



Attitudes and beliefs regarding complementary and alternative medicine in a diverse gynecologic oncology patient population

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ABSTRACT

Objectives: To measure prevalence of complementary and alternative medicine (CAM) use in a diverse gynecologic oncology patient population and evaluate how attitudes and beliefs regarding CAM relate to demographic factors.

Methods: A validated Attitudes and Beliefs about Complementary and Alternative Medicine (ABCAM) survey was distributed to patients with gynecologic malignancy. Results were evaluated using Pearson's Chi-squared and Fisher's exact tests for categorical variables and Wilcoxon ranks sum and Kruskal-Wallis tests for non-normally distributed variables.

Results: One-hundred thirty patients completed the ABCAM survey. Self-reported race and ethnicity included Asian or Pacific Islander (n = 54; 42%), Hispanic/Latino (n = 23; 18%), White (n = 21; 16%), Black or African American (n = 20; 15%), American Indian/Alaska Native (n = 8; 6.2%) and Other (n = 4; 3.1%). Twenty-four respondents (18%) reported use of CAM. There was a significant difference in expected benefits to CAM between respondents of different ethnicities (p < 0.001). Black and Asian respondents reported greater expected benefit to CAM. Hispanic/Latino, American Indian/Alaskan Native, and White respondents reported fewer expected benefits. A significant association was found between perceived barriers to CAM and ethnicity (p 0.043), with Asian, Hispanic/Latino and White respondents perceiving more barriers while Black and American Indian/Alaskan Natives reported perceiving fewer barriers to CAM. Respondents with incomes greater than \$100,000 reported fewer barriers to CAM.

Conclusions: Use of CAM among gynecologic oncology patients is lower than previously thought. Income, race, and ethnicity inform patient engagement with CAM and can be used to better tailor the provision of evidence-based CAM interventions to benefit a greater number of gynecologic cancer patients.

1. Introduction

Complementary and alternative medicine (CAM) is the term used to describe medical products and practices that are not yet part of standard medical care. Per the National Cancer Institute, patients use CAM for several reasons including: (1) to help cope with the side effects of cancer treatments, (2) to provide comfort and ease their worries surrounding cancer treatment and related stressors, (3) to feel that they are exercising agency over their own care; and (4) to augment their cancer treatment or cure their disease (Complementary and Alternative Medicine. National Cancer Institute, 2022). The use of CAM is widespread among cancer

patients with an estimated 40% of cancer patients utilizing some form of CAM therapies (Horneber et al., 2012). For patients with gynecologic cancers, estimates of CAM use are even higher, ranging from 40 to 95% of patients utilizing CAM at some point during their cancer treatment (Abdallah et al., 2015; Akpunar et al., 2015; Nazik et al., 2012; Molasiotis et al., 2006).

CAM modalities include meditation, prayer, yoga, acupuncture, herbal medicines and supplements, massage, biofeedback, and the use of alternative medical systems, such as Traditional Chinese medicine or Ayurveda (Complementary and Alternative Medicine. Division of Cancer Prevention and Control, Centers for Disease Control and Prevention,

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2022). Historically, CAM treatments have occurred at best in parallel, and at worst at odds, with conventional medical treatments (Verhoef et al., 2008; Deng and Cassileth, 2013; Giordano et al., 2005; Andersen et al., 2013). Resistance to CAM often stems from concerns regarding adverse effects or interactions between CAM remedies and standard therapies, as well as a lack of scientific evidence supporting some CAM modalities (Ventola, 2010; Ernst, 2000; Jones et al., 2018). Despite the existing tension, there are a growing number of efforts in the medical community to incorporate CAM into both an evidence-based and holistic approach to oncology care (Mao et al., 2022; Viscuse et al., 2017; Deng and Cassileth, 2014; Segev et al., 2021; Witt et al., 2017).

Prior studies have suggested differences in CAM utilization based on race and socioeconomic status (Nahin et al., 2007; Ludwick et al., 2020). Among gynecologic oncology patients, CAM use has been shown to be more prevalent among patients of higher socioeconomic status (Abdallah et al., 2015; Swisher et al., 2002). However, the existing research is scarce and has been conducted in predominantly White patient populations. The relationship between CAM use and such demographic factors has yet to be studied in an ethnically, racially, and socioeconomically diverse gynecologic oncology patient population.

Our study seeks to elucidate both attitudes and beliefs surrounding CAM use in a diverse gynecologic oncology patient population using the validated ABCAM survey instrument (Mao et al., 2012). We seek to measure the prevalence of CAM use among our gynecologic oncology patient population and to evaluate how attitudes and beliefs about CAM use relate to demographic factors such as income and race.

2. Methods

This prospective cross-sectional survey study was approved by the Institutional Review Board. Patients presenting for care at a gynecologic oncology, medical oncology, or radiation oncology visit at Weill Cornell Medicine / New York Presbyterian Manhattan and Queens campuses in New York City between March 2017 and March 2018 were offered participation. Patients completed informed consent and were subsequently given the Attitudes and Beliefs about Complementary and Alternative Medicine (ABCAM) survey which they completed at the time of their visit. All patients receiving care for a gynecologic malignancy were eligible for participation. This included patients who had not yet received treatment, those who were currently receiving treatment, and those who had completed treatment for a gynecologic malignancy. ABCAM is a validated survey instrument used to predict CAM use, specifically in oncology patients (Mao et al., 2012). The ABCAM is a 15-item validated questionnaire divided into 3 domains: expected benefits, perceived barriers, and subjective norms regarding CAM use. Higher scores in each survey domain predict greater expected benefits to CAM use, greater barriers to CAM use, and more favorable norms regarding CAM use, respectively. The survey instrument was validated in English and the translated questionnaires were also used in Chinese, Korean, and Spanish.

The primary outcomes of this study were CAM use prevalence, association between ABCAM survey domain scores and CAM use, and associations between demographic factors and patient attitudes and beliefs regarding CAM in this population.

2.1. Statistical analysis

To evaluate if CAM use was associated with respondent demographics, Pearson's Chi-squared test and Fisher's exact test were used, as appropriate. To evaluate if ABCAM domain scores were associated with CAM use, Wilcoxon ranks sum test for non-normally distributed variables was used. To evaluate the association between ABCAM domain scores and patient demographics, Kruskal-Wallis test for non-normally distributed variables was used. Statistical significance was evaluated at the 0.05 alpha level, and 95% confidence intervals were calculated for all estimates. Data were analyzed using R Version

4.0.5 (R Foundation for Statistical Computing, Vienna, Austria).

3. Results

3.1. Patient demographics

One hundred and thirty patients completed the ABCAM survey. Most patients ($n = 67$; 52%) were between 50 and 70 years old. An income of less than \$30,000 per year was reported in 60% of patients ($n = 78$). Self-reported race and ethnicity included Asian or Pacific Islander ($n = 54$; 42%), Hispanic/Latino ($n = 23$; 18%), White ($n = 21$; 16%), Black or African American ($n = 20$; 15%), American Indian/Alaska Native ($n = 8$; 6.2%) and Other ($n = 4$; 3.1%). Sixty-three (48%) patients reported a college or higher education level. Forty-six (35%) patients had cervical cancer, 33 (25%) had uterine cancer, 29 (22%) had ovarian cancer, and 22 (17%) had vulvar/vaginal cancer. Forty patients (31%) were receiving treatment with chemotherapy or radiation at the time of survey response. There was no significant difference in reported CAM use based on patient age, income, education level, ethnicity, cancer type, reported family support, or current treatment type (Table 1).

3.2. ABCAM scores and CAM use

Among 130 patients, 24 (18%) reported using CAM. These patients reported higher scores for expected benefits compared with those not using CAM ($p = 0.009$). Patients using CAM reported higher scores for positive subjective norms surrounding CAM compared to patients not using CAM ($p = 0.004$). Patients using CAM reported fewer perceived barriers compared with patients not using CAM ($p = 0.002$) (Fig. 1A).

3.3. ABCAM subdomains and demographics

There was a significant difference in expected benefits to CAM between respondents of different ethnicities ($p < 0.001$). Black and Asian respondents reported greater expected benefits to CAM use while Hispanic/Latino, American Indian/Alaskan Native, and White respondents reported fewer expected benefits. There was a significant association between perceived barriers to CAM and ethnicity ($p = 0.043$). Asian, Hispanic/Latino and White respondents reported perceiving more barriers to CAM and Black and American Indian/Alaskan Natives reported perceiving fewer barriers to CAM. There was no significant difference in subjective norms among respondents of different ethnicities (Fig. 1B).

There were significant differences in perceived barriers to CAM use by respondent income ($p = 0.025$). Respondents with incomes greater than \$100,000 reported fewer barriers to CAM. There were no differences in expected benefits and subjective norms regarding CAM use among respondents of different household income levels (Fig. 1C).

Significant differences were found in the perceived barriers to CAM use by respondent report of family support. Patients without family support reported a significantly higher score for perceived barriers ($p = 0.009$). No differences in expected benefits or subjective norms scores among respondents with and without reported family support were observed (Fig. 1D).

There were no significant differences in expected benefits, perceived barriers or subjective norms among respondents with different gynecologic cancer types or patients receiving chemotherapy or radiation at time of the survey response (Supplement Tables 1-4).

4. Discussion

Our study shows a lower rate of CAM use among patients with gynecologic cancer than previously suggested, with just 18% of patients in our study reporting CAM use. Previous estimates of CAM use among patients with gynecologic cancer were greater than 40%. (Abdallah et al., 2015; Akpunar et al., 2015) This large difference in CAM use may reflect differences in which activities and therapies are defined as

Table 1
Patient demographics and CAM use.

Characteristic	Overall, N = 130 ¹	CAM Use, N = 24 ¹	No CAM Use, N = 106 ¹	p-value ²
Current	30.00	4.00	26.00	0.4
Chemotherapy	(23.08%)	(16.67%)	(24.53%)	
Current Radiation	10.00	1.00	9.00 (8.49%)	0.7
	(7.69%)	(4.17%)		
Family Support	111.00	22.00	89.00	0.5
	(85.38%)	(91.67%)	(83.96%)	
Age				0.5
18–30	2.00	1.00	1.00 (0.95%)	
	(1.54%)	(4.17%)		
31–50	28.00	6.00	22.00	
	(21.54%)	(25.00%)	(20.75%)	
50–70	67.00	11.00	56.00	
	(51.54%)	(45.83%)	(52.83%)	
>70	33.00	6.00	27.00	
	(25.38%)	(25.00%)	(25.47%)	
Income				0.4
<\$30,000	78.00	14.00	64.00	
	(60.00%)	(58.34%)	(60.37%)	
\$31–50,000	22.00	2.00	20.00	
	(16.92%)	(8.33%)	(18.87%)	
\$51–100,000	10.00	2.00	8.00 (7.55%)	
	(7.69%)	(8.33%)		
>\$100,000	20.00	6.00	14.00	
	(15.39%)	(25.00%)	(13.21%)	
Race/ethnicity				0.5
Asian/Pacific Islander	54.00	11.00	43.00	
	(41.54%)	(45.84%)	(40.57%)	
Hispanic/Latino/ Spanish Origin	23.00	2.00	21.00	
	(17.69%)	(8.33%)	(19.81%)	
White	21.00	3.00	18.00	
	(16.15%)	(12.50%)	(16.98%)	
Black or African American	20.00	6.00	14.00	
	(15.38%)	(25.00%)	(13.21%)	
American Indian/ Alaska Native	8.00	2.00	6.00 (5.66%)	
	(6.16%)	(8.33%)		
Other	4.00	0.00	4.00 (3.77%)	
	(3.08%)	(0.00%)		
Cancer Type				0.6
Cervix	46.00	9.00	37.00	
	(35.38%)	(37.50%)	(34.91%)	
Uterine	33.00	4.00	29.00	
	(25.38%)	(16.67%)	(27.36%)	
Ovarian	29.00	5.00	24.00	
	(22.30%)	(20.83%)	(22.64%)	
Vulvar/Vaginal	22.00	6.00	16.00	
	(16.92%)	(25.00%)	(15.09%)	
Education Level				0.7
Elementary	17.00	2.00	15.00	
	(13.08%)	(8.33%)	(14.15%)	
High School	51.00	9.00	42.00	
	(39.23%)	(37.50%)	(39.62%)	
College or greater	62.00	13.00	49.00	
	(47.69%)	(54.17%)	(46.23%)	

¹ n (%)² Pearson's Chi-squared test; Fisher's exact test

complementary and alternative medicine in each study. Notably, however, these previous studies involved majority White patient populations, with White patients comprising 93.5% of all study participants in Abdullah et al. and 84% in Swisher et al. (Abdallah et al., 2015; Swisher et al., 2002) In contrast, White patients comprised just 16% of participants in our study, while Asian or Pacific Islander patients comprised 42% of participants. A previous study of CAM use found that while Asian American participants were just as likely as White participants to use CAM, they were less likely to disclose use of CAM modalities to health care providers. (Mehta et al., 2007) The lower rates of CAM use in our study may be influenced by a larger proportion of Asian or Pacific Islander respondents. It is possible that these rates may reflect a hesitancy among this population to disclose CAM use, as well as cultural differences in what modalities are considered “complementary” or

“alternative.” Although our study did not find a significant difference in CAM use when stratified by race, the overall low rate of CAM use may reflect rates representative of a more diverse gynecologic cancer patient population.

Previous studies of CAM use among oncology patients have shown an association between higher education level and CAM use as well as between older age and CAM use (Ludwick et al., 2020; Bishop and Lewith, 2010). These findings were consistent when assessed in a study of patients with gynecologic cancer specifically (Abdallah et al., 2015). In our study, there was no significant difference in reported CAM use based on patient age, income, education level, ethnicity, cancer type, reported family support, or current treatment type. While these non-significant findings may reflect small sample sizes, they also suggest that previously held assumptions regarding CAM use associations may require further investigation in the context of diverse patient populations.

To our knowledge, only one previous study has used the ABCAM validated survey to describe the relationship between patient demographics and attitude and beliefs toward CAM (Bauml et al., 2015). In that study, non-White respondents reported more perceived barriers to CAM use, and age and income level were both found to be significantly associated with expected benefit from CAM use (Bauml et al., 2015). Notably, however, that study was conducted among patients with breast, gastrointestinal and lung cancers and included a majority (78%) White patient population. In another study among breast cancer patients using a modified version of the ABCAM instrument, non-White respondents reported higher perceived barriers to acupuncture use (Bao et al., 2018).

Here, we demonstrated that Black and Asian respondents were more likely to report greater expected benefit from CAM use with no significant difference in expected benefit among respondents of different ages or income levels. In addition, we demonstrated that White and Asian respondents reported greater perceived barriers to CAM use. While our own study findings did not align with those of the few previous studies utilizing the ABCAM tool, each of these studies represented a different cancer population. Our findings suggest that the ABCAM tool can be used to explore and better understand how different patient populations and demographic groups interact with CAM as a part of their gynecologic oncology care. Understanding patient preferences for using CAM may also allow us to tailor CAM-related interventions, such as acupuncture, based on specific patient population demographics to provide more patient-centered care. Understanding that certain demographic groups report more perceived barriers to CAM may prompt us to be more intentional about inquiring about patient interactions with CAM. Discussion of CAM in gynecologic oncology care is an opportunity to address misconceptions and to provide support for and information on available, safe, and evidence-based resources. Our study is the first to evaluate attitudes and beliefs regarding CAM use in a gynecologic cancer population and represents a new opportunity to better address the CAM-related need of these patients.

Our study had several limitations. First, our sample was limited to patients being treated for gynecologic malignancies. While the diverse nature of the sample provides invaluable information within the gynecologic oncology realm, our findings may have limited generalizability to other oncology fields. Second, the cross-sectional nature of our studies precludes causal hypothesis from our data. In addition, while there is growing support for use of CAM modalities in conjunction with traditional medicine, such as the National Comprehensive Cancer Network establishing formal clinical practice guidelines for use of many CAM modalities in supportive cancer care, use of CAM as an alternative rather than a complement to traditional cancer therapies is far more contentious (Mao et al., 2022). Our study did not distinguish patients utilizing CAM in conjunction with traditional medicine versus in alternative, a distinction that may have offered valuable insights into patient attitudes and beliefs toward CAM. In addition, our study found no significant difference in CAM use among patients receiving chemotherapy or

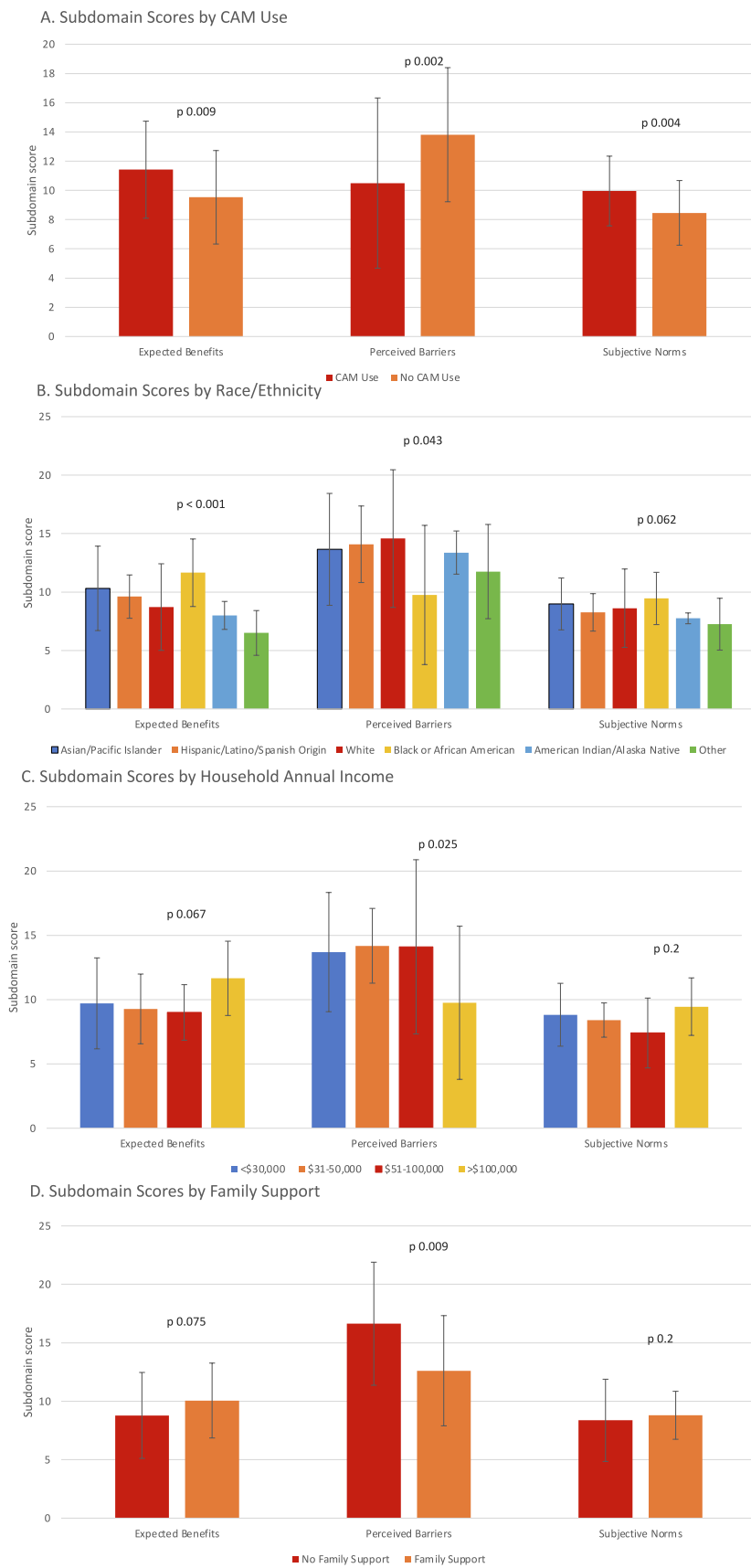


Fig. 1. ABCAM Survey instrument subdomain scores stratified by patient demographics. For each subdomain of expected benefits, perceived barriers, and subjective norms, a score was calculated, normalized and analyzed separately with no summative score used. A higher score in each subdomain correlates to greater expected benefits, greater perceived barriers, and more positive subjective norms surrounding CAM use. A shows subdomain scores by CAM use, 1B by race/ethnicity, 1C by household annual income, and 1D by presence or absence of family support.

radiation at the time of survey completion compared to those who were not receiving chemotherapy or radiation. However, we acknowledge that other patient factors such as response to treatment or treatment side effect severity at time of survey completion may affect a patient's attitudes and beliefs toward CAM.

CAM therapies and practices represent a significant and growing aspect of oncology care (Chase et al., 2014). Our study suggests that CAM use in gynecologic oncology patients may be lower than previously suspected and that there is some association between demographic factors and attitudes and beliefs regarding CAM. Previous studies have suggested that interest in CAM is high among minority patients and those with gynecologic cancer (Ben-Arye et al., 2012; Bari et al., 2021; Grimm et al., 2021). Findings from this study suggest that demographic factors such as income, race and ethnicity inform attitudes and beliefs about CAM should also be considered. This information can be used to better tailor the provision of evidence-based CAM interventions to benefit a greater number of gynecologic cancer patients.

Author Contributions.

Emily A Miller: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. Shanice Beaumont: Conceptualization, Investigation, Visualization, Writing—original draft. Zhen Ni Zhou: Conceptualization, Investigation, Methodology, Resources, Data curation, Writing—original draft. Eloise Chapman-Davis: Investigation, Methodology, Writing – review & editing. Evelyn Cantillo: Investigation, Methodology, Writing – review & editing. Kevin Holcomb: Investigation, Methodology, Writing – review & editing. Tara Pua: Conceptualization, Investigation, Methodology, Writing – review & editing. Melissa K Frey: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

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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Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.gore.2023.101232>.

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