Complementary and Alternative Therapy Use Before and After Breast Cancer Diagnosis: The Pathways Study

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Abstract

Background—Many women use complementary and alternative medicine (CAM) to maintain or improve their health. We describe CAM use among the first 1,000 participants enrolled in the Pathways Study, an ongoing prospective cohort study of women diagnosed with breast cancer (BC).

Methods—Participants, identified by rapid case ascertainment in Kaiser Permanente Northern California, are women ≥21 years diagnosed with first invasive BC. Comprehensive baseline data are collected on CAM use through in-person interviews.

Results—Study participants include 70.9% non-Hispanic whites, 10.2% Hispanics, 9.0% Asians, 6.5% African-Americans, and 3.4% others. Most women (82.2%) were diagnosed with AJCC stage I/II BC, at average (±SD) age 59.5 (±12.0) years and reported prior use of at least one form of CAM (96.5% of participants). In the five years before diagnosis, CAM therapies used at least weekly by >20% of women included green tea, glucosamine, omega-3 fatty acids, prayer and religion. CAM use was high (86.1% of participants) in the period immediately following diagnosis; 47.5% used botanical supplements, 47.2% used other natural products, 28.8% used special diets, 64.2% used mind-body healing, and 26.5% used body/energy/other treatments. In multivariable analyses, frequent use of each CAM modality before and after diagnosis was associated with use of other CAM modalities and other health behaviors (i.e., high fruit/vegetable intake, lower BMI).

Conclusions—CAM use before and after BC diagnosis is common in this diverse group of women. Our results emphasize the need for clinicians to discuss CAM use with all BC patients.

Keywords

complementary and alternative medicine; breast cancer; cohort study; epidemiology

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Introduction

In 2008, an estimated 182,460 women will be diagnosed with breast cancer in the US [1]. There are currently over two million breast cancer survivors, and the number continues to grow as women are being diagnosed at earlier stages of disease and conventional breast cancer treatments are prolonging survival. Many women want to know, in addition to conventional therapies, what proactive steps they can take to positively impact their prognosis after diagnosis, including adaptation of lifestyle changes and use of complementary and alternative medicine (CAM).

Lifestyle changes encompass nutrition and physical activity, and CAM includes pharmacologic and non-pharmacologic therapies. Pharmacologic CAM therapies include botanical supplements, other natural products, and special diets, while non-pharmacologic therapies include mind-body approaches, body-based therapies, energy-based therapies, and other systems of healing [2]. CAM use by women with breast cancer has been increasing over time [3], yet little is known about how lifestyle factors and CAM use after diagnosis impact prognosis.

We examined data on CAM use before and immediately after diagnosis in the Pathways Study, a prospective cohort study of women diagnosed with invasive breast cancer within Kaiser Permanente Northern California (KPNC) [4]. This information can improve our understanding of CAM use patterns and motivations, as well as identify CAM practices that may affect cancer-related prognosis, quality of life, and adherence to breast cancer treatment. This paper describes CAM use before and after breast cancer diagnosis among the first 1,000 Pathways Study participants.

Methods

Study Cohort

The Pathways Study is an ongoing prospective cohort study of women who are newly-diagnosed with invasive breast cancer and who are members of KPNC. Women are recruited as soon after diagnosis as possible (usually within two months), as described elsewhere [4]. Briefly, cases are ascertained on a daily basis by automatic scanning of electronic pathology reports with subsequent verification of cancer diagnosis and patient notification. Eligibility criteria include: current KPNC membership; at least 21 years of age at diagnosis; recent diagnosis of first primary invasive breast cancer; no prior history of cancer other than non-melanoma skin cancer; ability to speak English, Spanish, Cantonese, or Mandarin; and residence within a 65-mile radius of a field interviewer. Written informed consent is obtained from all participants at the time of the in-person baseline interview. This study is approved by the institutional review boards of all collaborating institutions involved with data collection and analysis.

As of January 6, 2009, 2,357 breast cancer patients have been enrolled. The mean time from diagnosis to enrollment is 1.8 months (range: 0.3- 7.2 months). The overall recruitment rate among eligible subjects is 51%. The present analysis includes information from the first 1,000 women enrolled in the cohort.

CAM Use and Other Covariates

Overview of baseline data collection—During the baseline interview, interviewers administer detailed questionnaires on demographics, diet, exercise, CAM use, psychosocial, and quality-of-life measures. Anthropometry measures are taken, and blood and saliva samples are obtained.

CAM assessment—CAM use is assessed with a two-part self-administered questionnaire based on those used in previous studies [5-8]. Part 1 is a checklist asking about ever use of five general CAM modalities and specific CAM therapies within each modality, including botanical supplements such as black cohosh, ginseng, and mistletoe (90 items); other natural products such as co-enzyme Q10, DHEA, and melatonin (26 items); special diets such as low-fat, macrobiotic, and vegan (12 items); mind-body healing approaches such as hypnosis, support groups, and yoga (17 items); and body-based, energy-based, and other treatments such as acupuncture, naturopathy, or Reiki (23 items). Space is available for women to report use of other CAM therapies that are not specified on the questionnaire. Part 2 solicits information on total length of use, use in the five years prior to diagnosis, and use since diagnosis. Data on frequency of use collected for the five years before diagnosis are categorized as never use, occasional use (up to four times per month), and frequent use (greater than four times per month). On the baseline questionnaire, assessment of CAM use since diagnosis is recorded as yes/no.

Other Covariates—Fruit and vegetable intake is assessed by food frequency questionnaire (FFQ) (NutritionQuest, Berkeley, CA) [9,10], which provides a summary measure for the average number of servings of fruits and vegetables consumed per week.

KPNC electronic medical records are abstracted to collect data on body mass index (BMI) at diagnosis and breast surgery. The KPNC Cancer Registry (KPNCCR) [11] is accessed to obtain diagnostic tumor characteristics such as hormone receptor status, HER2/neu expression, tumor size, number of positive nodes, American Joint Committee on Cancer (AJCC) stage, and initial course of treatment, including chemotherapy, radiation therapy, and hormonal therapy.

Statistical Analysis

Multivariable analyses were performed using logistic regression to identify independent predictors of ever use of separate CAM modalities and post-diagnosis use in the period between diagnosis and study enrollment. Variables that were selected *a priori* to include in the models were age, race/ethnicity, education, and income. Additional variables were included in the models based on univariate analyses between each demographic, lifestyle, and clinical variable with CAM use. Analyses were conducted using Statistical Analysis Software (SAS) version 9.1.

Results

Participant characteristics

Women enrolled in the Pathways Study are ethnically diverse. The first 1,000 participants included 70.9% non-Hispanic whites, 10.2% Hispanics, 9.0% Asians, 6.5% African-Americans, and 3.4% others (Table 1). The average age (mean ± SD) at breast cancer diagnosis was 59.5 ± 12.0 years. Women were enrolled in this study an average (mean ± SD) of 56.3 ± 22.2 days after breast cancer diagnosis.

Overview of CAM use

Most (96.5%) women reported a history of using at least one form of CAM, and 57.3% reported ever using four or more of the general CAM modalities. Each of the five general CAM modalities (botanicals, other natural products, special diets, mind-body healing, body/energy/other treatments) was used by 63-75% of participants at least once in their lives.

In general, women age 50-69 years at breast cancer diagnosis were more likely to use CAM (specifically botanical supplements, other natural products, special diets, and body/energy/

other treatments) in the previous five years than younger or older women (Table 1). Postmenopausal women were more likely to report recent use of other natural products than premenopausal women (Table 1). Higher education and higher income were both associated with using all CAM modalities in the previous five years, except that income was not associated with the use of mind-body healing (Table 1). When comparing women who did and did not use each of the CAM modalities in the five years prior to diagnosis, there were no differences in use based on family history of breast cancer, stage at diagnosis, tumor characteristics, or course of breast cancer treatment (Table 1). Women who on average ate more than the recommended five servings of fruits and vegetables per day prior to diagnosis were more likely to report using botanical supplements compared to women who ate less than five servings per day (Table 1).

Non-Hispanic whites and African-Americans were more likely to report using other natural products in the past five years than Hispanics and Asians (Table 1). Non-Hispanic white women were more likely to report using special diets in the past five years than women in the other racial/ethnic groups (Table 1). Overall, use did not differ substantially across racial/ethnic groups for use of botanical, mind-body, or body/energy/other therapies.

Of the 168 individual CAM therapies/approaches listed on the questionnaire, only 37 were ever used by more than 10% of the population, and only 30 were used by more than 10% of the population in the five years prior to diagnosis (data not shown). For simplicity of presentation, Table 2 shows the individual CAM therapies ever used by more than 20% (rather than 10%) of participants within any of the four ethnic groups, and shows use during the past five years and use in the period between diagnosis and study enrollment. In the five years prior to diagnosis, pharmacologic therapies (i.e., botanical supplements, other natural products, and special diets) used at least weekly by more than 20% of women included green tea, glucosamine, and omega-3 fatty acid supplements, while the non-pharmacologic approaches (i.e., mind-body healing and body/energy/other treatments) used at least weekly by more than 20% of women were prayer and religion. In the period between diagnosis and study enrollment, 86.1% of participants reported using any form of CAM; 47.5% of participants reported using herbal and botanical supplements, 47.2% reported use of natural products, 28.8% reported using special diets, 64.2% reported using mind-body healing, and 26.5% reported using body/energy/other treatments.

We found that a history of CAM use was common among the 97 participants who reported annual household income <$25,000 and had a high school-level education or less; 56% reported ever using botanicals, 61% reported ever using other natural products, 51% reported ever using special diets, 72% reported ever using mind-body healing, and 54% reported using body/energy/other treatments (data not shown).

Demographic, clinical and lifestyle characteristics associated with CAM use before and after breast cancer diagnosis

Botanicals—The most commonly used botanical therapies included green tea (40.9%), Echinacea (32.2%), flax seed (23.5%), cranberry (23.5%) and chamomile (22.5%). Frequent use of botanicals during the five years prior to diagnosis was associated with high fruit and vegetable intake and using other forms of CAM (Table 3), whereas frequent use in the months following diagnosis was associated with being younger, having a BMI <25 kg/m^2, and using other forms of CAM (Table 4).

Other natural products—The most commonly used other natural products included glucosamine (36.9%), omega-3 fatty acid supplements (33.7%), laxatives (27.1%), chondroitin (22.7%), and fiber supplements (19.7%). Frequent use of other natural products in the five years prior to diagnosis was associated with being older and using other forms of

CAM (Table 3). However, frequent use of other natural products after diagnosis was associated with being older, more educated, and using other forms of CAM; Asians, obese women, and women with "triple-negative" tumors were less likely to frequently use other natural products after diagnosis (Table 4).

Special diets—Commonly used special diets included low-fat (25.7%), weight loss (22.5%), low-carbohydrate (18.9%), Atkins (18.4%), and high-protein (13.0%); the latter three may be seen as variations of one another. Frequent use of special diets in the five years before breast cancer diagnosis was associated with higher education, being overweight, eating >35 servings of fruits and vegetables per week, and use of other forms of CAM; Hispanics were less likely to have frequently used special diets (Table 3). Frequent use of special diets after breast cancer diagnosis was associated with higher education, higher intake of fruits and vegetables, and use of other forms of CAM (Table 4).

Mind-body healing—Popular mind-body healing approaches included prayer (45.4%), meditation (24.2%), religion (24.0%), deep breathing exercises (23.4%), and yoga (22.2%). Frequent use of mind-body healing approaches in the five years before breast cancer diagnosis was associated with higher education, lower income, and use of other forms of CAM (Table 3). Frequent use of mind-body healing approaches after breast cancer diagnosis was associated with being Hispanic, higher education, lower income, and use of other forms of CAM (Table 4).

Body/energy/other therapies—Frequently used body/energy/other therapies included massage (44.6%), chiropractic care (34.1%), acupuncture (24.5%), acupressure (13.6%), and aromatherapy (10.9%). Frequent use of these treatments before and after diagnosis was associated with being younger, lower income, and use of other forms of CAM (Tables 3 and 4). In addition, frequent use of these treatments after diagnosis was also associated with having a hormone receptor-positive and HER2/neu-negative tumor (Table 4).

CAM use during treatment

At study enrollment, most women had received or were receiving treatment for their breast cancer, including lumpectomy (67.6%) or mastectomy (27.9%), chemotherapy (15.2%), radiation therapy (6.9%), or hormonal therapy (11.1%). Of the women who received chemotherapy, 63.8% reported using a pharmacological form of CAM (botanicals or other natural products) between diagnosis and study enrollment. In general, the proportion of users for each type of CAM modality in the five years prior to diagnosis was only slightly greater than the proportion who reported using in the post-diagnosis period between diagnosis and study enrollment (Table 2).

Discussion

The Pathways Study is a prospective cohort study of women diagnosed with primary invasive breast cancer, and a major aim is to examine how lifestyle factors and CAM use affect prognosis. Here, we report on CAM use among the first 1,000 women enrolled in the cohort. We found that frequent use of pharmacologic (botanical supplements, other natural products, and special diets) and non-pharmacologic (mind-body approaches and body/energy/other therapies) forms of CAM before and after diagnosis was very common among study participants, although use of different types of modalities differed by demographic, clinical, and other characteristics. Prevalence of CAM use was high regardless of socioeconomic status. In general, use of any of the CAM modalities was strongly associated with the use of other forms of CAM, which suggests that women were not using the

different CAM modalities in isolation. CAM use did not decrease substantially from the five years prior to diagnosis to the time between diagnosis and study enrollment.

Our results are similar to other studies that have described CAM use by women in the general US population and by women after breast cancer diagnosis. Among respondents to a 2002 National Health Interview Survey in the United States, 69% of women reported using at least one form of CAM, and 24% of women reported using biologically-based therapies [12]. A recently published paper from the American Cancer Society's Study of Cancer Survivors-I showed that among cancer survivors, those with breast cancer are the most likely to use CAM in the 10-24 months following cancer diagnosis [13]; 55.9% used biologically-based practices, 85.7% used mind-body methods, 20.2% used manipulative and body-based practices, 13.5% used energy medicine, and 4.4% used alternative medical systems. The Nurses' Health Study reported that 62% of breast cancer survivors used at least one form of CAM during the two years prior to assessment, a mean of 3.2 years post-diagnosis [14], and the Women's Healthy Eating and Living (WHEL) Study reported that 80.9% of study participants used dietary supplements at study enrollment, which was within four years of diagnosis [15]. A recent review paper [3] suggested that CAM use by breast cancer patients after diagnosis has increased over the past 20 years, yet few studies have examined CAM use immediately after diagnosis and into the post-treatment period.

Recent studies suggest that use of different CAM modalities varies by demographic, clinical, and behavioral characteristics [14]. In general, we found that CAM use was associated with various factors (e.g., having a higher level of formal education and household income, eating more fruits and vegetables, having a lower BMI, and using other forms of CAM). In addition, use prior to diagnosis was associated with use in the few months after diagnosis. However, while we identified several characteristics that describe a profile of frequent CAM users, CAM use was still high in women without these characteristics. This emphasizes the need for clinicians to discuss CAM use with all breast cancer patients.

To our knowledge, the Pathways Study is the first prospective cohort study to comprehensively collect CAM use information from women around the time of breast cancer diagnosis, including use in the immediate post-diagnosis period. Follow-up questionnaires are being administered to collect information on how CAM use may change as a woman moves through treatment and enters into follow-up care. Future analyses will examine how CAM use affects treatment-related side effects, recurrence, and survival. We also plan to investigate the effects of using some controversial dietary supplements, including antioxidants [16] and soy isoflavones [17], after a breast cancer diagnosis and during treatment. This study is also one of the first designed to examine factors associated with frequent CAM use, as frequent use may have the most impact on biological, clinical, and quality-of-life endpoints.

In summary, our current analyses show that use of pharmacological and non-pharmacological forms of CAM before and after diagnosis is highly prevalent among women with breast cancer in this ethnically-diverse cohort. These data suggest that clinicians should discuss CAM use with all patients, regardless of ethnic background or socioeconomic status. Future analyses from this cohort study will be able to describe patterns of CAM use in the years after breast cancer diagnosis, and how CAM use may impact breast cancer recurrence and survival.

Acknowledgments

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Table 1

Demographic, clinical, and lifestyle characteristics of Pathways Study Participants, by CAM use in the five years prior to breast cancer diagnosis, 2006–2007 (n=1,000).

	Total	Botanical Supplements		Other Natural Products		Special Diets		Mind-Body Healing		Body/Energy/Other Treatments	
		Users	Non-Users	Users	Non-Users	Users	Non-Users	Users	Non-Users	Users	Non-Users
	n=1,000 %	n=627 %	n=367 %	n=641 %	n=356 %	n=484 %	n=515 %	n=678 %	n=321 %	n=527 %	n=473 %
Demographic Characteristics											
Age at Diagnosis											
<50 years	20.6	22.8	16.9 §	18.4	24.4 *	19.2	21.9 †	21.1	19.6	22.8	18.2 §
50-59 years	30.6	31.9	27.8	29.5	32.6	33.1	28.2	31.9	27.7	33.4	27.5
60-69 years	29.0	30.0	27.8	32.1	23.6	31.6	26.6	28.5	30.2	30.0	27.9
70+ years	19.8	15.3	27.5	20.0	19.4	16.1	23.3	18.6	22.4	13.9	26.4
Race/Ethnicity											
Non-Hispanic White	70.9	70.8	71.7	75.4	63.2 ‡	76.0	66.0 †	70.1	72.6	73.4	68.1
Hispanic	10.2	10.2	10.4	8.0	14.3	8.9	11.5	11.1	8.4	8.7	11.8
Asian	9.0	9.1	8.2	7.0	12.1	6.4	11.5	9.0	9.0	8.3	9.7
African-American	6.5	6.4	6.8	6.4	6.7	6.2	6.8	6.5	6.5	5.7	7.4
Other	3.4	3.5	3.0	3.3	3.7	2.5	4.3	3.4	3.4	3.8	3.0
Educational Attainment											
High school or less	16.0	12.9	21.0 ‡	12.6	22.2 ‡	12.8	19.0 †	12.8	22.7 ‡	11.0	21.6 §
Some college	37.1	36.5	38.7	38.1	35.4	37.6	36.7	37.5	36.4	36.1	38.3
College graduate	25.9	26.5	24.8	25.7	25.8	24.8	27.0	27.1	23.4	27.5	24.1
Post graduate	21.0	24.1	15.5	23.6	16.6	24.8	17.3	22.6	17.4	25.4	16.1
Household Income											
< $25,000	9.7	7.2	14.2 †	7.6	13.5 †	5.6	13.6 §	9.7	9.7	7.4	12.3 †
$25,000-49,999	19.2	19.0	18.8	19.0	19.1	19.6	18.8	20.1	17.4	17.8	20.7
$50,000-89,999	29.7	31.4	27.0	32.0	25.6	34.3	25.4	31.0	27.1	32.6	26.4
$90,000+	27.8	29.2	25.6	29.2	25.6	31.0	24.7	26.8	29.6	30.2	25.2
Not reported	13.6	13.2	14.4	12.2	16.3	9.5	17.5	12.4	16.2	12.0	15.4
Clinical Characteristics											

	Total	Botanical Supplements		Other Natural Products		Special Diets		Mind-Body Healing		Body/Energy/Other Treatments	
		Users	Non-Users	Users	Non-Users	Users	Non-Users	Users	Non-Users	Users	Non-Users
	n=1,000 %	n=627 %	n=367 %	n=641 %	n=356 %	n=484 %	n=515 %	n=678 %	n=321 %	n=527 %	n=473 %
Menopausal Status at Diagnosis											
Premenopausal	29.1	30.6	26.7	25.3	36.0‡	27.5	30.7	29.9	27.4	31.7	26.2
Postmenopausal	70.9	69.4	73.3	74.7	64.0	72.5	69.3	70.1	72.6	68.3	73.8
Family History of Breast Cancer	22.2	21.7	23.2	22.5	21.9	24.2	20.4	22.3	22.1	21.4	23.0
Tumor Characteristics											
Stage At Diagnosis											
I	49.9	51.8	45.8	51.2	47.5	51.4	48.5	49.7	50.5	50.3	49.5
II	30.9	30.9	31.3	30.3	32.3	28.7	32.8	32.3	27.7	30.6	31.3
III	10.6	9.4	12.8	10.6	10.7	12.2	9.1	9.9	12.1	10.4	10.8
IV	1.7	1.8	1.6	2.0	1.1	1.4	1.9	1.8	1.6	2.1	1.3
Hormone-Receptor Status											
ER+/PR+	68.2	68.4	67.8	67.2	70.2	67.8	68.5	67.3	70.1	68.5	67.9
ER+/PR-	13.5	13.9	12.8	14.4	12.1	14.5	12.6	14.6	11.2	13.3	13.7
ER-/PR+	0.3	0.3	0.3	0.2	0.6	0.4	0.2	0.3	0.3	0.4	0.2
ER-/PR-	15.6	15.3	16.1	15.8	14.9	14.5	16.7	15.8	15.3	15.2	16.1
HER2/neu Status											
Negative	70.9	71.5	69.8	70.2	72.2	71.9	70.1	69.9	73.2	70.2	71.7
Borderline	12.4	12.6	12.0	12.6	12.1	12.2	12.4	13.4	10.0	12.3	12.5
Positive	9.7	9.6	10.1	9.7	9.6	8.9	10.5	9.3	10.6	10.2	9.1
Triple Negative **	9.8	9.6	10.1	9.5	10.1	9.9	9.7	9.7	10.0	9.9	9.7
Treatment Received During the 4-6 Months Post-Diagnosis											
Definitive Breast Surgery											
Lumpectomy	60.0	60.8	58.3	60.1	60.1	62.0	58.1	59.7	60.4	61.9	57.9
Mastectomy	37.2	36.4	39.0	37.0	37.4	36.4	38.1	37.2	37.4	34.7	40.0
None	2.8	2.9	2.7	3.0	2.5	1.7	3.9	3.1	2.2	3.4	2.1
Chemotherapy	44.0	46.4	40.3	42.0	47.5	44.8	43.1	44.8	42.1	45.9	41.9
Radiation Therapy	34.3	33.7	35.4	35.7	32.0	33.7	34.8	33.2	36.4	34.7	33.8
Hormonal Therapy	40.3	40.2	40.1	41.3	38.8	41.9	38.8	38.6	43.9	39.5	41.2

	Total	Botanical Supplements		Other Natural Products		Special Diets		Mind-Body Healing		Body/Energy/Other Treatments	
		Users	Non-Users	Users	Non-Users	Users	Non-Users	Users	Non-Users	Users	Non-Users
	n=1,000 %	n=627 %	n=367 %	n=641 %	n=356 %	n=484 %	n=515 %	n=678 %	n=321 %	n=527 %	n=473 %
Lifestyle Characteristics											
Body Mass Index at Diagnosis											
<25 kg/m^2	34.7	35.9	33.0	35.1	34.0	27.5	41.4 §	34.5	34.9	35.7	33.6
25-30 kg/m^2	31.7	32.7	29.7	32.9	29.2	35.3	28.3	33.3	28.3	32.3	31.1
>30 kg/m^2	33.5	31.4	37.1	32.0	36.5	37.2	30.1	32.2	36.4	32.1	35.1
Fruit and Vegetable Intake Prior to Diagnosis											
<35 servings/week	50.2	47.2	55.6 *	49.1	52.5	46.5	53.6	49.7	51.1	46.5	54.3
≥35 servings/week	38.9	41.9	33.5	40.9	34.8	44.2	34.0	40.3	36.1	41.9	35.5

Percentages in columns do not equal 100% because of missing data.

Pearson chi-squared tests are used to calculate p-values for non-missing data.

*
P-value <0.05.

†
P-value <0.01.

‡
P-value <0.001.

§
P-value <0.0001.

**
Triple negative = estrogen receptor-negative, progesterone receptor-negative, and HER2/neu-negative tumor.

Table 2

Use of CAM therapies ever used by ≥20% of participants within one of the four ethnic groups (non-Hispanic white, Hispanic, Asian, African-American), Pathways Study, 2006-2007.

| | Non-Hispanic White (n=709) | | | | | Hispanic (n=102) | | | | | Asian (n=90) | | | | | African-American (n=65) | | | | | P-Value* | |
| | Ever (%) | Past 5 years | | | Since diagnosis (%) | Ever (%) | Past 5 years | | | Since diagnosis (%) | Ever (%) | Past 5 years | | | Since diagnosis (%) | Ever (%) | Past 5 years | | | Since diagnosis (%) | Ever | Since diagnosis |
		Never (%)	Occ (%)	Freq (%)			Never (%)	Occ (%)	Freq (%)			Never (%)	Occ (%)	Freq (%)			Never (%)	Occ (%)	Freq (%)			
Botanical Supplements	71.9	36.4	12.4	50.2	46.8	69.6	36.3	20.6	42.2	42.2	72.2	36.7	11.1	52.2	55.6	67.7	38.5	7.7	53.8	46.2	0.87	0.30
Green Tea	39.8	64.9	10.0	23.7	25.7	38.2	63.7	13.7	21.6	20.6	47.8	57.8	8.9	33.3	30.0	47.7	56.9	12.3	30.8	30.8	0.30	0.55
Echinacea	35.4	73.6	19.0	6.5	3.0	26.5	77.5	14.7	6.9	3.9	20.0	86.7	6.7	6.7	1.1	21.5	81.5	10.8	7.7	3.1	0.002	0.60
Flax Seed	25.5	79.4	5.1	14.8	12.3	15.7	85.3	4.9	8.8	9.8	17.8	87.8	1.1	11.1	10.0	23.1	84.6	3.1	12.3	10.8	0.08	0.59
Cranberry	25.2	79.4	10.4	9.2	9.7	14.7	87.3	7.8	4.9	5.9	18.9	87.8	5.6	6.7	10.0	26.2	75.4	6.2	18.5	12.3	0.08	0.73
Chamomile	22.7	81.4	11.3	6.2	8.6	28.4	75.5	10.8	11.8	10.8	13.3	94.4	3.3	2.2	3.3	16.9	86.2	7.7	6.2	7.7	0.06	0.74
Garlic	18.8	85.8	2.0	11.3	6.8	14.7	85.3	3.9	10.8	6.9	17.8	85.6	3.3	11.1	10.0	29.2	75.4	4.6	20.0	9.2	0.12	0.42
Ginseng	16.6	88.9	5.2	5.2	1.7	16.7	85.3	6.9	7.8	0.0	11.1	93.3	3.3	2.2	0.0	23.1	80.0	7.7	9.2	1.5	0.27	0.40
Ginger	14.8	87.0	6.9	5.1	6.5	16.7	84.3	11.8	2.9	5.9	15.6	87.8	5.6	6.7	7.8	24.6	81.5	9.2	7.7	7.7	0.22	0.69
Other Natural Products	77.2	30.7	10.3	57.8	51.3	64.7	50.0	8.8	41.2	37.3	61.1	50.0	7.8	42.2	34.4	78.5	35.4	20.0	43.1	36.9	0.001	0.001
Glucosamine	40.2	64.0	3.7	31.9	17.6	25.5	79.4	1.0	18.6	10.8	34.4	70.0	4.4	25.6	11.1	26.2	76.9	0.0	23.1	7.7	0.006	0.40
Fish oils, Omega-3 fatty acids	36.7	70.1	2.1	26.4	16.9	22.5	82.4	1.0	15.7	10.8	26.7	80.0	2.2	17.8	14.4	29.2	76.9	6.2	16.9	9.2	0.01	0.49
Laxatives	27.6	77.2	18.2	4.1	12.8	29.4	78.4	17.6	3.9	11.8	15.6	88.9	11.1	0.0	6.7	36.9	69.2	26.2	4.6	12.3	0.02	0.59
Chondroitin	25.7	77.6	1.8	20.0	11.6	12.7	89.2	1.0	9.8	7.8	18.9	83.3	1.1	15.6	6.7	15.4	84.6	0.0	15.4	4.6	0.01	0.38
Fiber Supplement	22.4	83.4	6.5	9.9	9.2	11.8	89.2	3.9	5.9	2.9	8.9	94.4	2.2	3.3	3.3	20.0	81.5	13.8	4.6	7.7	<.01	0.73
Acidophilus	20.6	85.3	5.6	7.8	6.6	8.8	94.1	2.9	2.9	2.9	10.0	95.6	1.1	3.3	4.4	10.8	89.2	7.7	3.1	3.1	<.01	0.92
Special Diets	70.4	47.0	16.1	35.4	31.0	58.8	56.9	19.6	21.6	18.6	43.3	65.6	8.9	24.4	30.0	60.0	53.8	16.9	29.2	27.7	<.0001	0.08
Low-Fat Diet	27.5	80.4	5.9	13.7	13.7	26.5	82.4	6.9	10.8	12.7	16.7	87.8	1.1	11.1	11.1	21.5	81.5	4.6	13.8	10.8	0.13	0.69
Weight Loss	24.8	87.0	6.1	6.9	4.2	21.6	89.2	8.8	2.0	0.0	11.1	93.3	5.6	1.1	3.3	15.4	87.7	10.8	1.5	1.5	0.01	0.10
Atkins Diet	20.6	89.4	7.6	3.0	0.6	12.7	93.1	4.9	2.0	0.0	7.8	94.4	1.1	4.4	0.0	18.5	90.8	9.2	0.0	0.0	0.01	0.83
Low-Carbohydrate Diet	19.9	83.8	5.9	10.3	7.3	13.7	88.2	8.8	2.9	3.9	17.8	85.6	6.7	7.8	10.0	20.0	86.2	6.2	7.7	7.7	0.51	0.46
Mind-Body Healing	73.8	32.3	5.9	60.8	62.9	77.5	26.5	6.9	66.7	71.6	72.2	32.2	4.4	63.3	66.7	72.3	32.3	0.0	67.7	66.2	0.83	0.35
Prayer	41.7	59.9	2.7	37.4	39.6	58.8	45.1	2.0	52.9	57.8	46.7	55.6	4.4	40.0	46.7	64.6	36.9	0.0	63.1	61.5	<.0001	0.36
Meditation	25.5	80.0	4.8	15.2	19.0	19.6	83.3	5.9	10.8	14.7	17.8	88.9	1.1	10.0	11.1	18.5	86.2	3.1	10.8	12.3	0.173	0.53

	Non-Hispanic White (n=709)					Hispanic (n=102)					Asian (n=90)					African-American (n=65)					P-Value*	
	Ever (%)	Past 5 years			Since diagnosis (%)	Ever (%)	Past 5 years			Since diagnosis (%)	Ever (%)	Past 5 years			Since diagnosis (%)	Ever (%)	Past 5 years			Since diagnosis (%)	Ever	Since diagnosis
		Never (%)	Occ (%)	Freq (%)			Never (%)	Occ (%)	Freq (%)			Never (%)	Occ (%)	Freq (%)			Never (%)	Occ (%)	Freq (%)			
Deep Breathing Exercises	25.0	78.1	7.2	14.7	21.0	21.6	81.4	5.9	12.7	18.6	17.8	85.6	4.4	10.0	13.3	13.8	87.7	4.6	7.7	7.7	0.11	0.06
Yoga	25.0	82.4	4.9	12.7	8.3	17.6	87.3	4.9	7.8	0.0	16.7	87.8	4.4	7.8	8.9	10.8	92.3	1.5	6.2	3.1	0.01	0.01
Psychotherapy	25.0	85.2	9.4	5.4	7.3	16.7	88.2	6.9	4.9	5.9	10.0	92.2	2.2	5.6	6.7	9.2	95.4	1.5	3.1	3.1	<.0001	0.14
Religion	22.8	78.8	1.6	19.6	20.9	29.4	71.6	1.0	27.5	27.5	26.7	75.6	0.0	24.4	25.6	23.1	76.9	0.0	23.1	23.1	0.47	0.68
Visualization/Guided Imagery	22.6	85.5	5.9	8.6	18.2	10.8	92.2	3.9	3.9	8.8	8.9	96.7	1.1	2.2	6.7	6.2	95.4	1.5	3.1	4.6	<.0001	0.91
Spirituality	22.3	79.0	2.7	18.3	20.6	16.7	84.3	1.0	14.7	15.7	12.2	87.8	1.1	11.1	12.2	24.6	76.9	0.0	23.1	23.1	0.09	0.71
Body/Energy/Other Treatments	66.0	45.1	34.7	18.8	26.7	57.8	54.9	31.4	13.7	25.5	58.9	51.1	36.7	11.1	26.7	58.5	56.9	21.5	21.5	20.0	0.19	0.70
Massage	47.1	63.8	32.6	3.7	11.0	37.3	74.5	21.6	3.9	10.8	43.3	66.7	30.0	3.3	17.8	32.3	75.4	21.5	3.1	9.2	0.04	0.09
Chiropractic care	38.6	75.9	17.2	6.9	6.5	25.5	85.3	9.8	4.9	4.9	24.4	84.4	13.3	2.2	4.4	12.3	90.8	3.1	6.2	0.0	<.0001	0.62
Acupuncture	25.7	85.5	11.4	3.1	3.2	14.7	90.2	7.8	2.0	2.9	26.7	84.4	14.4	1.1	1.1	23.1	92.3	6.2	1.5	1.5	0.11	0.43
Number of General CAM Modalities Used																						
0	2.7					3.9					7.8					4.6					0.15	
1	6.5					6.9					5.6					7.7						
2	13.3					18.6					17.8					13.9						
3	17.2					20.6					26.7					18.5						
4	27.4					27.5					24.4					30.8						
5	33.0					22.6					17.8					24.6						

*
P-value is for comparisons of ethnic groups.

†
Since diagnosis refers to the time between diagnosis and study enrollment.

Table 3

Multivariable odds ratios (and 95% confidence intervals) for frequent use of CAM modalities in the 5 years prior to breast cancer diagnosis on demographic and lifestyle factors (n=1,000), Pathways Study 2006-2007.

	Botanical OR (95% CI)	Other Natural Products OR (95% CI)	Special Diets OR (95% CI)	Mind-Body Approaches OR (95% CI)	Body/Energy/Other Treatments OR (95% CI)
Age at Diagnosis					
<50 years	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
50-59 years	0.81 (0.53, 1.24)	1.24 (0.81, 1.91)	1.09 (0.70, 1.70)	1.12 (0.73, 1.74)	0.89 (0.53, 1.50)
60-69 years	0.82 (0.53, 1.27)	2.46 (1.57, 3.86)	1.02 (0.64, 1.61)	0.87 (0.56, 1.35)	0.68 (0.40, 1.18)
70+ years	0.62 (0.38, 1.01)	2.62 (1.57, 4.38)	0.78 (0.46, 1.33)	0.90 (0.55, 1.49)	0.46 (0.24, 0.88)
Race/Ethnicity					
Non-Hispanic White	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Hispanic	0.89 (0.54, 1.46)	0.68 (0.41, 1.12)	0.48 (0.27, 0.87)	1.57 (0.93, 2.65)	0.59 (0.29, 1.19)
Asian	1.17 (0.67, 2.04)	0.65 (0.37, 1.12)	0.55 (0.29, 1.03)	1.02 (0.58, 1.79)	0.41 (0.17, 1.01)
African-American	1.28 (0.69, 2.37)	0.63 (0.33, 1.19)	0.68 (0.35, 1.32)	1.40 (0.75, 2.61)	1.03 (0.49, 2.15)
Other	1.76 (0.78, 3.97)	1.10 (0.48, 2.52)	0.46 (0.17, 1.19)	0.92 (0.41, 2.07)	1.14 (0.46, 2.84)
Educational Attainment					
High school or less	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Some college	1.07 (0.68, 1.67)	0.87 (0.55, 1.39)	1.27 (0.76, 2.11)	1.29 (0.83, 2.00)	1.37 (0.74, 2.51)
College graduate	0.97 (0.59, 1.59)	0.93 (0.56, 1.55)	1.39 (0.80, 2.40)	1.73 (1.06, 2.84)	1.05 (0.53, 2.08)
Post-graduate	1.16 (0.69, 1.95)	1.11 (0.65, 1.91)	2.11 (1.20, 3.70)	1.84 (1.09, 3.12)	1.63 (0.82, 3.24)
Household Income					
$90,000+	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
$50,000-89,999	1.19 (0.81, 1.74)	1.11 (0.75, 1.65)	0.97 (0.66, 1.44)	1.77 (1.20, 2.63)	1.36 (0.83, 2.24)
$25,000-49,999	1.19 (0.76, 1.85)	0.86 (0.55, 1.36)	1.26 (0.80, 1.98)	1.69 (1.08, 2.66)	1.66 (0.94, 2.92)
< $25,000	0.78 (0.43, 1.44)	0.56 (0.30, 1.04)	0.64 (0.32, 1.29)	2.78 (1.50, 5.18)	2.82 (1.35, 5.90)
Not reported	1.13 (0.66, 1.93)	0.74 (0.43, 1.29)	0.73 (0.41, 1.31)	1.52 (0.89, 2.60)	1.97 (1.00, 3.88)
Body Mass Index at Diagnosis					
<25 kg/m^2	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
25-30 kg/m^2	1.06 (0.74, 1.52)	0.92 (0.64, 1.34)	1.60 (1.10, 2.31)	1.12 (0.77, 1.61)	1.03 (0.65, 1.64)
>30 kg/m^2	0.82 (0.56, 1.18)	0.96 (0.66, 1.41)	1.35 (0.92, 1.98)	0.98 (0.67, 1.43)	1.20 (0.75, 1.92)
Fruit/Vegetable Intake Prior to Diagnosis					

	Botanical OR (95% CI)	Other Natural Products OR (95% CI)	Special Diets OR (95% CI)	Mind-Body Approaches OR (95% CI)	Body/Energy/Other Treatments OR (95% CI)
>=35 srv/week vs <35 srv/week	1.34 (1.00, 1.81)	0.92 (0.68, 1.26)	1.43 (1.05, 1.94)	1.25 (0.92, 1.70)	1.13 (0.78, 1.65)
Ever Use of Complementary and Alternative Medicine					
Herbal/botanicals, Yes vs No	---	3.70 (2.61, 5.24)	1.32 (0.90, 1.93)	1.66 (1.19, 2.33)	1.77 (1.07, 2.94)
Other natural products Yes vs No	2.91 (2.03, 4.16)	---	2.03 (1.34, 3.06)	1.59 (1.12, 2.26)	1.75 (1.04, 2.94)
Special diets Yes vs No	1.35 (0.97, 1.89)	1.99 (1.43, 2.78)	---	1.12 (0.80, 1.57)	1.35 (0.87, 2.12)
Mind-body healing Yes vs No	1.80 (1.27, 2.55)	1.26 (0.88, 1.79)	1.10 (0.75, 1.60)	---	1.98 (1.18, 3.34)
Body/energy/other treatments, Yes vs No	1.81 (1.32, 2.47)	1.72 (1.25, 2.37)	1.67 (1.18, 2.36)	2.43 (1.78, 3.30)	---

All odds ratios are adjusted for the other variables in the Table.

Table 4

Multivariable odds ratios (and 95% confidence intervals) for the use of CAM modalities since breast cancer diagnosis* on demographic, lifestyle, and clinical factors (n=1,000), Pathways Study, 2006-2007.

	Botanical	Other Natural Products	Special Diets	Mind-Body Approaches	Body/Energy/Other Treatments
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age at Diagnosis					
<50 years	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
50-59 years	0.78 (0.50, 1.21)	1.11 (0.72, 1.73)	1.20 (0.75, 1.93)	1.44 (0.90, 2.31)	1.03 (0.64, 1.66)
60-69 years	0.59 (0.37, 0.93)	1.74 (1.11, 2.74)	1.09 (0.67, 1.78)	1.02 (0.63, 1.64)	0.63 (0.38, 1.05)
70+ years	0.61 (0.36, 1.02)	1.89 (1.13, 3.15)	1.11 (0.64, 1.94)	0.83 (0.49, 1.41)	0.47 (0.26, 0.86)
Race/Ethnicity					
Non-Hispanic White	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Hispanic	0.94 (0.56, 1.58)	0.77 (0.45, 1.30)	0.54 (0.28, 1.01)	2.02 (1.14, 3.59)	1.12 (0.63, 2.02)
Asian	1.40 (0.78, 2.50)	0.46 (0.25, 0.83)	0.87 (0.46, 1.63)	1.05 (0.57, 1.93)	1.12 (0.58, 2.14)
African-American	1.12 (0.59, 2.16)	0.95 (0.49, 1.84)	0.93 (0.46, 1.86)	1.22 (0.62, 2.42)	0.68 (0.30, 1.52)
Other	2.09 (0.88, 4.93)	0.88 (0.37, 2.07)	0.25 (0.07, 0.90)	0.69 (0.29, 1.67)	1.71 (0.69, 4.25)
Educational Attainment					
High school or less	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Some college	1.06 (0.66, 1.71)	1.25 (0.77, 2.03)	1.20 (0.69, 2.09)	1.48 (0.92, 2.38)	1.80 (0.95, 3.41)
College graduate	1.14 (0.68, 1.92)	1.66 (0.98, 2.81)	1.21 (0.67, 2.20)	1.90 (1.12, 3.22)	1.70 (0.86, 3.36)
Post-graduate	1.16 (0.67, 2.00)	1.86 (1.07, 3.25)	2.24 (1.22, 4.09)	1.65 (0.95, 2.90)	2.45 (1.23, 4.89)
Household Income					
90,000+	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
$50,000-89,999	1.10 (0.74, 1.64)	1.06 (0.71, 1.58)	0.99 (0.65, 1.50)	1.44 (0.95, 2.20)	1.63 (1.05, 2.53)
$25,000-49,999	0.83 (0.52, 1.32)	0.78 (0.49, 1.24)	1.18 (0.73, 1.90)	1.59 (0.97, 2.58)	1.26 (0.74, 2.14)
< $25,000	0.68 (0.36, 1.28)	0.73 (0.39, 1.39)	0.58 (0.28, 1.24)	1.96 (1.02, 3.77)	1.72 (0.82, 3.57)
Not reported	1.62 (0.93, 2.83)	1.22 (0.70, 2.11)	0.87 (0.48, 1.57)	0.92 (0.53, 1.63)	1.44 (0.76, 2.71)
Body Mass Index at Diagnosis					
<25 kg/m^2	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
25-30 kg/m^2	0.66 (0.46, 0.96)	1.01 (0.70, 1.46)	1.02 (0.69, 1.50)	1.12 (0.76, 1.65)	0.91 (0.60, 1.38)
>30 kg/m^2	0.54 (0.37, 0.80)	0.55 (0.37, 0.81)	1.10 (0.74, 1.65)	0.89 (0.59, 1.32)	0.85 (0.55, 1.31)

	Botanical OR (95% CI)	Other Natural Products OR (95% CI)	Special Diets OR (95% CI)	Mind-Body Approaches OR (95% CI)	Body/Energy/Other Treatments OR (95% CI)
Fruit/Vegetable Intake Prior to Diagnosis					
>=35 srv/week vs <35 srv/week	1.30 (0.96, 1.77)	1.01 (0.74, 1.37)	1.78 (1.29, 2.46)	1.03 (0.75, 1.42)	1.35 (0.96, 1.92)
Ever Use of Complementary and Alternative Medicine					
Herbal/botanicals, Yes vs No	---	2.77 (1.92, 3.98)	1.16 (0.77, 1.74)	2.22 (1.55, 3.17)	2.26 (1.41, 3.63)
Other natural products Yes vs No	2.60 (1.78, 3.78)	---	1.70 (1.11, 2.60)	1.23 (0.84, 1.80)	1.65 (1.04, 2.62)
Special diets Yes vs No	1.40 (0.99, 1.99)	1.72 (1.22, 2.42)	---	1.15 (0.81, 1.64)	1.53 (1.02, 2.30)
Mind-body healing Yes vs No	2.37 (1.64, 3.44)	1.10 (0.76, 1.58)	1.55 (1.03, 2.34)	---	3.23 (1.95, 5.36)
Body/energy/other treatments, Yes vs No	1.44 (1.04, 2.00)	1.39 (1.00, 1.94)	1.33 (0.93, 1.90)	2.54 (1.84, 3.52)	---
Clinical Characteristics					
ER- and PR- vs ER+ or PR+	1.08 (0.51, 2.33)	2.11 (0.98, 4.54)	0.82 (0.34, 1.97)	1.25 (0.54, 2.87)	0.37 (0.15, 0.91)
HER2/neu Positive vs Negative	0.81 (0.54, 1.21)	0.84 (0.56, 1.26)	0.86 (0.56, 1.31)	1.14 (0.76, 1.73)	1.61 (1.05, 2.49)
Triple Negative, Yes vs No	1.01 (0.40, 2.55)	0.33 (0.13, 0.83)	1.08 (0.39, 3.04)	0.87 (0.32, 2.34)	2.46 (0.84, 7.23)

All odds ratios are adjusted for the other variables in the Table.

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In the period between breast cancer diagnosis and study enrollment.