Growth of Integrative Medicine at Leading Cancer Centers Between 2009 and 2016: A Systematic Analysis of NCI-Designated Comprehensive Cancer Center Websites

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Abstract

Background: Cancer centers have increasingly offered integrative medicine therapies in response to their patients’ unmet needs. We evaluated the growth of integrative medicine in leading academic cancer centers in the United States as reflected by their public-facing websites.

Methods: We performed a systematic review of 45 National Cancer Institute (NCI)–designated comprehensive cancer center websites. Two researchers independently evaluated whether the websites provided information regarding integrative medicine modalities and, if so, whether the services were provided in the same health system. They compared the proportion of cancer centers providing the information on each modality in 2016 with the data from the prior study in 2009.

Results: The most common integrative medicine therapies mentioned on the 45 NCI-designated comprehensive cancer center websites were exercise (97.8%) and acupuncture and meditation (88.9% each), followed by yoga (86.7%), massage (84.4%), and music therapy (82.2%). The majority of the websites also provided information on nutrition (95.6%), dietary supplements (93.3%), and herbs (88.9%). The most common therapies offered in the health systems were acupuncture/massage (73.3% each), meditation/yoga (68.9% each), and consultations about nutrition (91.1%), dietary supplements (84.4%), and herbs (66.7%). Compared with 2009, there was a statistically significant increase in the number of websites mentioning acupuncture, dance therapy, healing touch, hypnosis, massage, meditation, Qigong, and yoga (all \( P < .05 \)).

Conclusions: Leading US cancer centers increasingly present integrative medicine content on their websites, and the majority of them provide these services to patients in the same health systems.

While conventional cancer treatments have greatly reduced cancer-related mortality, these therapies often produce adverse effects such as fatigue, hot flashes, nausea, and postoperative pain that may negatively impact quality of life (1,2). Consequently, many cancer patients suffer from both the symptoms of cancer itself and the side effects related to conventional treatments.

Patients’ unmet needs in managing these symptoms coupled with their desire to use natural approaches to improve their health have created a demand for integrative medicine (3,4). According to the National Center for Complementary and Integrative Health (NCCIH), integrative medicine differs from complementary and alternative medicine (CAM) because it brings together conventional and complementary treatments in a coordinated way (5). Neither rejecting conventional therapies nor relying on alternative medicine, integrative medicine adopts only those complementary modalities supported by the...
The use of integrative medicine is extensive among cancer survivors. Globally, up to 43% of patients with cancer have used integrative medicine therapies during their treatment, and the overall prevalence of integrative medicine use has increased noticeably over the past years (24–26). In the United States, cancer survivors use integrative medicine even more than individuals without cancer (27). Cancer survivors are more likely to use integrative medicine because their conventional health providers recommended it to them (28).

In 2009, our group found that more than 60% of National Cancer Institute (NCI)–designated comprehensive cancer centers provided information related to integrative therapies on their websites (29). Despite increasing evidence for the effects of integrative medicine in recent literature, the pattern of growth in integrative medicine since 2009 is unknown. Thus, we conducted a systematic review of the websites of all 45 NCI-designated comprehensive cancer centers to determine the change in integrative medicine content on their websites. In addition, we identified what services are provided in the same health system where the cancer centers are located.

Methods
We conducted a systematic analysis on the websites of all 45 NCI-designated comprehensive cancer centers between January 2016 and May 2016 (30). After initial training, two researchers (HY and LS) independently evaluated whether these websites provided relevant information regarding integrative medicine modalities, and if so, they performed further searches to determine whether the services were provided in the same health systems where the cancer centers were located. The authors discussed discrepancies in data collection to reach consensus. Since the websites were regularly updated even within the research period (January–May 2016), we updated any changes in the interim in the final data set for analysis.

Criteria for Evaluation of Content
We approached analysis of web content from the perspective of a patient or family member attempting to access information on integrative medicine modalities or seeking integrative medicine services at a particular cancer center via its website. We searched for the specific types of integrative medicine modalities based on a prior study in 2009 (29). Furthermore, we included evaluation for accessibility, such as whether the websites had pages dedicated to integrative medicine and phone numbers available to access such services directly. Lastly, to determine whether integrative medicine services were provided in the same health system, we attempted to identify clinicians utilizing integrative medicine therapies on-site in that particular institution. For example, we searched the directory of clinicians on the cancer center websites to find licensed acupuncturists or physicians who practice acupuncture.

Analyses
We analyzed the frequency with which each integrative medicine modality was mentioned on the websites and compared the number of cancer centers providing the information on each modality with the data from the prior study in 2009 using chi-square tests. All analyses were performed using SPSS Statistics V21.0 (IBM, Armonk, NY), with a two-sided significance level of .05 indicating statistical significance.

Results
The most common integrative medicine modalities that appeared on the 45 NCI-designated comprehensive cancer center websites were exercise (97.8%) and acupuncture and meditation (88.9% each), followed by yoga (86.7%), massage (84.4%), and music therapy (82.2%). Additionally, many of the websites provided information on nutrition (95.6%), dietary supplements (93.3%), and herbs (88.9%).

Compared with the results from 2009, the number of cancer centers providing information on integrative medicine has increased for all modalities except guided imagery (Table 1). Among these changes, websites with references to dietary supplements experienced the largest growth (51.8%, \( P < .001 \)), followed by exercise (51.5%, \( P < .001 \)), and herbal supplements (45.0%, \( P < .001 \)). Notably, there was more than 30% growth in each of the four representative integrative medicine modalities: acupuncture (30.3%, \( P = .005 \)), massage (30.7%, \( P = .002 \)), meditation (32.8%, \( P = .001 \)), and yoga (30.6%, \( P = .002 \)).

The most common therapies offered on-site in the same health system were acupuncture and massage (73.3% each), meditation and yoga (68.9% each), and consultations on nutrition (91.1%), dietary supplements (84.4%), and herbs (66.7%). Although other therapies such as art, dance, exercise, and music were not frequently offered on-site, many centers provided information on supportive groups or sports facilities offering these modalities for cancer patients. Furthermore, some cancer centers had web pages with self-guided multimedia such as mind-body therapy resources for meditation and guided imagery.

We found a statistically significant difference between the number of cancer centers that provide online information on integrative medicine and the number of cancer centers that actually deliver integrative medicine services on-site. Specifically, there is a statistically significant difference in online information vs on-site services for 11 modalities, including Ayurveda (40.0% vs 6.7%, \( P < .001 \)), exercise (97.8% vs 55.6%, \( P < .001 \)), herbal supplements consultation (88.9% vs 66.7%, \( P = .01 \)), meditation (88.9% vs 68.9%, \( P = .02 \)), music therapy (82.2% vs 48.9%, \( P = .001 \)), and yoga (86.7% vs 68.9%, \( P = .04 \)) (Table 1).

Among the 45 comprehensive cancer centers, 29 (64.4%) had phone numbers and 26 (57.8%) had web pages dedicated to integrative medicine, but they were not necessarily limited to cancer-specific therapy, with some web pages included in larger categories such as palliative medicine or quality of life care. Likewise, we found that 27 centers (60%) provided physician consultations on integrative medicine within the same academic health system.
Discussion

Between 2009 and 2016, increasing numbers of NCI-designated cancer centers have provided information on their websites about integrative medicine. In addition, we found that the majority of cancer centers offer some components of integrative medicine within the same academic health systems. These findings suggest that these leading centers are incorporating integrative medicine into their cancer care delivery systems. Our study offers novel insight on the extent to which cancer centers are providing information about integrative medicine on their websites.

Our findings are important because up to 81% of cancer patients obtain information about their disease and treatment on their own from the Internet or via friends and family members (31–33). Research also shows that the frequency of patients searching specifically for information on complementary and alternative medicine treatment options has increased (34). Because many commercial websites often include deceptive claims about unproven unconventional therapies (35), it is reassuring that increasing numbers of the 45 NCI-designated comprehensive cancer centers provide information to their potential and current patients/families to help differentiate integrative medicine from alternative cancer therapies. Meeting patients’ information-seeking needs is important to ensure that cancer patients use evidence-informed complementary therapies together with, rather than instead of, conventional treatments.

Furthermore, as early detection and treatment advances have resulted in many cancers becoming treatable chronic conditions rather than fatal diseases, there is a growing recognition of cancer patients’ need for survivorship care that includes symptom management, psychosocial support, and health promotion as important components for their well-being (36–38). Emerging research suggests that meditation relieves cancer-related distress (22), yoga can help sleep (39), and acupuncture can help with pain (40) and hot flashes (14). Therefore, cancer centers have the opportunity to make these therapies a part of their comprehensive supportive care delivery to enhance symptom control and quality of life for patients during and beyond cancer treatment. Increasing research also demonstrates the value of lifestyle modifications such as healthy diet, weight control, and physical activity not only for cancer prevention, but also for the overall health and survival of cancer patients. Thus, incorporating these modifications into the cancer care delivery system is critical to support patients’ health and well-being.

Despite its potential, numerous challenges exist for the effective implementation of integrative medicine in conventional cancer care settings, including the credentialing and regulation of integrative medicine therapists, the development of sustainable funding models, and the fostering of interdisciplinary collaboration (41). For example, while exercise information is provided in 97.8% of cancer center websites, only 55.6% provide exercise/fitness services for their cancer patients. As scientific evidence accumulates, health policies that ensure adequate insurance coverage or novel payment models—such as including integrative medicine treatments as a part of bundled payments—are needed to explore how to make these services available to cancer patients.

We need to acknowledge several limitations to this study. First, given the constantly changing and evolving nature of the Internet, we are only reporting on a snapshot of the online...
information at the time of data collection. Second, the improved information presentation on websites about integrative medicine may be related to more medical information being presented overall on cancer centers’ websites rather than to a specific increase in information about integrative medicine. Third, even though we approached this analysis from the perspective of a patient or a family member attempting to access information on integrative oncology treatment modalities via the Internet, the researchers in this study are clinicians familiar with integrative medicine, not patients. Lastly, this study focused on information presented online rather than the actual integrative medicine services provided; thus, we may have missed the centers that provide integrative medicine services but do not reflect this on their websites.

Despite these limitations, we found that there has been substantial growth in the presence of integrative medicine on the websites of NCI-designated comprehensive cancer centers since 2009. In addition, the majority of the centers provide integrative medicine services within the same academic health systems in which they are located. As these centers lead the way in cancer research and clinical innovation, we need to ensure that integrative medicine can be cohesively incorporated into the continuum of cancer treatment and survivorship care using a financially sustainable structure. In addition, evidence-informed integrative medicine needs to expand beyond the walls of academic medical centers into community cancer centers and clinics to benefit patients from diverse socioeconomic backgrounds.

Funding
This work was supported in part by a National Cancer Institute grant to the Memorial Sloan Kettering Cancer Center (grant number P30-CA08748) and the Byrne Fund at the Memorial Sloan Kettering Cancer Center.

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