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Associations Between Cancer Screening Behavior and Complementary Medicine Use: Results of a National Cross-Sectional Survey of 9151 Australian Women

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Abstract

Introduction: Complementary medicine (CM) use has been found to influence the uptake of conventional cancer treatment. This study examines associations between CM use and cancer screening rates. **Methods:** Women aged 62 to 67 years from the Australian Longitudinal Study on Women's Health were surveyed regarding their use of cancer screening initiatives. Associations between cancer screening behavior and visits to CM practitioners were analyzed. **Results:** Of the 9151 women, 9049 (98.9%) completed questions about cancer screening. A total of 65.1% of women had received a clinical skin examination, 54.3% colorectal cancer screening, 56.2% Pap test (within past 2 years), 83.3% mammogram (within past 2 years), 55.8% clinical breast examination, and 55.8% had conducted breast self-examination. Women who had consulted a massage therapist were more likely to undergo clinical skin examination ($P = .002$), clinical breast examination ($P = .018$), and mammogram ($P = .001$). Women who had consulted a chiropractor were more likely to undergo a clinical skin examination ($P = .001$), colorectal cancer screening ($P = .020$), and mammogram ($P = .011$). Women who had consulted an acupuncturist were more likely to undergo colorectal cancer screening ($P = .019$), and those who consulted with an osteopath were more liable to have a Pap test ($P = .049$). **Conclusion:** Women who visit CM practitioners are more likely to participate in cancer screening initiatives. Research is required to understand the current and potential role that CM practitioners (can) have as public health advocates, recommending preventative health measures such as cancer screening. Such an examination will help ensure optimal screening utilization and effective, timely care for all cancer patients.

Keywords

oncology, preventive medicine, epidemiology, women's health, cancer screening, complementary medicine

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Introduction

Cancer screening is an important public health initiative that enables early detection of cancer or precancerous changes. In Australia, the current *Guidelines for Preventative Activities in General Practice* (ninth edition) published by the Royal Australian College of General Practitioners (2016) recommends performing a Papanicolaou (Pap) test every 2 years.[1] The screening recommendation for Australian's National Cervical Cancer Screening Program will change in December 2017 to recommend women aged 25 to 74 years have a Pap test every 5 years.[1] A mammogram is recommended every 2 years for low-risk women, and colorectal cancer screening with occult blood testing at least every 2 years, for women aged 50 to 64 years. General practitioners (GPs) are also recommended to regularly enquire with patients about skin changes and early signs of skin cancer[1] due to the high rate of melanoma in Australia.[2]

Despite the availability of cancer screening to detect common forms of cancer and strong general practice

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guidelines, many women do not partake in these screening programs. In 2016, it was predicted that 13 280 new cases of melanoma would be diagnosed in Australia, of which 41% will be in women.[3] However, the number of women participating in skin cancer screening in Australia is not recorded.[3] Breast cancer is the most common cancer affecting Australian women, and BreastScreen Australia is the national breast cancer screening program that primarily targets women aged between 50 and 74 years.[4] In 2014-2015, 54% of Australian women in the target range participated in breast screening (screening conducted in BreastScreen Centers by breast screening doctors and nurses throughout Australia).[4] While the rates of cervical cancer are much lower than breast and skin cancer in Australia (around 7 in every 100 000 women), it is largely a preventable disease. However, only 57% of women aged 20 to 69 years participate in Pap testing.[5] The National Bowel Cancer Screening Program provides free colorectal cancer screening for adults in targeted age groups, and 47% of women aged 60 to 64 years participated in 2013-2014.[6]

The use of complementary medicine (CM)—a diverse group of products and practices located outside of the dominant medical system of training and practice[7]—has increased in recent years.[8] CM users are more frequently female and older (mid-age) and are higher users of health care services generally when compared with adults who do not use CM.[7,8]

While research demonstrates that women with cancer are high users of CM,[8-10] only limited research to date has contemplated the association between participation in cancer screening initiatives and the use of CM. A review of CM use and early breast cancer detection found 2 studies that reported a positive relationship between CM use and mammography, while another 2 studies found no relationship.[11] Additionally, one study found that women were less likely to have a mammogram if they saw a naturopath and more likely if they used massage therapy.[11] While GP visits have been found to be predictive of increased health checks including cancer screening,[12] we need to further understand the relationship between women's consultations with CM practitioners and participation in broader cancer screening. This study was conducted to advance our understanding of the relationship between CM use and cancer screening, in Australian women aged 62 to 67 years.

Methods

Survey Methodology

The study analyzed data from the Australian Longitudinal Study on Women's Health (ALSWH), which has been designed to assess the health, well-being, and associated factors of Australian women over a 20-year period. Women in 3 different age groups (18-23, 45-50, 70-75 years) were randomly selected from the national Medicare database in 1996.[13] Respondents have been shown to be broadly representative of the national population of women in their respective age cohorts.[14] Questionnaires were mailed to survey participants every 3 years on average. For this substudy on CM use and cancer screening, analyses focused on 9151 women from the mid-age ALSWH cohort, who were aged between 62 and 67 years at the time of the 2013 survey.

Cancer Screening Rates and Initiatives

The questionnaire included items on the following cancer screening initiatives: (*a*) clinical skin examination by a doctor (eg, spots, lesions, and moles) within the past 3 years; (*b*) colorectal cancer screening within the last 3 years; (*c*) Pap test (date of most recent test); (*d*) mammography (date of the last mammogram); (*e*) clinical breast examination (breast examined by a doctor or a nurse); or (*f*) regular monthly breast self-examination. Women could answer yes or no to questions *a, b, e*, and *f*; questions *c* and *d* were dichotomized into "received it within the past 2 years" or "did not receive it" as per official recommendation for Pap tests and mammograms.

Complementary and Alternative Medicine Utilization

The questionnaire included items on consultations with CM practitioners within the previous 12 months, including massage therapists, naturopaths/herbalists, chiropractors, acupuncturists, or "other" alternative health practitioners (eg, aromatherapists, homoeopaths, reflexologists, and iridologists). Women could answer yes or no to these questions.

Ethics

The ALSWH has been approved by the University of Newcastle's Human Research Ethics Committee (H-076-0795 and H-2012-0256) and the University of Queensland's Medical Research Ethics Committee (2004000224 and 2012000950). All participants gave written informed consent.

Statistical Analyses

Chi-squared tests were used to examine the association between cancer screening and consultation with a CM practitioner. Multiple logistic regression analyses were conducted to determine whether CM practitioner visits (independent variables) were associated with having participated in cancer screenings (dependent variables). Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were computed for all predictor variables. Analyses were adjusted for sociodemographic characteristics and known confounding variables (marital status, education, income, the area of

Table 1. The Bivariate Association Between Consulting Complementary Medicine Practitioners and Cancer Screening Behaviors, in 9151 Australian Women Aged 62 to 67 Years.[a]

Health Care Practitioner	Consulted	Clinical Skin Examination	*P*	Colorectal Cancer Screen	*P*	Pap Test	*P*	Mammogram	*P*	Clinical Breast Examination	*P*	Breast Self-examination	*P*
Naturopath/ herbalist	No (%)	64.5	<.001	54.2	.338	56.1	.076	83.8	<.001	55.3	.001	55.7	.454
	Yes (%)	71.5		56.1		56.9		77.2		61.9		57.2	
Massage therapist	No (%)	63.3	<.001	54.1	.562	55.7	.048	82.6	.004	54.2	.001	56.0	.519
	Yes (%)	70.1		54.8		58.1		85.2		60.5		55.2	
Chiropractor	No (%)	64.1	<.001	53.5	<.001	55.9	.081	82.9	.011	55.5	.174	55.8	.927
	Yes (%)	70.8		59.0		58.5		85.7		57.5		55.9	
Osteopath	No (%)	64.8	.014	54.2	.241	56.1	.067	83.4	.330	55.4	.016	55.9	.258
	Yes (%)	70.7		57.1		60.7		81.5		61.5		53.1	
Acupuncturist	No (%)	64.4	.002	54.1	.048	56.2	.583	83.5	.031	55.3	.004	55.8	.979
	Yes (%)	70.9		58.4		57.4		80.0		61.6		55.9	
"Other" alternative health practitioner	No (%)	65.0	.237	54.4	.789	56.1	.372	83.6	<.001	55.5	.027	56.0	.159
	Yes (%)	67.7		53.8		58.3		76.2		60.8		52.6	

[a]Data are presented as percentage of respondents.

residence, consultation with family doctors/GPs, hospital doctors or specialists, being diagnosed with chronic diseases, mental health conditions, or cancer). Statistical significance was set at $P < .05$. All statistical analyses were performed using IBM SPSS software (IBM SPSS Statistics for Windows, release 22.0; IBM Corp, Armonk, NY).

Results

Of the 9151 women who completed the questionnaire, 9049 provided data on cancer screening. Of these women, 65.1% had received a clinical skin examination and 54.3% had participated in colorectal cancer screening within the past 3 years. Within the past 2 years, 56.2% of women had undertaken a Pap test, 83.3% had a mammogram, and 55.8% had a clinical breast examination or had conducted breast self-examination.

Table 1 shows the associations between consulting a CM practitioner and cancer screening rates. Significant differences were found between women who did and did not visit a CM practitioner and participation in cancer screening. Women who consulted a naturopath/herbalist, massage therapist, chiropractor, osteopath, and acupuncturist were more likely to have a clinical skin examination ($P < .05$). Similarly, women who visited a naturopath/herbalist, massage therapist, osteopath, and acupuncturist were more likely to have a clinical breast examination ($P < .05$). Women who visited a chiropractor or an acupuncturist were more likely to participate in colorectal screening ($P < .05$). Women who had consulted a massage therapist or chiropractor were more likely to have a mammogram ($P < .05$); conversely, women who consulted a naturopath/herbalist, acupuncturist, or "other" alternative health practitioner in the last 12 months were less likely to have had a mammogram ($P < .05$).

The outputs from the adjusted logistic regression models are presented in Table 2. Women who had consulted a massage therapist were more likely to undergo a clinical skin examination (OR = 1.23; 95% CI = 0.98, 1.55; $P = .002$), clinical breast examination (OR = 1.15; 95% CI = 1.02, 1.29; $P = .018$), and mammogram (OR = 1.32; 95% CI = 1.12, 1.55; $P = .001$). Women who had consulted a chiropractor in the previous 12 months were more likely to undergo a clinical skin examination (OR = 1.28; 95% CI = 1.10, 1.49; $P = .001$), colorectal cancer screening (OR = 1.18; 95% CI = 1.03, 1.35; $P = .020$), and mammogram (OR=1.30; 95% CI = 1.06, 1.59; $P = .011$). Additionally, women who had consulted an acupuncturist were more likely to undergo colorectal cancer screening (OR = 1.29; 95% CI = 1.04, 1.61; $P = .019$), and those who consulted an osteopath were more likely to have a Pap test (OR = 1.27; 95% CI = 1.00, 1.62; $P = .049$).

Discussion

This study reports the relationship between CM practitioner consultation and participation in cancer screening in a large cohort of Australian women. Our analyses reveal several

Table 2. Output From the Logistic Regression Models Showing the Association Between Consulting Health Care Practitioners and Cancer Screening Behaviors, in 9151 Australian Women Aged 62 to 67 Years.

Dependent Variable	Independent Variable	Odds Ratio (95% Confidence Interval)	*P*
Clinical skin exam	Health care practitioner consulted		
	Naturopath/herbalist	1.23 (0.98, 1.55)	.071
	Massage therapist	1.22 (1.08, 1.39)	.002
	Chiropractor	1.28 (1.10, 1.49)	.001
	Osteopath	1.14 (0.88, 1.48)	.320
	Acupuncturist	1.09 (0.86, 1.39)	.458
	"Other" alternative health practitioner	1.05 (0.81, 1.38)	.699
Colorectal cancer screen	Health care practitioner consulted		
	Naturopath/herbalist	0.97 (0.79, 1.18)	.740
	Massage therapist	0.95 (0.85, 1.07)	.412
	Chiropractor	1.18 (1.03, 1.35)	.020
	Osteopath	0.97 (0.77, 1.23)	.815
	Acupuncturist	1.29 (1.04, 1.61)	.019
	"Other" alternative health practitioner	0.89 (0.70, 1.13)	.323
Pap test	Health care practitioner consulted		
	Naturopath/herbalist	1.15 (0.93, 1.41)	.191
	Massage therapist	0.98 (0.87, 1.10)	.749
	Chiropractor	1.13 (0.99, 1.30)	.076
	Osteopath	1.27 (1.00, 1.62)	.049
	Acupuncturist	1.01 (0.81, 1.26)	.921
	"Other" alternative health practitioner	1.12 (0.88, 1.43)	.371
Mammogram	Health care practitioner consulted		
	Naturopath/herbalist	0.78 (0.60, 1.01)	.057
	Massage therapist	1.32 (1.12, 1.55)	.001
	Chiropractor	1.30 (1.06, 1.59)	.011
	Osteopath	0.92 (0.67, 1.25)	.576
	Acupuncturist	0.81 (0.62, 1.07)	.145
	"Other" alternative health practitioner	0.88 (0.65, 1.19)	.408
Clinical breast exam	Health care practitioner consulted		
	Naturopath/herbalist	1.13 (0.92, 1.39)	.233
	Massage therapist	1.15 (1.02, 1.29)	.018
	Chiropractor	1.01 (0.88, 1.16)	.839
	Osteopath	1.11 (0.87, 1.41)	.404
	Acupuncturist	1.22 (0.98, 1.52)	.077
	"Other" alternative health practitioner	1.01 (0.79, 1.29)	.929
Breast self-exam	Health care practitioner consulted		
	Naturopath/herbalist	1.03 (0.85, 1.27)	.740
	Massage therapist	1.01 (0.90, 1.13)	.834
	Chiropractor	0.98 (0.85, 1.12)	.753
	Osteopath	1.03 (0.82, 1.30)	.783
	Acupuncturist	0.94 (0.76, 1.16)	.535
	"Other" alternative health practitioner	0.88 (0.70, 1.12)	.309

interesting findings. First, compared with women who did not consult a CM practitioner and women who consulted a CM practitioner had significantly higher rates of clinical skin examination and clinical breast examination.

Conversely, a US population study of more than 16 000 adults found the use of both conventional medical (defined as office-based GP services and outpatient hospital-based physician visits) and CM services negatively associated with clinical breast examination,[15] as compared with women who used conventional services only. Similarly, an Australian study found no relationship between CM product use and clinical breast examination; however, visits to CM practitioners were not evaluated[16] and associations remain unknown. Further detailed examination of cancer screening behavior of CM users, along with the preferences and cancer screening recommendations of CM practitioners is warranted to help ensure increased uptake of effective cancer screening strategies among women.

Women who consult CM practitioners may engage in proactive health behavior more frequently,[7] possibly including timely cancer screening practices. Research describes CM users as being proactive consumers who often have a holistic approach to health that involves active participation,[17] and they may equally participate in cancer screening as a proactive health measure. It is also possible that a CM practitioner may recommend cancer screening in line with the preventative health philosophy of their discipline.[18]

Risk perception has been found to be predictive of both preventative health behavior[19] and CM use.[20] A study involving breast cancer patients and their use and beliefs about CM found that women who used CM perceived the risk of cancer recurrence or death from cancer to be significantly greater than non-CM users.[20] As our study found an association between women who use CM and women who have clinical breast checks, these behaviors may both, at least in part, relate to concern about cancer occurrence or recurrence.

Increased health literacy may partly explain greater uptake of cancer screening initiatives by women who use CM in our study. CM users have frequently been found to have higher levels of education when compared with non-CM users.[10,21] This finding suggests that women who consult CM practitioners may have higher levels of health literacy (the degree to which individuals can obtain, process, and understand basic health information to make appropriate health decisions).[22] Increased health literacy may extend to a better understanding of the benefits and availability of various cancer screening initiatives. In line with this, a recent systematic review evaluating the impact of health literacy on the uptake of cancer screening found an association between inadequate health literacy and lower cancer screening rates.[22] Further research is required to understand the role and impact of health literacy on women's knowledge and consequent decisions about cancer screening.

The results for mammography from our study were slightly more nuanced than those reported for other breast cancer screening techniques. Women who had consulted a massage therapist or chiropractor in the previous 12 months were more likely to have had a mammogram and women who had consulted a naturopath/herbalist, acupuncturist, or "other" alternative health practitioner in the same period were less likely to have received a mammogram. Similarly, a US study found a positive association between massage therapy and mammogram screening, while women who consulted naturopaths were less likely to have a mammogram.[23] Downey et al[23] also investigated differences between alternative medicine (defined as using CM instead of conventional biomedical care) and complementary therapy (defined as using CM alongside conventional biomedical care). They found women who used CM as a complement to conventional care were more likely to have a mammogram as opposed to women who had not visited a doctor. Many women who use CM may be high health care consumers generally, including conventional care. There may also be important distinctions between different types of CM users that could be further elucidated in future research.

Inherent differences between CM disciplines such as massage therapy and naturopathy may also partly explain the differences in mammography uptake. For example, women who consult practitioners in disciplines defined by philosophy, as naturopathy and acupuncture often are, may prefer a less intrusive and more natural method of breast examination in line with the philosophical tenants of the discipline.[16] Furthermore, research shows that many women consult CM practitioners due to a desire for treatment they consider "safe," "holistic," and "natural."[7] The finding that women who seek care from naturopaths/herbalists and acupuncturists have a lower uptake of mammography may in some cases, be an extension of these beliefs and health seeking ideologies and a wish for a more noninvasive test.

Having confidence in nontraditional cancer treatments has previously been found to be a barrier to participation in mammography screening for minority women in the United States.[24] However, more research is required to determine if this barrier exists for Australian women who have not had a mammogram and who consult a naturopath/herbalist or acupuncturist. Conversations between CM practitioners and their female patients may also influence women's decision-making around participation in mammogram screening, and further research is required to understand the daily routine care approaches of CM practitioners regarding recommending cancer screening.

Our study also highlights that women are more likely to have a clinical skin examination if they consult with either a massage therapist or a chiropractor. As the type of treatment provided by these practitioners involves touch and an opportunity to view a person's skin, it is possible that massage therapists and chiropractors are opportunistically referring patients for screening if they identify a skin lesion of concern. This finding suggests that massage therapists and chiropractors may present a further clinical opportunity for the early diagnosis of skin lesions. Initiatives aimed at educating this workforce to identify suspicious lesions and

appropriate referral pathways may help to improve early skin cancer diagnosis and clinical outcomes.

Overall, rates for both breast and cervical screening were relatively low (approximately 50%) among our respondents. Even though rates were higher among those who consult CM practitioners, there may be an opportunity for CM practitioners to inquire about cancer screening as part of their routine care of female patients. The practice of asking patients about their cancer screening behavior may be particularly appropriate considering CM practitioners are commonly consulted by patients with chronic health conditions or other cancer risk factors.[25] The daily routine care approaches and behaviors of CM practitioners concerning cancer screening are currently undetermined. Research is warranted to identify education needs and address any challenges the CM workforce may have concerning cancer screening initiatives, to maximize the public health opportunities of this large practitioner group.

Limitations

The ALSWH is a comprehensive and well-respected source of epidemiological data, and a large number of participants and inclusion of the most important confounders within the regression models provide strength to the analyses reported here. There are, however, some limitations. The data collected were based on self-report and women may not have recalled all information correctly. We did not include conventional medical provider access and further study to examine relationships between conventional and CM provider utilization in relation to cancer screening would be valuable. Additionally, social desirability bias (respondents answer questions in a way they believe will please the researcher) cannot be ruled out. However, the opportunity to analyze CM consultation and cancer screening data from over 9000 women from a nationally representative survey, goes part way to countering these limitations.

Conclusion

There appear to be various associations between women's consultation with each of a range of CM practitioner types and cancer screening uptake, and in summary, women who visit CM practitioners are generally more likely to participate in cancer screening initiatives. Further research investigating the utilization and perception of cancer screening by women who consult CM practitioners is essential in understanding how patients navigate cancer screening, and why some choose certain screening tools while others do not engage in cancer screening at all. Research is also required to understand the current and potential role that CM practitioners (can) have as public health advocates, recommending preventative health measures such as cancer screening. Considering the substantial prevalence of CM use worldwide, rich analyses of the relationship between CM practitioner use and cancer screening choice will help ensure optimal uptake of cancer screening and effective, timely care for all cancer patients.

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