# Increasing the Oncology Nurse's Knowledge Base of Complementary and Alternative Medicine May Lead to Increased Patient Advocacy and Support: A Rural Setting

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## Introduction

According to the National Institute of Health (2008), approximately 38 percent of adults in the United States aged 18 years and over and nearly 12 percent of U.S. children aged 17 years and under use some form of complementary and alternative medicine (CAM). In the U.S. cancer population, CAM practices are widely-used, especially among women (Fouladbakhsh & Stommel, 2010). Research has shown that cancer patients are much more likely to use CAM therapies than the general population (Yong, 2013). According to Yates, et al. (2005), cancer patients often seek help outside the traditional Western medical model through CAM for aid in alleviating side effects and increasing quality of life. Per Rowland and O'Mara (2014), cancer survivors are already employing a menu of CAM practices to manage the chronic effects of treatment, reduce the risk of recurrence or secondary cancers, gain control over their lives, address comorbid conditions exacerbated by illness, and ultimately, improve their quality of life. While compared to the general population, cancer survivors are more likely to communicate the use of CAM with their providers. But even with this increased likelihood, the majority of CAM use still goes unreported. Communication of CAM use is an important area for improvement in patient centered care (Mao, Palmer, Healy, Desai, & Amsterdam, 2011). Oncology nurses can play a significant role with initiating communication with cancer patients regarding CAM use. For this to occur, Oncology nurses should be knowledgeable regarding CAM and should be able to provide unbiased, credible information to patients. However, a recent study conducted by The Nurse Oncology Education Program, found 'Complementary and Alternative or Integrative Medicine' to be the second most cancer related educational need among oncology nurses. This leads to the question as to whether or not an increase in knowledge regarding CAM among Oncology nurses would lead to an increase in communication and in turn lead to increased patient advocacy and support. Of particular interest was whether or not this increase in knowledge would impact practice in a small rural cancer center.

## Methods

A literature review of on-line journal articles, web-sites, books, and research studies was performed. Searches were primarily performed through ProQuest and PubMed. Topics included CAM and Cancer, CAM and Oncology Nurses, Nurses and Educational Needs, Integrative Medicine and Cancer, and CAM and chemotherapy. The literature review yielded a very interesting article published in 2009 in the Oncology Nursing Forum. Authors Rojas-Cooley & Grant (2009), conducted a study to assess the oncology nurses' CAM knowledge and attitudes. A validated instrument known as the Nurse Complementary and Alternative Medicine Knowledge and Attitude (NrCAMK&A) survey that had been previously developed by Rajas-Cooley was used for the data collection. In this study, a random sample of 850 oncology nurses was surveyed. These oncology nurses were members of the Oncology Nursing Society (ONS) and were direct care providers. Based on the responses, the authors concluded that assessing oncology nurses' CAM knowledge is important for developing appropriate educational programs that will help nurses support and advocate for patients.

M. Teresa Rojas-Cooley (author of the NrCAMK&A survey) was contacted via e-mail with a request to utilize the NrCAM&K survey in order to assess the knowledge and attitudes of Oncology nurses at a local cancer center. Rojas-Cooley responded providing permission to utilize the survey and provided a current, revised survey template for use. The cancer center being assessed was a small office located in rural eastern North Carolina. There were three physicians (board certified oncologists) on staff. Following an in-person meeting with the Nurse Practitioner, the survey was provided to her via e-mail. She then distributed hard copies to the clinical team which consisted primarily of oncology certified nurses and certified medical assistants. A survey was also completed by the nurse practitioner. The oncologists were not included. Fourteen surveys were completed and returned.

## Results

The findings from the NrCAM&K survey completed at the local level were similar to the findings reported by Rojas-Cooley and Grant (2009). Tables 1-3 represent the findings in regards to 'Knowledge and Attitude'. The knowledge section of the survey assessed terminology and categories of CAM. The attitudes section assessed beliefs, practices and roles. The local

nursing and CMA staff's knowledge level regarding definitions was higher than the 2009 survey but basic knowledge score was similar. Attitude assessment results varied as was the findings in the 2009 study. Of note, the local staff consistently indicated belief that patients have the right to have CAM therapies integrated into their conventional medical treatment and believe that patients are accountable for disclosing use of CAM therapies. However; as noted in Table 2, the responses were not quite as consistent when asked if it was believed it was the nurse's role to help integrate CAM therapies into patients' conventional treatments and whether it was believed the nurse was accountable for educating patients about CAM therapies. Table 3 clearly indicates a leading barrier to communication among patient and healthcare team members is a lack of knowledge.

As part of the survey, participants were asked to circle/underline resources currently being used or used in the past to learn about or to provide information to patients. The following were indicated as being used: books, professional journals, patients, nurses, physicians, advertisements, social workers, dieticians, American Cancer Society (ACS), and National Cancer Institute (NCI). Only 2 participants indicated the use of ONS and only 1 participant indicated the use of National Center for Complementary and Alternative Medicine (NCCAM). No participants indicated the use of University Websites, Natural Standards Database, or the Natural Medicine Comprehensive Database.

The current version (v.6) of the NrCAM&K survey utilized is more current than the survey used in 2009. Both surveys incorporated terminology used by NCCAM. However NCCAM has revised their terminology and subgroups since 2009 and the newer survey reflects these changes.

**Table 1**

| Knowledge | # of Responses | # Correct Responses | % Correct Responses |
|---|---|---|---|
| **Definitions (Complementary Medicine, Alternative Medicine, Complementary Health Approaches)** | | | |
| Complementary Medicine | 14 | 13 | 93% |
| Alternative Medicine | 14 | 14 | 100% |
| Complementary Health Approaches | 14 | 13 | 93% |
| **SubGroups (Natural products / Mind-Body Practices)** | | | |
| Mind Body Practice<br><br>4 questions | 55 | 41 | 75% |
| Natural Products<br><br>3 questions | 42 | 30 | 71% |

| Table 2 | | | | | |
|---|---|---|---|---|---|
| **Attitudes (Beliefs / Practices / Roles) Table 2** | | | | | |
| • **Belief Related** | **Strongly Agree** **Strongly Disagree** **1** | **2** | **3** | **4** | **5** |
| -I believe that CAM Therapies have a role in my practice | 3 | 4 | 3 | 2 | 1 |
| -I believe patients have the right to have CAM therapies integrated into their conventional medical treatment | 7 | 4 | 2 | 0 | 0 |
| -I believe patients are accountable for disclosing use of CAM therapies | 9 | 1 | 3 | 0 | 0 |
| -I believe I am accountable for assessing patients for CAM Therapy use | 6 | 4 | 2 | 1 | 1 |
| -I believe CAM education is important for my practice | 4 | 5 | 3 | 4 | 0 |
| -I believe it is my role to help integrate CAM therapies into patients' conventional treatments | 3 | 4 | 4 | 1 | 1 |
| -I believe I am accountable for educating patients about CAM therapies | 1 | 3 | 7 | 0 | 2 |
| -I believe it is important for my workplace to integrate CAM into practice | 2 | 5 | 5 | 1 | 0 |

| • **Practice Related** | **Strongly Agree** **1** | **2** | **3** | **4** | **Strongly Disagree** **5** |
|---|---|---|---|---|---|
| -I assess my patients for CAM use | 0 | 2 | 4 | 4 | 3 |
| -I am comfortable in assessing my patients for CAM use | 0 | 0 | 6 | 4 | 3 |
| -I am comfortable in answering questions my patients have about CAM | 0 | 1 | 5 | 3 | 4 |
| -I can easily find CAM reputable resources for my patients | 0 | 1 | 7 | 1 | 4 |
| • **Role Related** | **Strongly Agree** **1** | **2** | **3** | **4** | **Strongly Disagree** **5** |
| -I am familiar with my Board of Nursing CAM advisory statement | 0 | 0 | 3 | 2 | 8 |

N = 13

Note: Scores range from 1 (strongly agree) to 5 (strongly disagree)

| **Table 3** |
|---|
| **Responses** |
| **What are your barriers to CAM communication with your patients?**<br>• Time<br>• Lack of knowledge |

- Lack of understanding
- Basic Information
- Doctors acceptance of and position on CAM
- Local resources
- Lack of education for patients
- Not much available in the area

What are your barriers to CAM communication with healthcare team workers?

- Not primary focus
- Personal lack of knowledge
- No education / If we knew more about it we would be more likely to discuss it amongst each other
- Preconceived prejudices against CAM
- Lack of examples of evidenced base practice in CAM
- Time constraints

Comments

- "I would love to learn more about CAM and see more used in our practice and in society in general"
- "The biggest problem we have run into with herbal drugs and vitamins is how some can interact with treatment"

The NrCAM&K survey also addressed which CAM therapies patients most often asked about and which CAM therapies patients most often disclosed. The specific CAM therapies questioned are indicated in Table 4. The survey indicated the CAM therapies patients asked about most often and most often disclosed were the same. These therapies were: Prayer, Meditation, dietary supplements, herbs, special foods, vitamins, probiotics, chiropractic, yoga, and massage. The survey instructed the clinical team to check which of the CAM therapies in Table 4 for which they were interested in learning. Results included: Naturopathic Medicine, Traditional Chinese Medicine, Homeopathic Medicine, meditation, art therapy, herbs, special foods, dietary supplements, music therapy, yoga, Tai Chi, biofeedback, imagery, massage, chiropractic, cranial sacral, osteopathic manipulation, Qi Gong, Reiki, and therapeutic touch.

**Table 4**

| **Specific CAM Therapies** | | | |
|---|---|---|---|
| Naturopathic Medicine | Art Therapy | Special foods / diets | Cranial Sacral |
| Traditional Chinese Medicine | Music Therapy | Vitamins | Osteopathic Manipulation |
| Homeopathic Medicine | Tai Chi | Probiotics | Qi Gong |
| Ayurvedic Medicine | Hypnosis | Dietary Supplements | Reiki |
| Yoga | Imagery | Other: Specify | Therapeutic Touch |
| Meditation | Biofeedback | Chiropractic | Magnet Therapy |
| Prayer | Herbs | Massage | |

Based on the results of this NrCAM&K survey, a clear learning need was indicated and the nursing staff was receptive to having a CAM presentation conducted. It was agreed the presentation would be delivered during an upcoming staff meeting. Based on the availability of the clinical team, a one hour presentation on CAM was developed and presented. This presentation was delivered via power point and was entitled; 'CAM and Cancer Care, an overview'. The selected objectives of the presentation were adapted from Cuellar, Cahill, Ford and Aycock's (2003) journal article titled 'The Development of an Educational Workshop on Complementary and Alternative Medicine: What Every Nurse Should Know. The objectives were revised to meet the one hour presentation time limit. The objectives are noted in Box 1

| Box 1\| Presentation Objectives |
| --- |
| 1. List common terms used when defining CAM<br>2. Discuss the history of CAM<br>3. Discuss use of CAM among cancer patients<br>4. Identify those most likely to use CAM<br>5. Describe advantages / disadvantages of CAM<br>6. Discuss how assessment skills can be improved when identifying the use of CAM in patients<br>7. Identify reliable resources |

Evaluations forms were distributed. The forms were collected the day after the presentation allowing adequate time for completion. Results are noted in the Conclusion section.

## Discussion

The discussion section below contains information related to the seven stated objectives in Box 1

So what exactly is CAM and what are CAM therapies? The terms themselves can lead to confusion among both nurses and patients. These factors could be contributing to such a wide range of patients reporting the use of CAM therapy, as CAM therapies may mean different things to different people. According to Micozzi (2011), much of what we call 'complementary and alternative' medicine in the United States, in fact, represents time honored traditions of medical practice originating in other countries and other cultures or during earlier periods of European and American society. Examples are Traditional Chinese Medicine and Ayurvedic Medicine. Some of these practices have now become mainstream while others are still considered CAM.

In 1992, NCCAM was established to facilitate study and evaluation of CAM practices and to disseminate the resulting information to the public. NCCAM is the Federal Government's lead agency for scientific research on the diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine. NCCAM is part of the National Institutes of Health (NIH). NCCAM is currently using the following definitions and terms:

- "Complementary" generally refers to using a non-mainstream approach **together with** conventional medicine.
- "Alternative" refers to using a non-mainstream approach **in place of** conventional medicine.

Per NCCAM's website (2014), NCCAM generally uses the term "complementary health approaches" when discussing the practices and products they study for various health conditions. NCCAM currently uses two main subgroups to describe complementary health approaches. Much of the literature review revealed studies from a time when NCCAM used four to five categories. These two subgroups currently used are 'natural products' or 'mind and body practices'. Natural products would include a variety of products, such as herbs, vitamins and minerals, and probiotics. Mind and Body practices include acupuncture, massage therapy,

meditation techniques, movement therapies, relaxation techniques, spinal manipulation, Tai Chi, Qi Gong, healing touch, hypnotherapy, and yoga. It should be noted that on December 17, 2014, the NIH press released the announcement that NCCAM would now be the known as the National Center for Complementary and Integrative Health (NCCIH).

Of particular interest in the oncology setting is the Office of Cancer Complementary and Alternative Medicine (OCCAM). OCCAM was created due to the interest in CAM within the National Cancer Institute (NCI). It was created in 1998 by NCI senior leadership. The mission of OCCAM is to coordinate and enhance activities of the NCI in CAM research as it relates to the prevention, diagnosis, and treatment of cancer, cancer-related symptoms, and side effects of conventional cancer treatment. Like NCCAM, OCCAM is also part of the NIH. OCCAM however, uses different terminology / categories of CAM. OCCAM defines CAM in the following manner (National Cancer Institute 2012):

- **Complementary and alternative medicine (CAM):**Any medical system, practice, or product that is not thought of as standard care
- **Complementary Medicine:** A CAM therapy used **along with** standard medicine
- **Alternative Medicine:** A CAM therapy used **in place of** standard treatments
- **Integrative Medicine:** An approach that combines treatments from conventional medicine and CAM for which there is some high-quality evidence of safety and effectiveness

OCCAM uses the following eight categories:

- Alternative Medical Systems: Examples – Ayruvedic medicine, Naturopathic Medicine, Homeopathy
- Energy Therapies: Examples – Qi Gong, Reiki, Therapeutic touch
- Exercise Therapies: Examples –Tai Chi, Yoga asanas

- Manipulative and Body-based Methods: Examples – Chiropractic, Therapeutic massage, Reflexology
- Mind-body Interventions: Examples – Meditation, hypnosis, art therapy, imagery, aromatherapy
- Nutritional Therapeutics: Examples – Macrobiotic diet, vegetarianism, vitamins, antioxidants
- Pharmacological and Biologic Treatments: Examples – Antineoplations, laetrile, melatonin
    - (Subcategory) Complex Natural Products: Examples – Herbs and herbal extracts, mixtures of tea polyphenols
- Spiritual Therapies: Examples – Prayer and Spiritual Healing

Through the literature search, Oncology Nursing Society (ONS) publications were found to mainly use NCCAM's terminology although OCCAM's were also noted. In Decker & Lee's book, 'Handbook of Integrative Oncology Nursing Evidence-based Practice' which was published by ONS, OCCAM's terminology is utilized. The Society for Integrative Oncology (SIO), formed by clinicians, researchers and patient advocates, also uses OCCAM's terminology. However, the American Holistic Nurses Association position statement regarding CAM uses the following categories: Whole Medical Systems, Mind-Body Medicine, Biologically Based Practices, Manipulative and Body Based Practices, and Energy Medicine. These are the five categories previously utilized by NCCAM.

The NrCAM&K survey was developed based on NCCAM's definitions and categories. The varying definitions and categories were presented to the local Oncology staff for awareness purposes as "there is a lack of clarity about what exactly what is considered CAM therapy, as this is a continually evolving term" (Yates, et al 2005). Within the ONS position paper on 'The use of Complementary, Alternative, and Integrative Therapies in Cancer Care, it states, "It is the position of ONS that Oncology nurses have an awareness of the differences among terms applied

to complementary, alternative and integrative therapies and use the terms with consistency and in the appropriate context" (Oncology Nursing Society 2009).

In addition to understanding CAM history, terms and definitions, it is also important for oncology nurses to be aware of the most commonly used CAM therapies in Oncology and the predictors of CAM use. Yates, et al (2005) reported a 91% (n=686) use of at least one CAM therapy during cancer treatment. In this study the most widely used forms of CAM therapies were prayer, relaxation and exercise. In this study, specific CAM therapies asked about were exercise, prayer, relaxation, chiropractic, massage, imagery, spiritual healing, diets, herbal medicine, mega-vitamins, self-help groups, hypnosis and acupuncture. In a study conducted by Mao, Healy, Desai, Amsterdam & Palmer (2011), it was found that 43% (n=1471) of cancer patients had used CAM therapy in the past 12 months. In this study the most widely used forms of CAM were Chiropractic/osteopathic, herbs, massage, deep breathing, meditation and acupuncture. This study utilized what at the time was considered NCCAM's five categories and included a lengthy list of CAM therapies for participants to select. The terms 'exercise' and 'prayer' were not included. In 2013, a study published by Parker et al., reported that approximately 40% (N=650) of cancer patients reported using CAM therapies after diagnosis. NCCAM's five categories were also used in this study however the study did not include prayer or psychotherapy. In a small study of cancer patients in a radiation oncology practice (n= 153) CAM was reported in 95% of the participants (Rausch, Winegardner & Kruk, 2010). The most frequently reported CAM therapy was spiritual healing/prayer at 62.1%. Other therapies reported were multivitamins, herbs and dietary supplements. Prayer was also the most frequently reported CAM therapy in the local NrCAM&K survey. As CAM terminology evolves perhaps there will be more consistency within research studies when determining the use of CAM therapies.

Identifying characteristics of patients who chose to use CAM, either as a supplement to conventional cancer care or as an alternative, is vital in preserving quality care and maximizing positive health outcomes (Fouladbakhsh, Strommel, Given & Given, 2005). A 2010 study published by Fouladbakhsh and Strommel, found that CAM use was more prevalent among female, middle-aged, caucasion, and well-educated subjects. Other studies have also shown a

higher use of CAM in women when compared to men. Although studies show a wide range in regards to the percentage of cancer patients using CAM therapies, it is well documented that there is an upward trend. It is also possible that if prayer is included as a CAM therapy, the percentage of CAM therapy used will be reported to be higher.

A clinical challenge is that 40%-77% of CAM use remains undisclosed because of patients' beliefs that these therapies are natural and safe to use, concern that providers may react negatively, or simply, providers do not ask about their use (Robinson & McGrail, 2004). But, providers should be asking patients about their use CAM therapies. Specifically, 'Oncology nurses' should be asking patients about their use. It is part of the Oncology Nursing Society's position that:

- Oncology nurses assess patients for the use of CAM therapies and provide evidenced based information and resources as well as information about varying practitioner's qualifications and credentials.
- Oncology nurses document patients' use of and potential response to complementary, alternative, and integrative therapies.

Nurses should possess a basic knowledge of CAM practices to safely assess, intervene in, and evaluate patient outcomes based on healthcare practices (Cuellar, Cahill, Ford & Aycock, 2003). However, as stated in the introduction, the Nurse Oncology Education Program found 'Complementary and Alternative or Integrative Medicine' to be the second most cancer related educational need among oncology nurses. Many patients believe that CAM therapies are harmless so it is of particular importance that oncology nurses be aware of CAM therapies that can potentially interfere with the outcome of other cancer treatments. There are multiple herbal medications and dietary supplements that have been safely used for many years. However there is limited research on these therapies among cancer patients. Of great importance are the safety concerns regarding herb-drug interactions. Evidence has shown that certain popular herbal medicines can affect the metabolism of anti-cancer agents via cytochrome P450 (CYP) and/or P-glycoprotein induction, and such interactions often lead to increased toxicity and/or sub-therapeutic effects (Yong, 2013). A common example is St. John's Wort, which has been shown

to lower the efficacy of irinotecan. Interactions between herbal supplements and chemotherapy agents may also leave cancer patients at risk for hepatotoxicity. There are also certain herbs/natural products having the potential to increase cancer growth or recurrence. Some common examples include Black cohosh, Flaxseed, Milk Thistle, Star Anise and high dose Vitamin C (Decker & Lee, 2010). Effective communication between nurses and cancer patients is necessary to identify and minimize the risk of negative interactions.

In order for effective communication to occur between nurses and cancer patients, not only do nurses need to be knowledgeable regarding CAM therapies, but nurses should also effectively asses their patients for CAM use on an ongoing basis. Assessment should include a non-biased direct inquiry. It is important the cancer patient feel comfortable with disclosing the use of or interest in CAM therapies. According to Kapel & Johnson (2014), direct inquiry may not always lead to a patient revealing their use of CAM therapies as patients may not think of the products and therapies they use as being defined as a CAM therapy. Therefore; it is important that patients be asked about the use of CAM therapies multiple times and in multiple formats for an accurate assessment to be obtained. Following inquiry regarding the use of CAM therapy, nurses should follow a three step process when discussing CAM with their patients. The first step is to provide education. The second step is to facilitate patient learning by directing patients to scientifically sound resources of information and the third step is to assist patients with sorting through the information they have gathered and respond to any questions they may have (Smith, 2005).

According to Gobel, Beck and O'Leary (2006), oncology nurses must seek out evidence so they can provide the best possible care for patients and their families. The Oncology Nursing Society's position regarding CAM therapies recommend that only credible resources and evidenced-based recommendations be used. However, the results from the local NrCAM&K survey note lack of knowledge regarding available resources. Staying abreast of current CAM therapy research findings can be challenging for the oncology nurse. In order to assist the local nurses with locating current evidence-based information on cancer and CAM therapies, the list in Table 5 was comprised and a copy provided to each attendee.

| Table 5 | |
|---|---|
| **Credible Resources on CAM Therapy** | |
| **Agency** | **Website** |
| American Cancer Society | http://www.cancer.org |
| OCCAM | http://cam.cancer.gov/about_us.html |
| NCCAM | http://nccam.nih.gov/ |
| Society for Integrative Oncology | http://www.integrativeonc.org/index.php/docguide |
| ONS | https://www.ons.org |
| American Holistic Nurses Assoc. | http://www.ahna.org/ |
| MD Anderson Cancer Center: Integrative Medicine Department | http://www.mdanderson.org |
| Arizona Ctr. for Integrative Medicine | http://integrativemedicine.arizona.edu |
| Duke Integrative Medicine | http://www.dukeintegrativemedicine.org |
| Memorial Sloan Kettering Cancer Center – Integrative medicine | http://www.mskcc.org/cancer-care/integrative-medicine |
| Natural Medicines Comprehensive Database | http://naturaldatabase.therapeuticresearch.com |

## Conclusion

In conclusion, CAM therapy use is on the rise among cancer patients. However Cancer patients tend not to disclose their use of CAM therapy to their cancer healthcare team. For both safety and efficacy reasons, it is important for the oncology nurse to continuously assess patients for their use of CAM. Yet nurses tend not to raise the topic which seems to be related to a lack of knowledge surrounding CAM. The utilization of the NrCAM&K at a local cancer center revealed a lack of knowledge regarding CAM among the nursing staff being a primary barrier for communicating CAM with their patients. After attending an overview of CAM and cancer care presentation, the staff completed an evaluation form. Nine evaluations forms were returned to the presenter. As part of the evaluation form, one of the questions specifically asked whether the knowledge and information gained would lead to increased patient advocacy and support. All nine participants indicated 'YES'. When asked what changes might you make in regards to your nursing practice as a results of the presentation, some of the responses were: "ask questions about what herbs they use", "ask more patients about herbs and diet", "add evaluations about CAM to patient intake form", "better resources for patients", "more of what to add to patient assessments", and "will use resource list to further educate myself regarding CAM". This was a very small group of oncology nurses and the survey consisted of both nurses and certified medical assistance. However the responses to the evaluation forms which were only completed by nurses, does suggest that an increased knowledge base in CAM will lead to increased patient advocacy and support.

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Complementary and alternative medicine (CAM), any of various approaches intended to improve or maintain human health that are not part of standard medical care, also known as conventional, or Western, medicine. The various approaches of CAM typically are used in a manner that is complementary to.Â  However, partly because of the growing evidence base that supports the safety and efficacy of certain CAM approaches, some practitioners of conventional medicine have also become practitioners of CAM.Â  Consumers demanded increasing control over their own health, which led to the development of self-help and to the emergence of campaign groups that lobbied on behalf of health consumers and specific groups, such as the disabled and those afflicted by cancer and HIV/AIDS. Increasing the oncology nurses knowledge base of complemetary and alternative medicine may lead to increased patient advocacy and support: a rural setting. 2. Introduction. According to the National Institute of Health (2008), approximately 38 percent of adults in the United States aged 18 years and over and nearly 12 percent of U.S. children aged 17 years and under use some form of complementary and alternative medicine (CAM). In the U.S. cancer population, CAM practices are widely-used, especially among women (Fouladbakhsh & Stommel, 2010). Research has shown that cancer patients are muc