surveys, 67.4% of participants reported that they intended to disclose their CHA use. Mean agreement with the statement “I would feel comfortable discussing the use of complementary health approaches with my radiation oncologist” was 7.95 at baseline and 8.09 postintervention ($P = .60$). Common reasons for nondisclosure included physician noninquiry (53.8%), not thinking it

Table 4 Pre-session and post-session self-efficacy

Self-efficacy statement	Mean pre-session agreement (SD)*	Mean post-session agreement (SD)*	Change (95% CI)	P value
I have ownership over my health	7.7 (1.9)	8.1 (1.3)	0.42 (0.07 - 0.77)	.01
I have tools to manage my disease on my own	5.6 (2.6)	6.7 (1.9)	1.15 (0.42 - 1.87)	.001
I have control over my cancer	5.1 (2.9)	6.1 (2.4)	0.96 (0.39 - 1.53)	< .001
I am effective in coping with my cancer	7.5 (1.7)	7.5 (1.7)	-0.01 (-0.33 to 0.31)	.47
Achieving wellness is due to my efforts	6.7 (1.9)	7.0 (1.8)	0.32 (-0.14 to 0.78)	.09

* Agreement on 9-point Likert scales.

was important to disclose (11.5%), or not thinking about disclosing at all (11.5%). The least common reason for nondisclosure was concern for physician disapproval or impact on quality of care (3.8%).

Self-efficacy

Of the 5 self-efficacy measures, there was a significant postintervention increase in 3 of the measures compared with baseline (Table 4). Participants demonstrated improved ownership over their health ($P = .01$), having tools to manage their disease on their own ($P = .001$), and control over their cancer ($P < .001$). There was a trend toward belief that achieving wellness was due to their own efforts ($P = .09$), but there was no difference in reports of being effective in coping with their cancer ($P = .47$).

Satisfaction

There were high levels of patient satisfaction at baseline, with no significant change after the session (8.28 pre-session vs 8.51 post-session; $P = .16$). Ninety-eight percent of survey participants agreed that the lecture enhanced the patient experience, with a mean agreement of 7.89. Participants also strongly agreed that the information in each session should be available to all patients receiving radiation treatment, with mean agreement of 8.23.

Qualitative data

As mentioned previously, recruitment was limited, and only a small number of patients (5-7 of 100) attended each session. Reasons for not attending were reported to the study team member who recruited patients in the waiting room. The most reported barriers to attending were related to timing and transportation. If their treatment time did not coincide with the time of the educational session, they could not or did not want to make a second visit to the department. For those who could not make a second visit to the department, the most common reason was related to transportation, either owing to

relying on a caregiver for transportation or living a far distance from the clinic. Many others stated that they could not attend due to feeling poorly. Treatment-related side effects or overall poor performance status prevented patients from taking on any activities in addition to their necessary treatment.

Another source of qualitative data was the post-session survey, which included open-ended, free-response items. When asked to state the most important aspects of the session to convey to all radiation oncology patients, 20.9% of surveys mentioned relaxation or stress relief. Additionally, 14.0% mentioned a newfound ability to help themselves, with 1 participant stating, "We are not victims – we can do something – a lot," and another saying, "[The patient is] the most important part of the healing process." One participant reported that the most important aspect to convey to others is that "we can talk about [CHAs]." Participants often stated that there should be additional information or advice about specific CHAs, with 18.6% referring to nutrition. Many participants stated that the information should be made available in other formats, including video format (39.5% of participants), one-on-one coaching (16.3%), and printed materials (14.0%).

Participants were also asked what they would do differently because of attending the sessions, with 58.1% reporting they would practice what they learned. Another 11.6% mentioned that they would independently learn more about the topic presented. When asked how the session changed their view of wellness, 1 participant said, "Health improvement does not necessarily just include medications and radiation/chemo treatment." Another 3 participants mentioned that they saw the benefit of incorporating CHAs into conventional medicine.

Participants also provided suggestions for improvement, both on the post-session survey and voiced during sessions. Most importantly, participants were less interested in overall lifestyle changes and more interested in learning how to cope with treatment. For example, during the first nutrition session, 1 patient stated that he did not want an overhaul on his diet; rather, his goal was to maintain his weight and avoid the need for a feeding tube. Additionally, several patients mentioned they would have preferred to receive the information earlier, before starting cancer-directed therapies, to use proactively. When

asked to share additional thoughts on the postsession survey, 2 participants asked for “continuation and/or expansion of these sessions.”

Discussion

In this study, we demonstrated the benefits and challenges of a radiation oncology–focused IMEP. To our knowledge, this is the first reported program of its kind. By implementing such a program, we showed a high rate of intention to disclose CHA use, improved self-efficacy in wellness efforts, and a qualitatively enhanced radiation treatment experience. Despite these improvements, recruitment was cumbersome, and only a small percentage of patients (5%-7%) undergoing treatment attended the sessions. Of those who attended, the majority (85.7%) were White with a higher educational background (68.2%) and a diagnosis of breast or prostate cancer.

Understanding patient CHA use is relevant to patient care in the radiation oncology setting. As mentioned previously, there may be safety concerns regarding the use of certain CHAs while undergoing radiation therapy. For example, radiation exerts its antitumor effect, in part, by creating reactive oxygen species that damage DNA.³⁶ The administration of megadoses of antioxidant vitamins A, C, or E is sometimes recommended by integrative practitioners, but these treatments can counteract the therapeutic effects of radiation by scavenging reactive oxygen species.²⁵ Disclosure of CHA use also provides physicians with an opportunity to better understand patients' symptom management needs and how to address them. Open discussion of CHA use may strengthen the patient-physician relationship, which in turn may lead to higher rates of symptom reporting and effective management.³⁷

In this study, 82.0% of patients reported CHA use within the past 12 months, but only 35.9% had disclosed use to their radiation oncologist. Previous studies have shown that patient characteristics such as younger age, higher income, and higher level of education predict disclosure of CHA use.^{38,39} However, our sample population had a low baseline rate of disclosure despite overall high levels of income and education. The IMEP increased the anticipated disclosure rate to 67.4%. Adler et al demonstrated that patients who perceived their physicians as being “respectful, open-minded, and willing to listen” were more likely to disclose the use of CHAs.⁴⁰ However, beyond patient perceptions, there are limited data on interventions that can improve disclosure. The IMEP may have created an environment that promoted comfort with CHA discussion, thereby increasing the anticipated disclosure rate. Regardless, this study continues to underline the importance of physician inquiry, which was the most common reason for nondisclosure.

The educational sessions improved 3 out of 5 self-efficacy measures. Specifically, the postsession survey

demonstrated enhanced feelings of ownership over one's individual health, new tools to manage their disease, and a sense of control over their cancer. These results are particularly meaningful because efficacy beliefs have been shown to affect goal setting as well as behaviors aimed at achieving those goals, leading to improved outcomes.⁴¹⁻⁴³ In this study, self-efficacy improvements occurred after attending just 1 session, which contributes to the feasibility of this educational intervention.

By implementing 2 iterations of the IMEP 1 month apart, we had the opportunity to improve the material based on real-time patient feedback. Content delivery and the educational experience were improved by altering the physical environment: dimming the lights, playing ambient music, opening the session with a moment of silence, and arranging the tables in a semilunar shape. During the first nutrition session, the didactic component focused on the optimal nutritional balance in the remission and recovery phase of cancer. In response, patients wanted to learn more about maintaining weight during active treatment and nutritional tools to combat adverse effects of nausea, fatigue, mucositis, and early satiety. They learned the importance of focusing on acute symptom management and on-treatment issues. Participants expressed that during active treatment, simple, convenient, and effective tools are needed to successfully complete therapy.

Despite the program's benefits, there were several limitations. Substantial time was needed to plan and coordinate the educational sessions. Patient recruitment could not be effectively integrated into the existing nursing or radiation therapist workflows. Despite numerous flyers, a complementary lunch, and ample lead time, the only effective method of recruitment was by a designated study team member, who spent substantial time (about 4 hours per day) seeing patients face to face in the waiting room and describing the lectures in detail. Even with this hands-on approach, only 5% to 7% of the patients being treated on a given day attended the educational session. Attendance was limited by timing around treatment, transportation, and poor performance status. The population described in this study represents a convenience sample, because most of the participants had a treatment time near the session time and most had breast or prostate cancer, which are associated with higher performance status. The interpretation of disclosure of CHA use is limited in that the outcome was based on intention to disclose. However, intention to act is strongly correlated with action.^{44,45} Finally, these data were self-reported, so there was potential for recall bias.

Conclusion

Although the sessions were positively reviewed, there was a substantial cost of time and resources with a limited reach. Radiation patients exert considerable energy during

daily treatment, making it difficult to commit an additional hour to education. Current integrative medicine models are primarily designed for healthier patients who often self-refer without insurance reimbursement. These issues are major barriers for incorporating integrative medicine into radiation oncology. Simply put, patients may be overwhelmed with the task of getting through treatment and are too frail or symptomatic to focus on enhancing wellness through complementary techniques. Moving forward, it is important to explore models that better weave complementary care into existing treatment paradigms. Possibilities include combining integrative care with supportive oncology clinics, offering sessions over telehealth, and providing online resources at the time of consultation. This study demonstrates the importance of providing integrative oncologic care for patients receiving radiation therapy. The task ahead is determining how to deliver this care with improved access and cost-effectiveness.

Disclosures

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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