Cancer and Complementary Therapies: Current Trends in Survivors' Interest and Use

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Abstract

Background. Cancer survivors use complementary therapies (CTs) for a variety of reasons; however, with interest and use reportedly on the rise and a widening range of products and practices available, there is a need to establish trends in and drivers of interest. We aimed to determine (1) frequencies of use, level of interest, and barriers for 30 specific CTs and (2) whether physical symptoms, perceived stress (PS), or spiritual well-being were related to interest levels. *Method.* A total of 212 cancer outpatients were surveyed at the Tom Baker Cancer Centre in Calgary, Canada. *Results.* Overall, up to 75% of survivors already used some form of CTs since their diagnosis. The most highly used were the following: vitamins B12 and D, multivitamins, calcium, and breathing and relaxation exercises. Those who had not used CTs indicated highest interest in massage, vitamin B12, breathing and relaxation, mindfulness-based stress reduction, and antioxidants. The most frequently reported barriers for all CTs were not knowing enough about what a therapy was and not having enough evidence on whether it worked. High PS predicted higher interest for all CTs, but spirituality was not significantly related to any. Physical symptoms, anxiety, and depression were significant predictors of interest for some CTs. *Conclusion.* These findings provide a blueprint for future clinical efficacy trials and highlight the need for clinical practice guidelines.

Keywords

complementary medicine, complementary therapies, cancer, predictors, interest, use, barriers, clinical practice guidelines

Introduction

Two in 5 Canadians will develop cancer in their lifetime, and 65% will survive onward after treatment for at least 5 years.[1] People living with cancer can experience significant stress (from existential distress, depression, and anxiety, to pain, fatigue, and insomnia) both during treatment and into survivorship, despite usual care. In an effort to alleviate these and other lingering symptoms and side effects, people often turn to complementary therapies (CTs) for help. Globally, over the past few decades, there has been close to a 25% increase in survivors' use of CTs.[2,3] Anywhere from 40% to 83% of survivors use CTs after diagnosis, and up to 90% of these report some benefits from use, whether it was improved coping with stress or the side effects of treatment.[2,4-6]

Taking into account the vast array of therapies that exist, the reportedly high prevalence of use in people with cancer and the abundance of misinformation touted by the media, survivors can easily become overwhelmed. To make health-related decisions in such a milieu is especially concerning because the potential for health risks and being misled increase substantially.[7] Whereas the evidence base for some CTs is strong or growing, it is equivocal or weak for others; thus, the need for further study into the efficacy of these treatments is urgent. However, future efficacy trials should not be based on the whims of researchers but rather on areas identified as important and "of interest" by survivors. We attempt to expand on current knowledge by investigating trends in CT use, interest, and barriers across a wide variety of therapies and commenting on the availability of clinical practice guidelines for these.

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Table 1. The 5 Categories of Complementary Therapies.

Category	Therapies
Biological	Dietary supplements, vitamins, minerals, herbs, teas
Mind-Body	Yoga, meditation, guided imagery, breathing exercises, mindfulness-based stress reduction, art therapy, music therapy
Body manipulation	Massage, chiropractic, osteopathy
Energy	Acupuncture, tai chi, qigong
Alternative medical systems	Naturopathy, traditional Chinese medicine, Ayurveda, homeopathy

Defining Complementary Therapies

It is important to understand CTs as those outside the scope of conventional Western medicine that are used in conjunction with conventional care, rather than as a replacement.[8] The National Center for Complementary and Integrative Health (NCCIH) classifies CTs into 5 categories (see Table 1 for details).[2,7,9]

Why Do Cancer Survivors Use CTs?

(1) Physical side effects of the disease or treatment, including pain, chronic fatigue, insomnia, and nausea, that cannot often be alleviated with conventional treatment.[9] (2) Relief from psychological distress such as anxiety or depression. (3) A desire to improve ability to cope with emotions, increase spiritual strength, and increase hope.[10-12] In fact, up to 50% of survivors struggle with spiritual existential issues, and addressing these allows better quality of life and finding meaning in life.[13-15]

There has been considerable literature (1) addressing prevalence of CT use and (2) examining why survivors use CTs.[3,8,10,12] Prevalence literature is broad in that it attempts to establish use across a large range of therapies, but these studies do not always include a range of CTs from all 5 categories.[3,8] As discussed above, the literature that examines survivors' motivations for using CTs has depth, in that studies have looked at demographics, personality, and coping characteristics to determine why CTs are used. However, these in-depth studies will often ask about CT use in general or only focus on a few therapies.[10,12] The present study attempts to combine breadth and depth by asking about a broad range of therapies and combining predictors from different past research studies to establish why patients use specific therapies.

Objectives

Our goals in the current study were (1) to provide a comprehensive picture of current use, interest in future use, and barriers to using 30 specific CTs for cancer survivors of any tumor groups; (2) to determine whether physical symptoms, perceived stress (PS), or spiritual well-being were related to interest; (3) to determine the availability of clinical practice guidelines for therapies with the highest interest and use.

Method

Participants

Participants were recruited from the Tom Baker Cancer Centre (TBCC) in Calgary, Alberta, Canada. Outpatient oncology clinics were targeted to include people from a wide range of tumor groups and stages of treatment while excluding the confounding effects of same-day treatment. People older than 18 years, with any tumor type or stage of cancer were included.

Procedure

Survivors at TBCC outpatient clinics were asked to participate in an anonymous, 10-minute survey study. Written consent was inferred by checking off a box indicating if they would/would not like their information used in our study. All procedures were approved by the University of Calgary Health Research Ethics Board, Cancer Control. Researchers kept track of the number of people approached and surveys given out and returned each day. Pilot testing occurred in September 2016, and data were collected in November and December 2016.

Instruments

CT Use, Interest, Barriers Scale. This scale was crafted for the present study but is based on previous complementary and alternative medicine surveys designed to assess level of interest in CTs and barriers toward CT involvement.[16,17] It included 30 CTs representative of the 5 categories. For each CT, participants were asked whether they had tried it in the past, and for each CT they had not tried, they rated their interest in potential future use on a scale from 1 to 7 (1 = *not interested*, 4 = *neutral*, 7 = *very interested*). They also indicated whether they experienced any of the 6 listed barriers for each CT, including access, financial expense, not knowing what the therapy is, not having enough evidence on whether it works, and not getting enough support from health care providers (HCPs) or family and friends.

Edmonton Symptom Assessment System–Revised (ESAS-R). This scale provides a quick assessment of symptom severity, with a score from 0 to 10 for each symptom (0 = *no discomfort*, 10 = *highest level of discomfort*). Symptoms included pain, tiredness, nausea, depression, anxiety, drowsiness, appetite, well-being, shortness of breath, and other. The ESAS has demonstrated validity and reliability in cancer survivors.[18-21]

Cohen's Perceived Stress Scale[22]. The PSS measured appraisal of stress in life and perceived ability to cope with stressors, using 10 questions rated on a scale from 0 (*never*) to 4 (*very often*). Items were summed to generate a total score. The PSS has acceptable psychometric properties, including factorial, content, and convergent validity.[23]

Functional Assessment of Chronic Illness Therapy—Spiritual Well-being (FACIT-Sp)[24]. This Likert scale assessed the ability to find meaning in life; thus, it was not a measure of religiosity but spiritual and existential well-being. The instrument has 2 subscales: meaning and peace, and the role of faith in illness as well as a total score. It includes 12 questions to which participants rated their level of agreement on a scale from 0 (*not at all*) to 4 (*very much*).[24] This scale had demonstrated sound reliability and validity in cancer populations.[24]

Demographics

These included the following: age, sex, marital status, visible minority and second language status, years of education, and employment status. Disease-related characteristics included the following: most recent cancer diagnosis, tumor type, stage of cancer, stage of treatment, time since diagnosis, and all types of treatments received for cancer.

Data Analysis

Data from article surveys was entered into a RedCap database, and each participant's information was double coded by 2 researchers for accuracy. A third data manager checked and resolved discrepancies.

The Statistical Package for Social Sciences (SPSS Version 24) was used for data analysis. Shapiro-Wilk's test was used to test normality, where $P > .05$ indicated if the variable was normally distributed. Frequency distributions were also examined. Because of bimodal distributions that broke the assumption of normality, the dependent variable of interest was dichotomized into *not interested* (ratings of 1 on the 7-point interest scale) or *interested* (ratings of 2-7 on the 7-point interest scale).

To evaluate the first research question concerning level of interest in each unused therapy, descriptive statistics and frequency tables were analyzed for mean and median interest trends in each CT as well as use and barriers.

The second research question evaluated the extent to which physical symptoms, PS, and spiritual well-being each contributed to interest levels. For each CT, significant relationships between interest in the CT and demographic variables were determined using 1 of 3 tests, with level of significance set at $P < .05$. Two-tailed Spearman correlations were used for continuous variables (age, years of education, and time since diagnosis). Mann-Whitney U tests were used for categorical 2-level variables (sex, minority status, second language status, and whether or not each treatment type

was used). Kruskal-Wallis H tests were used for categorical multilevel variables (marital status, employment status, cancer type, cancer stage, and treatment stage). Significant relationships between each CT and predictor variables were assessed using Spearman correlations. Predictors included the FACIT-spirituality total score, PS total score, and scores for each of the 10 symptoms from the ESAS Scale. In the logistic regression model, each demographic variable that was significantly correlated to interest for a CT was included in block 1 as a control, and each significantly correlated predictor was included in block 2. Significance of independent predictors was determined by $P < .05$ in Wald's χ^2 test, and odds ratios used to determine the likelihood of change in interest in accordance with a one-unit change in a predictor. Nagelkerke's pseudo R^2 statistic was used to explain the overall variance accounted for by the model.[25]

Results

Demographic and Disease Characteristics

Approximately 350 people were asked to participate in this study, and of these, 60% consented and the remaining 40% declined for reasons such as not having enough time, paperwork fatigue, or experiencing nausea, or anxiety. The total sample included 212 people aged 22 to 100 years (see Table 2 for demographics).

Use of, and Interest in, CTs

Overall, up to 75% of people had used biologically based CTs, 22% had used body manipulation CTs, and up to 21% had used mind/body CTs, followed by energy-based CTs (up to 11%) and alternative systems (up to 10%). In terms of specific therapies, the 10 most frequently used CTs were (highest to lowest) the following: vitamin B12, vitamin D, multivitamins, calcium, breathing/relaxation exercises, vitamin C, green tea, massage, meditation, and fish oils (see Table 3).

For those who had not yet tried a therapy, interest ratings ranged from 1 (*not interested*) to 7 (*very interested*); however, mean interest for every CT hovered on the low end of the scale between 2 and 3, and medians ranged from 1 to 4. Despite the low variability in scores, people reported the highest interest for these 10 therapies (highest to lowest): massage, vitamin B12, breathing and relaxation exercises, mindfulness-based stress reduction (MBSR), antioxidants, multivitamins, meditation, and finally, yoga, visualization/guided imagery, and calcium (see Table 3).

Barriers to Using CTs

Across all CT categories, the largest deterrent to use was not knowing what a therapy was (13.6%), followed by not having enough evidence concerning whether a therapy worked (12.2%). Some also identified financial expense

Table 2. Demographic and Disease Characteristics.

Characteristic	n	Percentage
Sex		
Female	95	51.5
Male	101	48.5
Marital status		
Married	137	69.2
Single	23	11.6
Divorced	15	7.6
Common law	11	6.1
Widowed	9	4.5
Separated	2	1.0
Visible minority	20	10.3
Fluent in second language	32	15.0
Employment status		
Retired	75	38.3
Full-time	52	26.5
Disability	38	17.9
Unemployed	14	7.1
Part-time	10	5.1
Other	10	5.1
Tumor type		
Other	48	22.6
Breast	34	16.0
Lung	31	14.6
Lymphoma	26	12.3
Head and neck	20	10.6
Skin	15	7.1
Gastrointestinal	10	4.7
Leukemia	10	4.7
Colorectal	9	4.2
Prostate	9	4.2
Stage of cancer		
1	9	4.7
2	23	12.0
3	22	11.5
4	60	31.4
Unsure/NA	77	40.3
Stage of treatment		
Pretreatment	14	7.3
In treatment	103	53.6
Posttreatment	59	30.7
Treatments received		
Chemotherapy	127	59.9
Surgery	94	44.3
Radiation	82	38.7
Hormone	38	17.9

(4.8%) and difficulty with access (4.4%) in terms of the time and place that therapies were offered, as reasons preventing them from use. A minority perceived lack of support from doctors and health care professionals (1.4%) or from family and friends (0.3%).

Predictors of Interest in Specific CTs

Spearman correlations showed that greater interest in all CTs was significantly correlated to higher PS, except for cannabis. Interest in several biological therapies also increased as nausea decreased (vitamin D, C, E, B12, multivitamins, calcium, and flax). Several other indicators, including pain, fatigue, depression, and anxiety were correlated with higher interest in specific therapies (see Table 4).

When significant demographic and predictor variables were entered into the logistic regression model, however, PS remained the only significant predictor for the vast majority of CTs, along with nausea for some. Nagelkerke's pseudo R^2 value showed that the average variance accounted for by these models ranged from 9% for herbs to 45% for acupuncture.

Clinical Practice Guidelines for CTs

Clinical practice guidelines advising HCPs if, when, and how specific CTs should be used in oncology were sought for the 5 therapies with highest interest levels and highest use. Searches were conducted on the websites for American Society of Clinical Oncology (ASCO), US National Cancer Institute (NCI), Society for Integrative Oncology, and Cochrane Reviews. Included in the search but not represented in Table 5 were the following: The Canadian Medical Association and American College of Physicians because there were no relevant guidelines available to the public, and the NCCIH because it referenced the same guidelines as NCI. Across 4 regulatory bodies, massage and MBSR had specific treatment recommendations.[26-28] However, inconclusive evidence and an overall lack of guidelines was common, especially for vitamins and supplements. Some websites were organized by symptom or cancer type and offered complementary or mind-body therapies as a final alternative for symptom control but did not advise on the use of specific CTs (ie, ASCO), and others offered recommendations of CT use for only certain tumor groups (see Table 5).

Discussion

Survivors' Use of and Interest in CTs

Use of Specific CTs. The most frequently used CTs were predominantly biologically based, including vitamins, minerals, fish oil, and green tea but not herbs. Next highest were massage and several mind-body therapies (eg, yoga, meditation, MBSR). These findings are akin to previous research, in that vitamin supplements and diet-based therapies were used most often by survivors.[29,30] Massage was also reported in some studies; however, mind-body therapies were usually the next most frequently used CT after biological therapies.[31-33] Biologically based therapies may have the highest levels of use because information about them is readily

Table 3. Cancer Survivors' Use and Level of Interest in Each CT.

Use of CTs (%)		Interest Among Non-CT Users Mean (SD)		
Vitamin B12	75.2	Massage	3.18	(2.24)
Vitamin D	48.6	Vitamin B12	3.14	(2.01)
Multivitamin	31.6	Breathing/Relaxation	3.13	(2.05)
Calcium	30.0	MBSR	2.97	(2.05)
Breathing/Relaxation	29.0	Antioxidants	2.90	(1.99)
Vitamin C	24.3	Multivitamins	2.89	(2.03)
Green tea	23.8	Meditation	2.85	(2.18)
Massage	22.7	Yoga[a]	2.83	(2.11)
Meditation	21.4	Calcium[a]	2.83	(1.93)
Fish oils	21.0	Visualization[a]	2.83	(2.03)
Yoga	17.7	Vitamin E	2.82	(1.97)
MBSR	16.3	Green tea[a]	2.79	(1.91)
Chiropractor	15.2	Vitamin C[a]	2.79	(1.99)
Cannabis	14.4	Vitamin D	2.77	(2.03)
Antioxidants	13.5	Flax[a]	2.71	(2.93)
Visualization	13.4	Selenium[a]	2.71	(1.95)
Creative therapies	12.8	Fish oil	2.70	(1.93)
Herbs	12.4	Cannabis	2.69	(2.18)
Flax	11.9	Herbs	2.66	(1.97)
Melatonin	11.4	Acupuncture	2.61	(1.95)
Acupuncture	10.5	Melatonin	2.60	(1.81)
Naturopathy	9.5	Naturopathy	2.55	(2.00)
Reiki	8.5	Mushrooms	2.47	(1.89)
Vitamin E	8.1	Creative therapies[a]	2.45	(1.85)
Tai Chi/Qigong	7.6	Tai Chi/Qigong[a]	2.45	(1.90)
Homeopathy	6.2	Reiki	2.40	(1.83)
Selenium	4.3	Homeopathy	2.38	(0.84)
Mushrooms	3.8	Osteopathy	2.33	(1.84)
Osteopathy	1.9	Chiropractor	2.30	(1.87)
Hypnosis	1.4	Hypnosis	2.20	(1.77)

Abbreviations: CT, complementary therapy; MBSR, mindfulness-based stress reduction.
[a]Tied.

available and advertised through the media. They are also easier to take part in than other modalities (eg, buying supplements vs attending a yoga class) and may have less social stigma attached to them.

Overall Interest in CTs. Our low average interest in CTs across the board was contradictory to previous trends in the literature. Many survivors reported low or no interest in CTs; however, these often tended to be the same people who were already using some CTs. In other words, those who were already using CTs and likely satisfied with the outcomes were not interested in exploring many others. Indeed, up to 75% of the sample were already using at least 1 CT, which is similar to the rates reported in other studies. Hence, it may not be surprising both that the CT-using group were satisfied and the others were not highly interested in trying CTs.[3]

Interest in Specific CTs. The CTs that nonusing survivors identified interest in did not map directly on to therapies

that the CT-using sample had tried. Mean interest across categories was not concentrated in biological therapies but spanned across several categories, including massage, vitamin B12, breathing/relaxation, MBSR, antioxidants, multivitamins, and meditation. A key difference between this list and the most highly used therapies was the addition of antioxidants. Cancer survivors are often interested in using antioxidants such as vitamin C or E because they are known to bind to free radicals, which are increased during radiotherapy and chemotherapy, thus reducing oxidative stress and protecting healthy cells in the body.[34] Because more than half of our sample was in active treatment, this may have motivated their interest; however, there is conflicting evidence regarding the safety or usefulness of taking antioxidants during treatment.[35] Some have found that high doses reduce treatment toxicity in normal cells and even enhance the efficacy of treatment in cancer cells, whereas others have shown that antioxidants may protect cancer cells against radiation damage.[36] Thus, HCPs often advise

Table 4. Correlations for Therapies with Multiple Significant Predictors.[a]

	Cannabis	Acupuncture	Yoga	Naturopathy	Chiropractor
Perceived stress	0.21*	0.27**	0.33**	0.22*	0.22*
Depression	0.19*	0.14*	0.20*	0.09	0.13
Anxiety	0.13	0.19*	0.22*	0.21*	0.23*
Fatigue	0.23*	0.16*	0.06	0.18*	0.18*
Pain	0.08	0.20*	0.02	0.18*	0.14*
Shortness of breath	0.03	0.10	0.02	0.18*	0.11

[a]All therapies with 3 or more significant correlations are reported; *$P < .05$, **$P < .001$. Numbers indicate correlation coefficients.

Table 5. Availability of Physician Guidelines for High-Interest and High-Use Therapies.[a]

	American Society of Clinical Oncology	National Cancer Institute	Society for Integrative Oncology	Cochrane Reviews
Massage		Y	Y	Y
Mindfulness-based stress reduction	*	Y	Y	Y
Antioxidants		*	*	Y
Vitamin B12				
Vitamin D		*		
Multivitamin				Y
Calcium		*		Y
Breathing/Relaxation	*		Y	

[a]Y = yes, specific guidelines are available on website. *Indicates literature reviews are available, but data are deemed insufficient for the development of guidelines; blank indicates that no specific guidelines or literature reviews were available.

cancer survivors not to take any antioxidants, which could result in unsafe practices for those still interested in taking antioxidants. This gap has important implications—namely, that guidelines need to be established for HCPs to ensure that accurate and consistent information is being given to survivors. The differences between interest and use may also be explained by some of the barriers experienced.

Barriers to CT Use

As noted previously, the ranking of barriers for each therapy was different. However, across all categories, lack of knowledge concerning what a therapy was and lack of evidence were the largest barriers to use, similar to what we found in a previous study.[16] People identified reiki, vitamins and herbs, and cannabis most often for not knowing what they were. Similarly, the need for evidence was highest for vitamins/herbs, cannabis, and acupuncture. It is interesting to note that vitamins and herbs, the most frequently used and seemingly commonplace therapies, still evoked uncertainty. People required more information to adequately understand what these CTs could or could not achieve and whether they wanted to use them. These findings highlight the need for continued efforts in providing access to information for survivors.

Difficulty with access and finance were not rated very frequently; however, they followed patterns established in the literature.[16] Accessing CTs at different times and locations was a problem for CTs that involved organized classes such as tai chi, meditation, and creative therapies. Expense was a barrier for massage, chiropractors, and osteopathy as well as acupuncture and cannabis.

Only a handful of survivors reported a lack of support from doctors, in contradiction to previous literature that showed that HCPs were often hesitant to discuss CTs because of lack of expertise, perceiving CTs as unscientific, lack of time, or not knowing which HCP's responsibility it was to cover such material.[37,38] As a result, in other studies, cancer survivors have reported feeling that their HCPs were unable or unwilling to support them in making decisions about CT use.

Predictors of Interest

Perceived Stress. PS was a significant predictor across all CTs, in that higher PS was linked to higher levels of interest. This relationship may be explained by the unique stressors faced by cancer survivors. Past studies have shown that survivors experience severe and acute stress at diagnosis, and though this may taper off, it is often still present throughout treatment and into recovery.[39] Survivors must grapple with the sudden existential distress of their disease and the effects of treatment while also adapting to changing roles and identities in relationships, families, and work.[40]

All these influence perceptions of stress and control over one's life and have been theorized to drive people toward using CTs as an active coping mechanism.[40]

Spiritual Well-being. This was measured by the FACIT-Spirituality Scale and was not related to interest for any CTs, contrary to our expectations. Previously reported elevated use of spiritual practices after cancer diagnosis led us to believe that it may be a driving factor for CT interest.[41,42] Our negative findings may be the result of low overall spirituality in our sample because some participants did not complete the survey, at times commenting that spirituality was not relevant to them. For those who did complete the survey, their mean spirituality scores ($X = 27.85$) were lower than reported norms for cancer populations ($X = 37.35$).[43] It is also possible that spirituality is more relevant to some populations than others (ie, for some populations, spirituality is a part of their culture or religion and plays a larger role in shaping cognitions and affect than others).[44] Although we did ask about ethnicity, the majority of our sample was Caucasian; thus, we could not examine differences in spirituality between cultural groups. Future studies may benefit from looking into spiritual and existential distress in more depth and inquiring about the role of culture and faith-related values to establish these relationships.

Therapies With Unique Predictive Profiles

Several therapies were highlighted previously for being correlated to multiple predictors, and these relationships may allude to reasons for use. Below, we explore in greater detail a subset of therapies that had relatively high reported interest, which may be meaningful targets for future research (see Table 4).

Cannabis. Interest in cannabis had many predictors, including high PS, overall physical symptoms, depression, and fatigue. Higher levels of each of these were associated with greater interest in cannabis. It is unclear whether cannabis could help treat these symptoms, although some evidence shows that cannabinoids are effective in reducing anxiety and negative mood symptoms compared with placebo, justifying the appeal for those with negative mood symptoms.[45-47] However, few studies have examined this relationship, and other findings suggest that cannabinoids are also capable of increasing anxiety.[47] Cannabinoid use as a long-term strategy for control of anxiety and depression has not been studied.

Interestingly, there was no relationship between reduced appetite, increased nausea, or increased pain and higher interest in cannabis as those relationships have been extensively studied in recent years. Systematic reviews and meta-analyses have shown that cannabinoids (such as nabilone, dronabinol and synthetic analogs such as levonantradol) are more effective antiemetics than conventional treatments or placebos.[45,48-51] In addition to reducing sensations of nausea, THC can also stimulate appetite to reduce the chronic weight loss that often accompanies treatment. In terms of pain relief, analgesic effects superior to placebos and comparable to codeine have been found,[52] and researchers recommend that it be used to alleviate moderate neuropathic pain in cancer survivors.[49,53]

Yoga. Increased anxiety, depression, and PS were correlated to higher interest in yoga. This relationship between mood symptoms and yoga is evidenced by several recent studies. A systematic review of 13 randomized controlled trials for yoga in cancer survivors reported large reductions in psychosocial distress, including anxiety and depression.[54] Clinically significant changes in well-being also had small to medium effect sizes compared with controls, showing promise for the effects of yoga.[55] The psychological benefits of yoga often outweighed other factors in terms of effect size; however, the physical benefits of regaining strength, flexibility, and balance were also significant. As a mindbody therapy, its reported benefits include physical strengthening, increased body satisfaction, less mood disturbance, improved emotional well-being, lower global stress scores, increased quality of life, and occasionally, improvements in sleep quality.[56]

Acupuncture. This was another therapy with many significant predictors, such as PS, overall physical symptoms, pain, fatigue, depression, and anxiety. Indeed, several of these predictors are symptoms that may respond well to acupuncture treatment. Chronic pain in cancer survivors is often not alleviated by conventional treatments and is the most common reason acupuncture treatment is sought. A recent meta-analysis reported that 9 out of 11 clinical trials showed decreases in survivors' perceived pain after acupuncture treatment.[57] Cancer-related fatigue can also be debilitating and is often not eliminated by conventional recommendations of rest. A recent study found a nearly 30% improvement in survivors' self-reported chronic fatigue after using acupuncture for several weeks.[58] A randomized controlled trial also found significant improvements in fatigue as well as mood symptoms in breast cancer survivors.[59] Despite this, a meta-analysis cautioned that further research is needed.

In terms of mood symptoms, several studies have reported positive outcomes for anxiety and depression or mood disturbance in general. However, it has not been extensively studied and could be a result of the pain or fatigue reduction. In addition to symptoms in the current study that were linked to interest in acupuncture, it has also been reported to be beneficial and clinically safe for nausea, dry mouth, hot flashes, and improving sleep quality; however, further study is needed to establish efficacy in these areas.[60]

Availability of Physician Guidelines

We can see from the above that for some therapies, the correlation between interest in a particular CT and symptoms (ie, using acupuncture for pain) have been extensively studied, whereas for other CTs, it has not (ie, cannabis for depression). Despite this, belief that the CT may help alleviate these symptoms may be the reason survivors use specific CTs. The question then is, do we have established guidelines for physicians to follow when asked about these CTs to help manage specific symptoms? We reviewed the top 5 CTs with the highest interest and use rates to see if clinical practice guidelines or recommendations were available for HCPs (see Table 5).

It is evident from the paucity of guidelines for CT use that we need further efficacy trials delineating the benefits and risks of these CTs and a sustained effort to keep HCPs up to date with best practice in integrative oncology.

Limitations and Future Directions

The findings of our study should be evaluated in light of several limitations. The use of short questionnaires in a waiting room can be advantageous, in that it can achieve a more representative sample than more burdensome study designs that attract highly interested, perhaps biased samples. However, because of time limits, brief instruments were used, which may have limited our ability to accurately assess the constructs we were measuring and in turn the amount of variance accounted for by our models. Our survey also lacked attention-check questions; thus, we could not filter out respondents who answered carelessly. It should also be noted that our small subgroups from each tumor type may have limited findings, such as differences in interest between tumor groups, which have been found previously. Finally, transforming the interest variable from continuous to categorical led to some loss of information and may have decreased power in the analyses. It should also be noted that our predictive models were based on correlational cross-sectional data, and hence, no causal claims can be made regarding these relationships.

Our first recommendation would be replication of this type of survey in other samples because some of the predictors were not significantly correlated to interest in CTs, in contrast to previous research. More specifically, we recommend exploring these relationships using more thorough instruments and more predictor variables. This study provides a blueprint for which therapies to focus our attention on in the future. Those CTs with high interest or use ratings should be further studied to elucidate what symptoms they may help manage and how, as well as under what conditions optimal benefits are seen. Such knowledge will allow development of evidence-based guidelines for HCPs and the ability to provide tailored recommendations for survivors.

Conclusion

Survivors exhibited different profiles in terms of endorsing CTs. The most highly used therapies were predominantly biologically based; however, those who had not used CTs expressed interest in a wide range of CTs. Most demographic and disease-related characteristics were not significantly related to interest, in contrast with previous research. The contributions of existential or spiritual well-being and physical symptoms toward interest need further study because we found no significant relationships to spirituality and few for physical symptoms. Despite this, multiple significant predictors were found for therapies such as yoga, acupuncture, and cannabis. Survivors identified lack of knowledge and lack of evidence as primary barriers to access, and similarly clinical practice guidelines were lacking for many popular therapies. It is thus hoped that this study will inspire more rigorous trials into the efficacy of therapies in order to establish clear guidelines for physicians and survivors alike.

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