Complementary Medicine Use among Women Enrolled in a Genetic Testing Program[1]

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Abstract

The purpose of this study is to explore complementary and alternative medicine (CAM) use and factors influencing CAM use by women enrolled in a genetic testing program for predisposition to breast/ovarian cancer. A cohort of 236 high-risk women completed baseline questionnaires at enrollment into *BRCA1/2* testing program. CAM use and correlates of use were assessed using logistic regression models. CAM was used by 53% of the overall cohort. Cancer survivors reported significantly more use of complementary treatments than did unaffected women (61 *versus* 42%; $P < 0.05$). Participants had good overall health behaviors; daily fruit/vegetable consumption was significantly related to CAM use. Increased depression level, knowledge of cancer genetics, and frequency of breast self-examination were significantly associated with using CAM for cancer survivors. Among unaffected women only, cancer risk perception and sunscreen use were significantly correlated with CAM use. Recognition of heightened breast cancer risk is correlated with increased complementary therapy use by unaffected women undergoing genetic testing for cancer predisposition but not to the extent that cancer survivors use these strategies. Any potential effects of the genetic information itself on CAM use, and any possible relationship of CAM use to other risk reduction behaviors, require further research.

Introduction

CAM[3] is broadly defined as medical practices that are not generally taught in medical schools nor widely available in United States hospitals (1). CAM includes a wide array of healing philosophies, therapies, and approaches typically not considered an essential part of conventional medicine (2). Characteristics that have been found to significantly predict CAM use include higher income and educational levels, female gender, and younger age (1, 3, 4). CAM has gained a major presence in the industrialized world in recent years, and reports of its use by individuals with cancer and other chronic diseases have been rapidly increasing (5, 6). Use of ≥1 of 16 CAM interventions in the preceding year increased from 33% of the United States population in 1990 to 42% in 1997, and the percentage of individuals visiting a CAM practitioner increased from 36 to 46% during this time period (1). Annual visits to CAM practitioners are estimated to far exceed visits to traditional primary care physicians by ≤243 million visits (5). CAM has been reported as being more beneficial than traditional medicine for certain physical ailments, such as chronic back (46 *versus* 12%) and neck (61 *versus* 6%) conditions (7). CAM techniques have also been used to treat mental health-related concerns, such as depression and anxiety (1, 8).

CAM use is typically higher among cancer patients than in the general population, with reports ranging from 63% (9) to 83% (10) of cancer patients, indicating use of at least one type of CAM. Women diagnosed with breast cancer tend to use CAM more often than individuals diagnosed with other types of malignancy (11). Cancer patients report high use of individual types of CAM, including spiritual practices (81%), vitamins/herbs (63%), and movement and physical interventions (59%) (10). Most preliminary studies have focused on cancer patients' use of CAM to help ease the hardships associated with being in a clinical trial or undergoing traditional cancer treatment (9, 12–15). It is unknown whether early CAM trials have the potential to affect cancer at traditional end points (16).

We sought to assess the use of complementary medicine and factors that may influence CAM use by a cohort of women exploring their *BRCA1/2* status. Few studies have explored complementary medicine use by individuals at high genetic risk for cancer. High-risk women face unique health management decisions because they are often more likely to develop cancer than those in the general population. Assessing their health surveillance and the impact of these practices on behavioral outcomes warrants ongoing attention. CAM may be chosen as part of health monitoring in hopes of decreasing cancer risk without adverse effects. Furthermore, women found to have *BRCA1/2* gene alterations must contend with making difficult health care decisions, such as whether to have prophylactic mastectomy and/or oophorectomy. Additional factors have been shown to also play a role with breast cancer and high-risk populations. Depression has been found to impact CAM use among women with early stage breast cancer (17). Cancer risk perception and knowledge of cancer genetics are pertinent issues for women at high cancer risk and may potentially modify behavioral outcome (18–20). The results of our study will provide a preliminary understanding of the role played by CAM in the lives of women interested in their risk of hereditary breast/ovarian cancer predisposition.

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[3] The abbreviations used are: CAM, complementary and alternative medicine; BSE, breast self-examination; CI, confidence interval; OR, odds ratio.

Materials and Methods

Program Description. Women from cancer risk assessment clinics or clinical oncology practices participating in an NHGRI-funded randomized study of two genetic counseling interventions were offered enrollment between December 1, 1998 and July 1, 2001. A total of 369 women was invited to participate in the program through December 30, 2000. Of that number, 252 women (68%) enrolled, and 117 women (32%) declined participation. Among the 252 enrollees were 16 women with breast cancer who were excluded from this analysis because they reported either ongoing cancer treatment or recurrent or metastatic disease at the time of program enrollment. This was done to minimize the possibility that reported CAM use might be for treatment of active cancer rather than for cancer prevention. Thus, this study includes data from the 236 women (132 cancer survivors and 104 unaffected participants) who enrolled during the specified time period. Analyses are based on baseline data collected before genetic testing.

Women were required to meet the following eligibility criteria: (*a*) age $\geq$18; (*b*) personal or family history of breast, ovarian, or other cancer consistent with *BRCA1/2* heredity with posterior probability of carrying an altered gene of $\geq$10% based on published probabilities and Bayesian calculations; and (*c*) documentation of participant or family member cancer diagnosis. Women who met the eligibility criteria were mailed an enrollment packet, which contained the baseline questionnaire, informed consent, medical insurance information form, if applicable, and project brochure. On receipt of the completed enrollment packet materials at the study center at the Dana-Farber Cancer Institute, project staff enrolled each participant and randomized her to either a genetic counseling or oncology nurse-enhanced consent intervention. Participants were required to attend two visits at their study site and received their *BRCA1/2* test result during their second appointment. Women were followed for 1-year after receiving their genetic test results. A federal Certificate of Confidentiality was obtained to prevent undesired disclosure of personal information. The Institutional Review Board at the Dana-Farber Cancer Institute and participating institutions approved this study.

Measures. Completion of an enrollment questionnaire was required for entry into the program; therefore, the response rate for this survey is 100% of program enrollees. Standard demographic information, including cancer history, was collected from all interested study participants before the mailing of the enrollment packet. The enrollment and demographic instruments provide the data sources for this study.

Complementary Medicine Use. Participants were asked about their use of the following CAMs: (*a*) vitamins; (*b*) special diet; (*c*) herbal remedies (grouped as "dietary CAM"); (*d*) exercise, meditation/yoga; (*e*) massage therapy; (*f*) energy work; and (*g*) acupuncture/acupressure (designated as "physical CAM"). Subjects were classified as CAM users if they reported using at least one therapy out of the eight categories for cancer prevention.

Demographics and Health Behaviors. Standard demographic and health history information was obtained from our sample: (*a*) cancer history; (*b*) age; (*c*) education; (*d*) ethnic derivation; (*e*) number of children; (*f*) marital status; and (*g*) annual household income.

Health surveillance behaviors may have an influence on cancer outcome (21). The relationship between individual health behaviors and CAM use is unknown. The following questions concerning participants' health behaviors were included in this analysis because of the variability of these behaviors among this sample: "Do you see a dermatologist for skin exams or to have moles screened for signs of cancer?" This item was measured on a four-point scale, ranging from "yes at least once a year" to "no." "How often do you wear sunscreen with an SPF of 15 or more, when you are in the summer sun for more than 15 min?" This item was measured on a five-point Likert scale ranging from "never" to "always." "Do you perform breast self-examinations (BSE)?" This item was measured on a six-point scale, ranging from "yes regularly (at least once/month)" to "no because I have had both of my breasts removed." For purposes of this analysis, health behavior variables were dichotomized into "rarely" and "often."

Nutrition. The relationship between diet and breast cancer is less clear than thought previously (22, 23), and further research in this area is ongoing. The National Cancer Institute's Five-A-Day for Better Health project developed a seven-item standardized scale to measure fruit and vegetable intake (24). The items assessed the frequency and number of daily servings of orange or grapefruit juice; other fruit juices; green salad; french fries or fried potatoes; baked, boiled, or mashed potatoes; vegetables other than salad or potatoes; and fruit, not counting juices. An algorithm was designed that measured intake into "less than 5 fruits/vegetables consumed per day" *versus* "5 or more fruits/vegetables consumed daily."

Worry about Cancer Risk. Risk perception plays a considerable role in many preventive health theories, including the Health Belief Model (25). Participants in our study were asked to provide a categorical response to the following question: "How worried are you about your risk of developing (another) breast cancer?" Response choices for this item ranged from "not at all" to "extremely." For the purposes of this analysis, this variable was dichotomized into "not worried" and "worried" about cancer risk.

Genetics Knowledge. Knowledge of cancer genetics is an important consideration for women at high cancer risk (26). Participants were asked 23 questions about their knowledge of cancer genetics in five distinct domains: (*a*) overall knowledge; (*b*) basic genetics/inheritance; (*c*) *BRCA1/2*-related cancer risks; (*d*) cancer risk factors; and (*e*) confidentiality of genetic test results. This analysis focuses on participants' overall cancer genetics knowledge score for the 23 items. For the purposes of this analysis, this variable was dichotomized at the sample mean into low and high knowledge.

Depression. Early studies have shown depression levels to be correlated with CAM use (17). Therefore, we considered emotional state to be an important consideration in exploration of CAM use among our sample. Depression was evaluated using the standardized depression subscale of the 53-item Brief Symptom Inventory (27). Participants were asked about their emotional well being in the past 7 days, with response categories on a five-point Likert scale, ranging from "not at all" to "extremely." Several standardized subscales were calculated, including an index of depression, which was dichotomized at the sample mean into "lower" and "higher depression score."

Statistical Analysis. Statistical analyses were conducted using SAS software (28), and crosstabular comparisons were made using Fisher's exact tests. All *P*s reported were two tailed, with a level of $P < 0.05$ to determine statistical significance. Participant characteristics of CAM users and nonusers and type of CAM use (overall, physical, and dietary) were explored. Cancer survivors and unaffected participants were analyzed separately in all cases. Univariate analyses were conducted to compare CAM users and nonusers on the following domains: (*a*) cancer genetics knowledge; (*b*) depression levels; (*c*) cancer risk per-

Table 1 Characteristics of study participants and women who declined program participation

	Study participants[a] (n = 236) n (%)	Declined participation[b] (n = 117) n (%)	P
Age			
18–45	119 (50)	57 (51)	1.00
≥46	117 (50)	55 (49)	
Ethnicity			
Non-Jewish	143 (61)	81 (72)	0.06
Jewish	93 (39)	32 (28)	
Children			
0	52 (22)	28 (25)	0.50
≥1	184 (78)	82 (75)	
Marital Status			
Married	185 (78)	79 (74)	0.41
Other	51 (22)	28 (26)	
Education			
Less than college	40 (17)	36 (35)	0.0004
College plus	193 (83)	66 (65)	
Annual Household Income			
<$65,000	55 (26)	32 (35)	0.13
≥$65,000	158 (74)	60 (65)	

[a] Because of missing data, the number of study participants does not always total 236.
[b] Because of missing data, the number of decliners does not always total 117.

ception; (*d*) nutrition; and (*e*) the individual health behaviors. All covariates were entered into a stepwise logistic regression model to explore their relationship with CAM use.

Results

Participant Characteristics. Comparison was made on the demographic indicators comparing program participants with those who declined study participation (Table 1). Education was the only item that reflected a significant difference between the two groups; 83% of study participants compared with 65% of program decliners had at least a college education (P = 0.0004). There was no significant difference in the two groups with regard to age, Jewish ethnicity, number of children, or marital status. There was also no difference regarding income, with the majority of women from both groups reporting an annual household income of $65,000 or greater ($P$ = 0.13). Additionally, 100% of study participants and program decliners were Caucasian. Comparison of demographic factors was also performed for CAM users *versus* nonusers (cancer survivors and unaffected participants analyzed separately). No differences were found with regard to age, Jewish ethnicity, marital status, education, or annual household income (data not shown).

Among study participants, 50% had been diagnosed with breast cancer, 5% with ovarian cancer, and <1% with other cancers before enrollment into the genetic testing program. A proportion (44%) of the cohort did not have a cancer diagnosis.

Complementary Medicine Use and Health Behaviors. Preliminary analysis explored differences between cancer survivors and unaffected participants regarding overall CAM use and subgroups physical and dietary CAM use. A proportion (53%) of our overall sample reported using at least one type of CAM at entry into the genetic testing program. Cancer survivors consistently reported more use of CAM than did unaffected participants, in particular use of overall and physical CAM (Table 2). A proportion (61%) of cancer survivors and 42% of unaffected participants reported using CAM (P = 0.006). A proportion (23%) of cancer survivors and 33% of unaffected participants used one or two CAMs, and 38% of survivors and 10% of unaffected women used three or more CAMs (P = 0.0002). Any type of physical intervention was used by 51% of cancer survivors and 25% of unaffected participants (P = 0.0006). Exercise was the most commonly used type of physical CAM (47% cancer survivors and 22% unaffected participants; P = 0.0007). Nearly half of cancer survivors (49%) used any type of dietary CAM, compared with 38% of unaffected participants (P = 0.09). The most commonly used types of dietary therapies were vitamins (43% cancer survivors and 32% unaffected participants; P = 0.08) and special diet (34% cancer survivors and 15% unaffected participants; P = 0.001).

Table 2 Complementary medicine use by cancer status

	Cancer survivors (n = 132) n (%)	Unaffected participants (n = 104) n (%)	P
Overall CAM use	80 (60.6)	44 (42.3)	0.006
Number of CAMs used			
0	52 (39.4)	60 (57.7)	0.0002
1–2	30 (22.7)	34 (32.7)	
≥3	50 (37.9)	10 (9.6)	
Any physical CAM use	67 (50.8)	26 (25.0)	0.0006
Exercise	62 (47.0)	23 (22.1)	0.0007
Meditation/yoga	27 (20.4)	6 (5.8)	0.001
Massage therapy	20 (15.1)	3 (2.9)	0.002
Energy work	13 (9.9)	0 (0.0)	0.0007
Acupuncture/acupressure	11 (8.3)	1 (0.9)	0.01
Any dietary CAM use	65 (49.2)	39 (37.5)	0.09
Vitamins	57 (43.2)	33 (31.7)	0.08
Special diet	45 (34.1)	16 (15.4)	0.001
Herbal remedies	20 (15.1)	4 (3.8)	0.004

Our overall sample reported generally good health behaviors, including low current smoking rates (8%). Additionally, nearly half consumed five or more daily servings of fruits/vegetables (mean number of daily servings = 4.4), 66% used sunscreen regularly, 77% performed routine BSE, and 31% regularly saw a dermatologist for cancer prevention. No differences were observed on these items by cancer status.

Association between CAM Use and Genetics Knowledge, Depression, Risk Perception, and Health Behaviors. Univariate analyses are reported in Table 3 and logistic regression analyses in Table 4. All analyses were conducted separately for cancer survivors and unaffected participants. The following items and their relationship with CAM use were explored: (*a*) level of genetics knowledge; (*b*) depression; (*c*) cancer risk perception; (*d*) daily consumption of fruit/vegetable servings; (*e*) frequency of seeing a dermatologist for cancer prevention; (*f*) sunscreen use; and (*g*) performance of BSE. Other health surveillance items, including alcohol and cigarette use, were explored in preliminary analysis; however, they were not included in additional analysis because of low use in these behaviors among our sample. Demographic indicators were included in the logistic regression analysis to assess impact on CAM use. Similar predictors of overall CAM use and subgroups physical and dietary CAM use were noted on logistic regression analysis. Therefore, the remainder of our discussion focuses on predictors of overall CAM use; correlates of physical CAM use are provided for reference in the tables.

Table 3 Genetics knowledge, depression, risk perception, and health surveillance practices by cancer status and type of CAM use

	Cancer survivors				Unaffected participants			
	Physical CAM use		Overall CAM use		Physical CAM use		Overall CAM use	
	Users (%) (n = 67)	Nonusers (%) (n = 65)	Users (%) (n = 80)	Nonusers (%) (n = 52)	Users (%) (n = 26)	Nonusers (%) (n = 78)	Users (%) (n = 44)	Nonusers (%) (n = 60)
Genetics knowledge								
Low	28 (42)[a]	41 (63)[a]	32 (40)[b]	37 (71)[b]	9 (35)	31 (40)	16 (36)	24 (40)
High	39 (58)	24 (37)	48 (60)	15 (29)	17 (65)	47 (60)	28 (64)	36 (60)
Depression								
Not depressed	31 (48)[a]	43 (68)[a]	38 (49)[a]	36 (72)[a]	16 (61)	51 (66)	25 (58)	42 (70)
Depressed	34 (52)	20 (32)	40 (51)	14 (28)	10 (38)	26 (34)	18 (42)	18 (30)
Risk Perception								
Not worried	33 (50)[a]	44 (69)[a]	42 (53)	35 (69)	16 (61)	52 (68)	24 (55)[a]	44 (76)[a]
Worried	33 (50)	20 (31)	37 (47)	16 (31)	10 (38)	24 (32)	20 (45)	14 (24)
Daily servings of fruits/ vegetables								
<5 servings/day	24 (36)[b]	42 (66)[b]	31 (39)[b]	35 (69)[b]	12 (46)	42 (57)	19 (43)	35 (63)
5+ servings/day	42 (64)	22 (34)	48 (61)	16 (31)	14 (54)	32 (43)	25 (57)	21 (38)
See dermatologist regularly for cancer prevention								
Rarely	38 (57)[a]	49 (75)[a]	47 (59)[a]	40 (77)[a]	16 (62)	59 (76)	29 (66)	46 (77)
Often	29 (43)	16 (25)	33 (41)	12 (23)	10 (38)	19 (24)	15 (34)	14 (23)
Sunscreen use								
Rarely	16 (24)	23 (35)	20 (25)	19 (36)	4 (15)[a]	37 (47)[a]	13 (30)	28 (47)
Often	51 (76)	42 (65)	60 (75)	33 (63)	22 (85)	41 (53)	31 (70)	32 (53)
Perform breast self exam								
Rarely	11 (16)[a]	23 (35)[a]	13 (16)[a]	21 (40)[a]	7 (27)	14 (18)	11 (25)	10 (17)
Often	56 (84)	42 (65)	67 (84)	31 (60)	19 (73)	64 (82)	33 (75)	50 (83)

[a] $P < 0.05$.
[b] $P < 0.001$.

Cancer Survivors. Cancer survivors were not significantly more depressed than unaffected participants (42 *versus* 35%; $P = 0.2$). Significant differences were found in the univariate analyses between users and nonusers of overall CAM for cancer survivors with respect to cancer genetics knowledge, depression levels, daily nutrition, dermatologist visits, and performance of BSE. Cancer CAM users were significantly more depressed (51 *versus* 28%; $P < 0.05$) and had significantly greater knowledge of cancer genetics (60 *versus* 29%; $P < 0.001$) than cancer CAM nonusers. Among women with cancer, CAM users were also significantly more likely to consume five or more daily servings of fruits/vegetables (61 *versus* 31%; $P < 0.001$), visit a dermatologist regularly for cancer prevention (41 *versus* 23%; $P < 0.05$), and perform regular BSE (84 *versus* 60%; $P < 0.05$) than nonusers of CAM.

Logistic regression analysis confirmed the same pattern for cancer survivors who used CAM. For this group, we found significantly higher depression levels (OR, 4.6; 95% CI, 1.8–11.6), greater knowledge of cancer genetics (OR, 3.6; 95% CI, 1.4–9.3), daily consumption of five or more fruits/vegetables (OR, 2.5; 95% CI, 1.1–5.9), and routine performance of BSE (OR, 3.4; 95% CI, 1.3–9.1). For cancer survivors, no significant relationship was found in the logistic regression analysis between cancer risk perception and other health behaviors (frequency of visiting a dermatologist and sunscreen use) with use of CAM. Demographic indicators were not correlated with CAM use for women with cancer.

Unaffected Participants. For unaffected participants, univariate analysis identified fewer factors significantly influencing overall CAM use. Although genetics knowledge, depression, daily consumption of fruits and vegetables, and performance of BSE did not significantly come into play for this group, cancer risk perception was statistically correlated with CAM use. Unaffected CAM users were significantly more likely than unaffected non-CAM users to worry about their cancer risk (45 *versus* 24%; $P < 0.05$).

Logistic regression showed that overall CAM use for unaffected participants was predicted by greater perceived cancer risk (OR, 3.2; 95% CI, 1.3–7.8), regular sunscreen use (OR, 2.5; 95% CI, 1–6.4), and daily fruit/vegetable consumption (OR, 2.4; 95% CI, 1.1–5.2). Demographic indicators were not correlated with CAM use for women without cancer.

Discussion

This study explored patterns of CAM use and factors influencing CAM use among a cohort of women enrolled in a genetic testing program for breast/ovarian cancer predisposition. All women in our cohort were Caucasian, and the majority had at least a college education and an annual income of $65,000 or more. About half of our overall sample reported use of at least one type of CAM at entry into the genetic testing program. Comparing the group by cancer status, CAM use was significantly more prevalent among women who had cancer compared with unaffected participants. This is comparable with previous studies that have found higher CAM use among cancer patients than is typically seen in general population studies (1, 9–11). Among our unaffected women, recognition of heightened breast cancer risk did increase CAM use, however, not to the extent that our cancer survivors used complementary techniques.

Our cohort reported generally better health behaviors than women in the general population, with no differences noted on these items by cancer status. Recent studies of individuals in the United States report higher cigarette smoking rates among women (29), lower routine sunscreen use (30), and less consumption of

Table 4 Logistic regression model: predictors of overall and physical CAM use by cancer status

Cancer survivors	Odds ratio	95% confidence intervals	*P*
Overall CAM use			
Depression	4.6	1.8–11.6	0.001
Genetics knowledge	3.6	1.4–9.3	0.007
Daily consumption of fruits/vegetables	2.5	1.1–5.9	0.03
Frequency of breast self-examination	3.4	1.3–9.1	0.01
Physical CAM use			
Depression	3.3	1.4–7.6	0.004
Daily consumption of fruits/vegetables	3.3	1.5–7.3	0.002
Frequency of breast self-examination	3.0	1.2–7.7	0.02
Unaffected participants			
Overall CAM use			
Risk perception	3.2	1.3–7.8	0.01
Sunscreen use	2.5	1.0–6.4	0.04
Daily consumption of fruits/vegetables	2.4	1.1–5.2	0.03
Physical CAM use			
Sunscreen use	5.5	1.7–17.8	0.004

five or more daily servings of fruits/vegetables (24) than were reported by our cohort. Our findings are consistent with previous observations that women exploring their genetic risk for cancer predisposition have better health surveillance habits compared with individuals in the general population (31). We have also considered the possibility that the better health behaviors of our cohort may be attributable to their higher socioeconomic status. However, national data on highly educated women who may be more comparable with our sample continue to support the trends of higher smoking prevalence (29) and lower daily fruit/vegetable consumption (24) than we observed in our cohort. In addition, CAM use has been associated with health and disease prevention choices among the United States population (32). We found that several health surveillance behaviors were correlated with CAM use, indicating that among our cohort interested in genetic testing, CAM use may be one component of a larger cancer preventive regimen.

Overestimating cancer risk is one of the factors found to motivate women to explore their genetic predisposition to breast cancer (19). However, a recent study found that it does not appear that receiving a *BRCA1/2*-positive test result leads to increased motivation regarding health surveillance behaviors among unaffected women (18). This study reported that unaffected mutation-positive carriers did not increase mammography practices, and most did not choose prophylactic surgical interventions in the 1-year after genetic test disclosure. In our data, heightened perceived cancer risk was significantly associated with CAM use for unaffected women. However, despite the relationship between risk perception and the use of treatment alternatives, our unaffected cohort appeared to be less motivated than our cancer survivors to pursue presumably nontoxic CAM interventions. The level of cancer genetics knowledge is also an important consideration in assessing women's motivations for exploring their *BRCA1/2* status (33). We found that a greater knowledge of cancer genetics among our cancer survivors appeared to be another incentive for seeking CAM.

Depression and anxiety have been found to affect health behavior choices made by women with high cancer risk (34) and may even impact quality-of-life decisions after being diagnosed with cancer (35). We found a correlation between higher levels of depression and CAM use for cancer survivors only, who did report somewhat more elevated levels of depression than did unaffected women. The association between CAM use and depression is consistent with the observations of Burstein *et al.* (17), who found a poorer quality of life and greater psychosocial distress among 480 CAM users with early-stage breast cancer than among non-CAM users. Poorer emotional health scores were reported among a cohort of disease-free cancer survivors that reported use of various herbal treatments, including ginseng and St. John's Wort (36). In a smaller study, patients enrolled in National Cancer Institute clinical trials reported CAM use for a variety of treatment-related issues, including depression and anxiety (9). However, Edgar *et al.* (37) observed that CAM users completing breast cancer treatment were more depressed than nonusers but scored high on the use of problem-solving coping skills. The authors interpreted this finding to indicate that CAM use represented a thoughtful approach to dealing with cancer. In our study, CAM use was not correlated with length of time since cancer diagnosis. However, two-thirds of our sample were diagnosed with cancer <5 years ago. Perhaps cancer patients in our cohort were motivated to use more CAM than unaffected women because of stressful situations faced by cancer survivors, such as fear of disease recurrence.

Some limitations to this study should be noted. First, previous studies have shown that socioeconomic status has a significant impact on CAM use (1, 3, 4). The majority of our sample had high education and annual income levels, as has been typical for many studies of women participating in genetic testing for breast/ovarian cancer susceptibility (38). Therefore, although our findings may be generalizable to other similar nondiverse groups of genetically tested individuals, as *BRCA1/2* testing becomes more commonplace among disparate groups, these findings will become less generalizable. Second, women were not asked frequency of CAM use, when CAM use began, motivations for CAM use, or methods of communicating CAM use with traditional healthcare providers. It would have been particularly beneficial to explore frequency of incorporating CAM into their healthcare practices to determine whether cancer survivors began using CAM (before or after cancer diagnosis) and also to compare type of CAM use before and after diagnosis.

This study indicates that women presenting for genetic testing may not consider their cancer risk yet sufficient to merit adoption of CAM to any greater extent than individuals in the general population. These women already use established health behaviors, including several surveillance practices and a healthy diet. Some distinctions were noted comparing the sample by cancer status. Despite the relationship of increased risk perception to CAM use for women without cancer, our cancer survivors appeared more motivated to seek nontraditional health surveillance alternatives than did unaffected women. Additionally, CAM use by cancer survivors appeared to be influenced by issues related to depression, as well as an increased knowledge of cancer genetics. Future data will be available from this project that will allow for comparison of CAM use at enrollment into the genetic testing program with CAM use and health behaviors 1-year after *BRCA1/2* test disclosure. In particular, we will explore the impact of receiving genetic information on CAM use and assess whether women who receive positive *BRCA1/2* test results are more likely to use CAM compared with those who receive negative or inconclu-

sive results. Given the concerning findings that a positive *BRCA1/2* test result does not improve standard breast health surveillance practices among carriers aware of their status (18), we are interested to see whether more unconventional health behaviors are altered by genetic test results.

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