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Traditional and Complementary Medicine Practices and Supplementary Products among Breast Cancer Patients in Sarawak: Use and Reasons for Nonuse

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Abstract

Backgroud: Traditional and complementary medicine (T&CM) studies in breast cancer often combine heterogeneous practices and supplementary products, complicating interpretation of prevalence estimates. This study examined recent use of questionnaire-listed T&CM practices and supplementary products among breast cancer patients attending follow-up care in Sarawak, Malaysia, and explored variation in combined use across participant characteristics and reasons for no listed use. **Methods**: A cross-sectional questionnaire study was conducted among 431 adults attending breast cancer follow-up at Sarawak General Hospital from June 2023 to August 2024. Combined use was defined as reporting at least one listed T&CM practice or supplementary product during the preceding six months. Frequencies and percentages summarised reported practices, products, and reasons for no listed use. Pearson chi-square tests examined differences in combined-use status across participant characteristics. **Results**: Overall, 298 participants (69.1%) met the combined-use definition. However, only 51 participants (17.1% of combined users; 11.8% of the total sample) reported at least one listed traditional practice. Supplementary products predominated, especially fortified milk or colostrum (182/298, 61.1%) and vitamins or minerals (158/298, 53.0%). Combined-use status differed significantly by age group ($p = .033$), ethnicity ($p = .018$), residence ($p = .018$), and educational attainment ($p = .048$), but not household income, employment status, or cancer stage. Among 133 participants reporting no listed use, 99 (74.4%) had not considered T&CM. **Conclusion**: The high combined-use estimate was driven mainly by supplementary products rather than traditional therapeutic practices. Distinguishing practices from products provides a more meaningful account of patient behaviour and supports more precise, nonjudgmental oncology follow-up discussions. Future research should examine product formulation, dose, purpose, disclosure, expenditure, and timing in relation to cancer treatment within culturally diverse cancer care settings such as Sarawak.

Keywords: Breast Cancer, Traditional and Complementary Medicine, Supplementary Products, Dietary Supplements, Sarawak, Malaysia

Introduction

Breast cancer is a major and continuing public-health challenge worldwide and in Malaysia. An estimated 2.4 million women were diagnosed worldwide in 2024 and approximately 694,000 died from the disease (World Health Organization [WHO], 2026). In Malaysia, breast cancer is the most commonly diagnosed cancer among women; the national cancer registry reported that 50.5% of cases with recorded stage in 2017–2021 were diagnosed at stage III or IV (National Cancer Registry Department, 2024). Care extends beyond diagnosis and initial treatment to management of symptoms, nutrition, rehabilitation, and ongoing follow-up. During these phases, patients may also use traditional and complementary medicine (T&CM) practices or supplementary products. Understanding what they use is relevant to clinical conversations, but a general question about "T&CM use" may give little indication of the particular activity or product involved.

The distinction between practices and products is especially important. Massage, acupuncture, and other practices differ from orally consumed herbs, vitamins, probiotics, or fortified milk in how they are used and, in the questions, clinicians may need to ask. For example, some dietary supplements and herbal products could alter the effects of anticancer medicines, whereas a fortified milk product may be used principally for nutrition; neither purpose nor clinical risk can be established from a product name alone (National Cancer Institute, 2024). Malaysia's National Health and Morbidity Survey (NHMS) reports supplementary products separately from T&CM practices and does not automatically classify product use as a T&CM practice (Institute for Public Health, 2015). A survey that combines both in one measure can identify a broad range of reported use, but its overall percentage must not be interpreted as the prevalence of T&CM practices.

This measurement issue complicates comparisons between studies. A systematic review of research from Asian countries documented variation in reported T&CM use and disclosure among cancer patients across populations and survey methods (Choi et al., 2024). Estimates based on lifetime use, use before treatment, use during chemotherapy, or use over a defined recent period answer different question. The items included also matter counting prayer, herbal preparations, practitioner-delivered care, and nutritional products under a single label change who is classified as a user. Consequently, differences between published percentages cannot necessarily be attributed to differences in patients' behavior.

Malaysian breast cancer studies illustrate this problem. Saibul et al. (2012) reported CAM use among approximately 51% of survivors in selected regions of Peninsular Malaysia. In the MyBCC study, 34.8% of newly diagnosed patients reported CAM use before hospital treatment, with dietary supplements the most frequently reported category among users (Zulkipli et al., 2018). Among patients receiving chemotherapy, Chui et al. (2014) reported CAM use in 70.7%; the estimate fell to 66.1% when prayer for health was excluded. These studies document use at different points in the breast cancer pathway, but their populations, recall periods, and category definitions prevent direct comparison of the headline estimates. Reporting named practices and products alongside any combined measure would make their meaning clearer.

The point in the care pathway also matters clinically. In a study across six Malaysian public hospitals, including one in Sarawak, CAM use before initial breast cancer treatment was associated with delays in presentation and diagnosis after adjustment for measured characteristics (Mohd Mujar et al., 2017). The observational design does not establish that CAM caused those delays, and findings about use before treatment cannot describe what patients use during follow-up. The study nevertheless shows why the timing of use should be specified rather than treating CAM as a single behaviour that is constant across diagnosis, treatment, and subsequent care.

Research on patients' decisions adds another dimension. Interviews with Malaysian oncology patients identified varied reasons for selecting or rejecting CAM, including concerns about effectiveness, safety, and cost (Farooqui et al., 2012). A prospective study across Southeast Asian countries also linked spending on complementary medicine with adverse financial outcomes in some settings (Kong et al., 2022). These findings make it useful to distinguish a patient who has not considered a practice from one who considered it but declined it because of cost or other concerns. They do not, however, establish the reasons or financial consequences of use in the present clinic population. Moreover, a survey that asks about nonuse only among people reporting neither a listed practice nor a listed product cannot describe the reasons why *all* patients without T&CM practice use abstain.

Sarawak provides a distinct setting for examining these questions. Sarawak General Hospital serves patients from a geographically extensive and multiethnic state. A study at this central referral service identified unmet information and supportive-care needs among patients with various cancers (Lim et al., 2024). Research in Kuching primary-care clinics examined disclosure of T&CM use to doctors, but involved a different patient population (Johny et al., 2017). The earlier multicentre breast cancer study included Sarawak patients yet focused on use before initial treatment (Mohd Mujar et al., 2017). Together, these studies leave a narrower question unresolved: what questionnaire-listed practices and supplementary products were reported by breast cancer patients attending follow-up at the Sarawak referral centre, and what reasons were selected by attendees reporting no listed use?

This gap provides the motivation for the present study. A clearer understanding of recent T&CM practices and supplementary-product use during breast cancer follow-up is needed because broad prevalence estimates may obscure important differences between traditional therapeutic practices and products used for nutritional or other health-related purposes. Examining these behaviors within Sarawak's multiethnic and geographically diverse population may also provide context-specific evidence to support more precise and culturally appropriate communication during oncology follow-up.

We therefore examined self-reported use during the preceding six months among adults attending breast cancer follow-up at Sarawak General Hospital. Our objectives were to describe a combined measure of listed practice or supplementary product use; report listed traditional practices and supplementary product categories separately; explore unadjusted differences in combined use across participant characteristics; and describe reasons selected by participants reporting neither a listed practice nor a listed product. The principal contribution of this study is its explicit separation of traditional practices from supplementary products while retaining a clearly defined combined-use measure. By specifying the care

setting, recall period, categories, and denominators, the study offers a more interpretable account of use in this clinic. Its findings may help clinicians frame more specific, nonjudgmental follow-up questions and help researchers design studies that additionally measure purpose, formulation, dose, timing, disclosure, and cost. The study does not establish treatment effects, product safety, causal relationships, or prevalence among all people with breast cancer in Sarawak.

Methods

Study Design and Setting

We conducted a cross-sectional, interviewer-administered study among breast cancer survivors attending the Department of Radiotherapy, Oncology and Palliative Care at Sarawak General Hospital, Kuching, Sarawak, Malaysia. Participants were recruited during routine follow-up visits for conventional oncology care from June 2023 to August 2024. The clinic serves patients from Kuching and other parts of Sarawak, providing a clinical setting in which breast cancer survivors from different geographical areas of the state receive follow-up oncology care.

Data was collected through face-to-face interviews conducted in the patient waiting area before participants scheduled oncology consultations. Each participant was interviewed once. The study focused on self-reported traditional and complementary medicine (T&CM) practices and supplementary products used during the six months preceding the interview. The cross-sectional design was used to describe recent patterns of use and to examine variation in combined use across selected participant characteristics. The study design and reporting were guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations for cross-sectional studies (von Elm et al., 2007).

Participants, Recruitment and Sample-Size Determination

The study population comprised adults with breast cancer attending scheduled follow-up care at the study clinic during the recruitment period. Participants were eligible if they were aged 18 years or older and agreed to participate voluntarily after providing informed consent. Patients were excluded if they were younger than 18 years; belonged to a vulnerable group in which voluntary consent could be compromised, including prisoners; had a concomitant psychiatric illness, delirium, or impaired mental capacity that prevented adequate understanding of the study information and purpose; were experiencing severe pain that precluded voluntary informed consent; or were haemodynamically unstable or required resuscitation. Participants were recruited using a non-probability purposive sampling approach during their scheduled clinic attendance.

The minimum required sample size was estimated using a finite-population sample-size formula for categorical data. The calculation was based on a population of 2,036 breast cancer cases reported between 2018-2022, an assumed population proportion of 0.50, a 95% confidence level ($z = 1.96$), and a 5% margin of error. Applying these parameters yielded a minimum required sample size of 324 participants, based on the approach described by Sekaran and Bougie (2010). The final analytic sample comprised 431 participants, exceeding the calculated minimum requirement.

As an additional power consideration, a two-group comparison with at least 63 participants per group provides approximately 80% power to detect a medium effect size (d = 0.50) (Cohen, 2013). In the present study, 298 participants were classified as having combined use of at least one listed T&CM practice or supplementary product, while 133 reported no listed use; both groups therefore exceeded this minimum group size.

Study Instrument

Data were collected using a structured, interviewer-administered questionnaire available in English and Malay. The questionnaire captured sociodemographic and clinical characteristics, T&CM practices, complementary approaches, supplementary-product use, and reasons for no reported use. Questions on T&CM practices and supplementary products referred specifically to use during the six months preceding the interview, and participants were permitted to report more than one practice or product.

The questionnaire was developed with reference to the *National Health and Morbidity Survey 2015: Volume IV, Traditional and Complementary Medicine (T&CM)* (Institute for Public Health, 2015) and included named T&CM practices and supplementary-product categories to support systematic assessment. Participants could also report practices or products that were not included among the predefined response options. These additional responses were reviewed, cleaned, and classified into the most appropriate existing categories. Where a substantial number of responses could not be adequately accommodated within the predefined classification, additional categories were created to reflect recurring patterns in the reported data. The questionnaire content was reviewed by subject-matter experts, and English and Malay versions were prepared through a translation and review process to ensure consistency of meaning across both languages.

Before the main data collection, the questionnaire was piloted among 40 participants to assess clarity, comprehension, and feasibility of administration. The pilot findings were used to refine the instrument where necessary before full implementation. Participants involved in the pilot study were excluded from the final analytic sample.

Classification of T&CM Practices and Supplementary Products

The principal outcome was combined use, defined as self-reported use of at least one qualifying T&CM practice, complementary approach, or supplementary product during the six months preceding the interview. Participants reporting one or more qualifying practices or products were classified as combined users, whereas those reporting none were classified as having no listed use. For descriptive analyses, a participant reporting multiple practices or products could contribute to more than one individual category. The overall combined-use classification, however, counted each participant only once, irrespective of the number of practices or products reported.

Classification of traditional practices was informed by the Malaysian regulatory framework for T&CM. Under the Traditional and Complementary Medicine Act 2016 (Act 775) and the Traditional and Complementary Medicine (Recognized Practice Areas) Order 2017, seven practice areas are formally recognized in Malaysia: Traditional Malay Medicine, Traditional Chinese Medicine, Traditional Indian Medicine, Homeopathy, Chiropractic, Osteopathy, and Islamic Medical Practice (Institute for Public Health, 2015). Within the present study, reported

traditional practices included Malay massage, Malay cupping, Malay herbs, Islamic medical practices, Chinese herbs, Qi Gong, acupuncture, Tui Na, Chinese cupping, and yoga. Traditional-practice use was analyzed separately from supplementary-product use. Participants reporting more than one traditional practice contributed once to the overall traditional-practice count and separately to each specific practice reported.

Supplementary products were classified with reference to guidance from the Ministry of Health Malaysia and the Food-Drug Interphase (FDI) framework jointly applied by the National Pharmaceutical Regulatory Agency (NPRA) and the Food Safety and Quality Division (FSQD). The FDI framework distinguishes products regulated as drugs, including health supplements and natural products under the purview of the NPRA, from products regulated as foods under the FSQD. Classification is determined by factors including product composition, presentation, intended use, and medicinal or health claims. For the present analysis, supplementary products were organised into six descriptive categories: vitamins and minerals, herbs and botanicals, essential fatty acids, probiotics, fortified milk or colostrum, and manufactured dietary products.

Vitamins and minerals comprised self-reported single-nutrient and multinutrient preparations, including products containing vitamin C, vitamin D, calcium, zinc, or combinations of micronutrients. Essential fatty acids comprise lipid-based supplements such as fish oil, omega-3 preparations, and evening primrose oil. Probiotics included preparations containing bacterial or other microbial cultures consumed in capsule, powder, liquid, or similar forms. These categories correspond broadly to substances included within the NPRA definition of health supplements, which encompasses vitamins, minerals, fatty acids, probiotics, and other bioactive substances presented in dosage forms such as capsules, tablets, powders, and liquids. Registered health supplements in Malaysia are assigned an NPRA product registration number beginning with “MAL,” with the suffix “N” identifying the health-supplement category.

Herbs and botanicals comprised manufactured plant-based preparations as well as raw or traditionally prepared botanical remedies reported by participants for health or therapeutic purposes, including products such as Sabah snake grass and Black Face General leaves. This category was retained separately because botanical products may fall within different regulatory classifications depending on their composition, formulation, presentation, and claims under the Malaysian FDI framework.

Fortified milk or colostrum included commercial milk-based powder or liquid products enriched with nutrients, proteins, colostrum, or other added components and consumed as nutritional products. Manufactured dietary products comprised commercially processed nutritional preparations, including powdered meal-replacement products and specialised adult nutrition formulas. These categories were treated analytically as food-type nutritional products rather than pharmaceutical health supplements. This approach is consistent with the Malaysian regulatory distinction whereby foods, including products for special dietary use and foods containing permitted added nutrients, are regulated within the food regulatory framework administered by the FSQD under the Food Act 1983 and Food Regulations 1985.

Complementary massage was retained as a separate complementary approach and was distinguished from traditional Malay massage. Similarly, Chinese herbs and Malay herbs reported as components of traditional medical practice were retained within their respective traditional-practice categories, whereas botanical preparations reported primarily as consumed products were classified under herbs and botanicals. Additional practices and products reported outside the predefined questionnaire categories were reviewed and assigned to the most appropriate existing category. Where a substantial number of similar responses could not be adequately represented by the original classification, an additional category was created to capture the recurring pattern of use.

Sociodemographic, Clinical and Non-Use Variables

Age was recorded in completed years at the time of interview and categorised for analysis as <40, 40 to 49, 50 to 59, 60 to 69, and ≥70 years. Ethnicity was self-identified and classified as Chinese, Malay, or Sarawak Indigenous, while place of residence was categorised as Kuching or outside Kuching based on the participant's reported residential location. Educational attainment was grouped as below upper secondary education or upper secondary education and above, thereby providing a broad measure of formal educational level for comparison across combined-use groups.

Socioeconomic characteristics were assessed using household income and employment status. Monthly household income was categorised according to the Malaysian household-income classification adopted for the study, based on the Department of Statistics Malaysia Household Income Survey 2022. Participants were classified as B40, representing households with a monthly income of <RM4,850; M40, representing those with an income of RM4,850 to RM10,959; or T20, representing those with an income of >RM10,959 (Department of Statistics Malaysia, 2022). Employment status was determined from participants' self-reported employment profile and classified as currently employed or not currently employed. In addition, cancer stage was classified as early-stage disease, comprising stages 0 to II, or advanced-stage disease, comprising stages III to IV, with stage information obtained from medical records and participant reports.

Among participants who reported neither a qualifying T&CM practice nor a supplementary product during the preceding six months, reasons for no reported use were also assessed. These included not having considered T&CM, discouragement by family members, friends, or health professionals, doubts about methods lacking scientific evidence, inability to afford T&CM, satisfaction with conventional oncology care, and safety or clinical concerns. As participants could report more than one reason, each response category was counted independently to capture the range of considerations associated with no reported use.

Statistical Analysis

Participant characteristics were summarised descriptively using frequencies and percentages for categorical variables. Age was initially recorded in completed years and subsequently recoded into five categories for analysis: <40, 40 to 49, 50 to 59, 60 to 69, and ≥70 years. This categorisation was applied consistently in the descriptive and comparative analyses. The prevalence of combined use was calculated using the full analytic sample of 431 participants as the denominator, with participants classified according to whether they reported at least

one qualifying T&CM practice, complementary approach, or supplementary product during the preceding six months.

Traditional-practice use was summarised separately from complementary approaches and supplementary-product use to preserve the distinction between these forms of health-related behaviour. Percentages for individual traditional practices were calculated among the 51 participants who reported at least one traditional practice, whereas percentages for complementary approaches and supplementary products were calculated among the 298 participants classified as combined users. Reasons for no reported use were summarised among the 133 participants who reported neither a qualifying T&CM practice nor a supplementary product during the six-month recall period. Because participants could report more than one traditional practice, supplementary product, or reason for no use, these responses were treated as multiple-response data. Accordingly, individual categories were counted independently and percentages within these analyses were not expected to sum to 100%.

Associations between combined-use status and participant characteristics were examined using Pearson's chi-square (χ^2) test of independence. This test was appropriate because both combined-use status and the participant characteristics assessed were categorical variables (McHugh, 2013). The variables examined were age group, ethnicity, place of residence, educational attainment, household-income group, employment status, and cancer stage. Expected cell frequencies were assessed before interpretation, and all expected counts exceeded five, indicating that the assumptions for Pearson's chi-square test were satisfied and that neither category regrouping nor exact testing was required. For each comparison, the χ^2 statistic, degrees of freedom, and corresponding p value were reported. All tests were two-sided, with $p < .05$ considered statistically significant. The seven subgroup comparisons were exploratory and unadjusted, and exact p values were presented to support appropriate interpretation of the statistical evidence (Greenland et al., 2016). Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA).

Ethical Approval

The study received ethical approval from the Medical Research and Ethics Committee, Ministry of Health Malaysia (NMRR ID-23-00019-NHE), and institutional permission to conduct the study was obtained from Sarawak General Hospital. Before enrolment, eligible patients were provided with information about the study, including its purpose and procedures, and written informed consent was obtained from all participants prior to data collection. Participant confidentiality was maintained throughout the study. Completed questionnaires and electronic study data were stored securely, and access was restricted to authorised members of the research team.

Results and Discussion

Overall Pattern of Combined Use

As shown in Table 1, among the 431 participants, 298, or 69.1%, reported using at least one questionnaire-listed traditional and complementary medicine practice or supplementary product during the preceding six months. The remaining 133 participants, or 30.9%, reported no listed use. This overall proportion requires careful interpretation because the operational definition of combined use included both traditional and complementary medicine practices

and supplementary products. The 69.1% estimate therefore represents a broad measure of recent practice or product use rather than the prevalence of traditional and complementary medicine practice alone.

This distinction is particularly important when the present findings are compared with earlier Malaysian studies. Saibul et al. (2012) reported complementary and alternative medicine use among approximately 51% of breast cancer survivors, while Zulkipli et al. (2018) reported 34.8% among newly diagnosed breast cancer patients before hospital treatment. Chui et al. (2014) reported a prevalence of 70.7% among women receiving chemotherapy, which decreased to 66.1% when prayer for health was excluded. Although the present combined-use estimate of 69.1% appears close to that reported by Chui et al. (2014),
the numerical similarity should not be interpreted as evidence of equivalent patterns of use.

Table 1
Participant Characteristics by Combined Use of Listed Practices or Products in The Preceding Six Months

Characteristic	**All N = 431**	**Combined Users n = 298**	**No listed use n = 133**	**χ^2 (df)**	**p**
Age group				**10.459 (4)**	**.033**
<40 years	30 (7.0)	16 (5.4)	14 (10.5)		
40–49 years	103 (23.9)	62 (20.8)	41 (30.8)		
50–59 years	135 (31.3)	100 (33.6)	35 (26.3)		
60–69 years	126 (29.2)	93 (31.2)	33 (24.8)		
≥70 years	37 (8.6)	27 (9.1)	10 (7.5)		
Ethnicity				**8.005 (2)**	**.018**
Chinese	162 (37.6)	123 (41.3)	39 (29.3)		
Malay	132 (30.6)	80 (26.8)	52 (39.1)		
Sarawak Indigenous	137 (31.8)	95 (31.9)	42 (31.6)		
Residence				**5.554 (1)**	**.018**
Kuching	275 (63.8)	201 (67.4)	74 (55.6)		
Outside Kuching	156 (36.2)	97 (32.6)	59 (44.4)		
Education				**3.922 (1)**	**.048**
Below upper secondary	193 (44.8)	124 (41.6)	69 (51.9)		
Upper secondary or above	238 (55.2)	174 (58.4)	64 (48.1)		
Household income				**2.776 (2)**	**.250**
B40	314 (72.9)	210 (70.5)	104 (78.2)		
M40	97 (22.5)	73 (24.5)	24 (18.0)		
T20	20 (4.6)	15 (5.0)	5 (3.8)		
Employment				**1.143 (1)**	**.285**
Currently employed	142 (32.9)	103 (34.6)	39 (29.3)		
Not currently employed	289 (67.1)	195 (65.4)	94 (70.7)		
Cancer stage				**0.026 (1)**	**.872**
Early (0–II)	252 (58.5)	175 (58.7)	77 (57.9)		
Advanced (III–IV)	179 (41.5)	123 (41.3)	56 (42.1)		

Note. Values are n (column %). Combined use includes at least one listed T&CM practice or supplementary product. T&CM, traditional and complementary medicine; B40, bottom 40%

household-income group; M40, middle 40%; T20, top 20%. Pearson chi-square p-values are exploratory and unadjusted.

The studies differed in the populations examined, stage of the cancer-care pathway, recall periods, and modalities included in the definition of complementary medicine. Zulkipli et al. (2018), for example, examined use before hospital treatment among newly diagnosed patients, whereas the present study assessed behaviors reported during a six-month period among patients attending follow-up care. Chui et al. (2014) examined patients receiving chemotherapy and included prayer within the initial complementary and alternative medicine definition. Such methodological differences can materially influence reported prevalence estimates. Choi et al. (2024) similarly identified considerable heterogeneity in definitions and measurement approaches across studies of complementary medicine use among cancer populations in Asia.

The present findings therefore reinforce the importance of interpreting prevalence according to the underlying operational definition. A high combined-use percentage does not necessarily indicate widespread engagement with traditional therapeutic practices. This becomes particularly evident when the component categories in the present study are examined separately.

Traditional Practices and Supplementary Products

As shown in Table 2, among the 298 participants classified as combined users, supplementary products were reported substantially more frequently than traditional practices. Fortified milk or colostrum was reported by 182 participants (61.1% of combined users), while 158 (53.0%) reported vitamins or minerals. Herbs and botanicals were reported by 46 participants (15.4%), essential fatty acids by 41 (13.8%), manufactured dietary products by 15 (5.0%), and probiotics by 13 (4.4%). By comparison, 51 combined users (17.1%) reported at least one of the listed traditional practices, corresponding to 11.8% of the total study sample.

Table 2

Complementary Approaches and Supplementary Products Among Participants with Combined Use

Approach or product	**n**	**% of 298**
Complementary massage	5	1.7
Vitamins and minerals	158	53.0
Herbs and botanicals	46	15.4
Essential fatty acids	41	13.8
Manufactured dietary products	15	5.0
Fortified milk or colostrum	182	61.1
Probiotics	13	4.4

Note. The denominator is 298 participants with combined use. Multiple responses were allowed; percentages need not total 100%.

This marked predominance of supplementary-product use is important for interpreting the overall combined-use estimate of 69.1%. When expressed relative to the total study sample, fortified milk or colostrum was reported by 42.2% of participants and vitamins or minerals by 36.7%, both substantially exceeding the 11.8% who reported at least one listed traditional practice. The overall combined-use estimate therefore appears to have been driven

predominantly by the inclusion of supplementary products rather than by widespread use of traditional therapeutic practices. This distinction is important because combining supplementary products and traditional practices within a single measure may mask meaningful differences in the nature, purpose, and context of these health-related behaviors.

The need to distinguish between these categories is consistent with the approach adopted in the Malaysian National Health and Morbidity Survey, which reports supplementary-product use separately from traditional and complementary medicine practices rather than automatically classifying all supplementary products as traditional medicine (Institute for Public Health, 2015). Maintaining this distinction is particularly relevant when comparing prevalence estimates across studies, as differences in the operational definition of traditional and complementary medicine may substantially influence the reported magnitude of use.

The high frequencies of fortified milk or colostrum and vitamins or minerals are also consistent with previous Malaysian research demonstrating the substantial contribution of dietary and supplementary products to estimates of complementary medicine use. Zulkipli et al. (2018) identified dietary supplements as the most frequently reported complementary medicine category among users in the MyBCC study. The present findings extend this observation to the follow-up setting in Sarawak, where commonly consumed supplementary products similarly accounted for a substantial proportion of the broader combined-use measure.

Table 3
Traditional practices among traditional-practice users

Practice	**n**	**% of 51**
Chinese herbs	8	15.7
Qi Gong	5	9.8
Acupuncture	4	7.8
Tui Na	2	3.9
Chinese cupping	1	2.0
Malay herbs	1	2.0
Malay cupping	4	7.8
Malay massage	16	31.4
Yoga	2	3.9
Islamic medical practices	15	29.4

Note. Fifty-one of the 298 participants with combined use reported a listed traditional practice. Multiple responses were allowed; percentages use 51 as the denominator.

As presented in Table 3, although traditional practices were less frequently reported overall, their distribution was diverse. Among the 51 participants who reported at least one traditional practice, Malay massage was the most frequently reported, with 16 participants (31.4%), followed closely by Islamic medical practices, reported by 15 participants (29.4%). Chinese herbs were reported by eight participants (15.7%) and Qi Gong by five (9.8%). Acupuncture and Malay cupping were each reported by four participants (7.8%), while Tui Na and yoga were each reported by two participants (3.9%). Chinese cupping and Malay herbs were the least frequently reported practices, with one participant each (2.0%).

Therefore, these findings demonstrate considerable heterogeneity within the relatively small subgroup reporting traditional practices. Malay massage and Islamic medical practices accounted for the largest proportions, whereas the remaining modalities were reported far less frequently. More broadly, the contrasting patterns observed between supplementary-product use and traditional therapeutic practices suggest that traditional and complementary medicine should not be interpreted as a single homogeneous behavioural category. Distinguishing these components is therefore important for producing more clinically meaningful prevalence estimates and for accurately characterising patterns of complementary healthcare use.

Variation in Combined Use According to Participant Characteristics

Combined-use status varied significantly according to age, ethnicity, residence, and educational attainment, whereas no statistically significant differences were observed according to household income, employment status, or cancer stage (Table 1). These findings indicate that reported combined use was patterned by selected demographic characteristics within the study sample, although the strength and nature of these associations differed across variables.

Combined-use status differed significantly across age groups, χ^2 (4) = 10.459, p = .033. Combined use was reported by 53.3% of participants younger than 40 years, 60.2% of those aged 40 to 49 years, 74.1% of those aged 50 to 59 years, 73.8% of those aged 60 to 69 years, and 73.0% of those aged 70 years or older. The distribution suggests that the principal age-related difference occurred between participants younger than 50 years and those aged 50 years or older, rather than reflecting a progressive increase across successive age groups. Intuitively, the pattern indicates that combined use became more common from middle adulthood onwards and remained relatively stable across the older age groups. This may reflect age-related differences in health-seeking behaviour, accumulated experience with health management, or greater engagement with products and practices intended to support health and well-being.

Ethnicity was also associated with combined-use status, $\chi^2(2) = 8.005$, p = .018. Combined use was reported by 123 of 162 Chinese participants, or 75.9%, compared with 95 of 137 Sarawak Indigenous participants, or 69.3%, and 80 of 132 Malay participants, or 60.6%. These within-group proportions demonstrate heterogeneity in combined use across the three ethnic categories represented in the study. In the multiethnic context of Sarawak, such variation may reflect differences in cultural familiarity, social context, exposure to health information, or availability of particular products and practices. Furthermore, ethnicity was analysed in relation to the overall combined-use measure rather than to specific modalities. The findings therefore do not establish that any ethnic group preferentially used a particular traditional practice or supplementary product.

Residence showed a similar pattern. Combined use was reported by 201 of 275 participants residing in Kuching, or 73.1%, compared with 97 of 156 participants residing outside Kuching, or 62.2%, and the difference was statistically significant, χ^2 (1) = 5.554, p = .018. The approximately 11 percentage point difference suggests geographical variation in reported use. One possible explanation is that residence captures differences in access to commercial health products, complementary health services, healthcare information, or retail availability.

This interpretation is plausible given the predominance of supplementary products within the combined-use measure, although access itself was not directly assessed. Residence may also encompass differences in travel patterns, socioeconomic circumstances, healthcare exposure, and social networks. Hence, the observed pattern, to certain extent, suggests that place of residence may represent an important contextual dimension of how patients access and engage with supplementary products and complementary health practices in Sarawak.

Educational attainment was also associated with combined-use status, χ^2 (1) = 3.922, p = .048. Among participants with upper secondary education or above, 174 of 238, or 73.1%, reported combined use, compared with 124 of 193 participants, or 64.2%, among those with education below upper secondary level. The higher proportion among participants with greater educational attainment indicates that combined use occurred across educational levels but was more frequently reported among those with upper secondary education or above. This pattern may reflect broader engagement with health information, greater familiarity with available health products, and a more active role in personal health management among participants with higher educational attainment. The finding also suggests that engagement with T&CM practices and supplementary products is not confined to participants with lower educational backgrounds but forms part of health-related decision-making across different levels of formal education.

In contrast, household income was not significantly associated with combined use, p = .250. This finding indicates that variation in combined use was not clearly differentiated across the household-income categories examined in this sample. The absence of a statistically significant relationship is noteworthy because many supplementary products involve recurring personal expenditure. However, income and affordability are not equivalent constructs. Decisions regarding product use may depend on perceived necessity, household spending priorities, financial support, product price, and other circumstances that are not fully represented by broad income categories. This distinction is consistent with the separate finding that affordability was reported by some participants with no listed use.

Employment status was likewise not significantly associated with combined-use status, p = .285. Employment may overlap with age, retirement, household income, caregiving responsibilities, and other socioeconomic characteristics. Accordingly, the absence of a statistically significant bivariate association does not indicate that socioeconomic circumstances are unrelated to decisions concerning supplementary products or traditional practices. Rather, employment status alone did not differentiate combined use within the present sample.

Cancer stage showed the least variation. Combined use was reported by 175 of 252 participants with stage 0 to II disease, or 69.4%, and by 123 of 179 participants with stage III to IV disease, or 68.7%. The difference was less than one percentage point and was not statistically significant, p = .872. This near-identical distribution suggests that combined use was not concentrated among participants with more advanced disease. In the present sample, having stage III to IV disease was not associated with a higher prevalence of combined use than having stage 0 to II disease. This finding is noteworthy because complementary medicine is sometimes discussed in relation to greater disease severity or treatment burden. The present data do not show such a pattern when disease stage is classified broadly as early

or advanced. Instead, the similarity between the two stage groups suggests that engagement with T&CM practices or supplementary products occurred across the disease-stage spectrum represented in this cohort and was not confined to participants with more advanced cancer.

All in all, the participant-characteristic findings show that combined use varied according to age, ethnicity, residence, and educational attainment, but not according to household income, employment status, or cancer stage. The overall pattern suggests that engagement with T&CM practices and supplementary products was more strongly differentiated by selected demographic and contextual characteristics, while remaining broadly distributed across socioeconomic and disease-stage groups. This combination of variation and similarity highlights the diverse profile of combined use among breast cancer patients receiving conventional oncology care at Sarawak's main public referral centre.

Reasons among Participants Reporting No Listed Use

Table 4 shows that among the 133 participants who reported neither practicing traditional medicine or therapy nor consuming supplementary products during the preceding six months, the most frequently reported reason was that they had not considered traditional and complementary medicine, as reported by 99 participants (74.4%). This suggests that non-use was most commonly characterized by a lack of consideration rather than an explicit rejection of complementary approaches. Interpersonal influence was also evident, with 41 participants (30.8%) reporting discouragement from family, friends, or health professionals. Concerns regarding scientific evidence were reported by 36 participants (27.1%), indicating that perceived evidential support was an important consideration for a substantial subgroup. Similar factors have been identified in Malaysian oncology research, where perceptions of effectiveness and safety were found to influence decisions regarding complementary and alternative medicine use (Farooqui et al., 2012).

Affordability was reported by 33 participants (24.8%), highlighting the role of financial considerations alongside therapeutic and social factors. This finding is consistent with broader Southeast Asian evidence indicating that expenditure on complementary medicine may contribute to the financial burden experienced by patients with cancer (Kong et al., 2022). Satisfaction with conventional oncology care was reported by 19 participants (14.3%), while safety or clinical concerns were reported by eight participants (6.0%). Overall, the pattern indicates that participants reporting no listed use were influenced by a range of factors, with non-consideration predominating, followed by interpersonal discouragement, concerns regarding scientific evidence, affordability, satisfaction with conventional care, and safety considerations. These findings highlight the diverse considerations shaping decisions about traditional and complementary medicine among participants who reported no listed use.

Table 4
Reasons Reported by Participants with No Listed Use In The Preceding Six Months

Reason	n	% of 133
Had not considered T&CM	99	74.4
Discouraged by family, friends or health professionals	41	30.8
Doubted methods without scientific evidence	36	27.1
Could not afford T&CM	33	24.8
Satisfied with conventional oncology care	19	14.3
Safety or clinical concerns	8	6

Note. The denominator is 133 participants with no listed use. More than one reason could be selected, so percentages need not total 100%. The response options retain the questionnaire's T&CM wording.

Implications and Recommendations

The interpretation of the findings points to the need for a more precise way of conceptualising T&CM and supplementary-product use within breast cancer care. The broad category of combined use captures behaviours that differ substantially in purpose, mode of use, cultural meaning, and clinical relevance. In particular, supplementary products appear to occupy a prominent place in patients' health-related decision-making during follow-up, while traditional practices form a smaller and more distinct component. This distinction has important consequences for how oncology care teams discuss these behaviours with patients. Rather than approaching T&CM as a single category, clinical enquiry should distinguish orally consumed products from practitioner-delivered, physical, spiritual, or culturally grounded practices. This would allow oncologists, nurses, pharmacists, dietitians, rehabilitation professionals, and other members of the care team to respond to the specific form of use being reported rather than relying on a general label. Such an approach is consistent with the Malaysian National Health and Morbidity Survey, which treats supplementary products and T&CM practices as conceptually distinct categories (Institute for Public Health, 2015). It would also align clinical conversations more closely with the types of products and practices that patients actually incorporate into their care.

The prominence of orally consumed products has particular implications for medication reconciliation and nutritional assessment. Products such as vitamins, minerals, herbal preparations, botanicals, essential fatty acids, probiotics, fortified milk, and colostrum may be perceived by patients as food, nutrition, or general health support rather than as medicines. As a result, a routine question about traditional medicine may not elicit complete information about what patients are consuming. A more useful approach would be to ask directly about specific categories of products and then document the product name, ingredients, dose, frequency, duration, reason for use, and timing in relation to prescribed cancer treatment. Oncology pharmacists can contribute by reviewing the pharmacological relevance of identified products, while dietitians can assess whether nutritional products fit appropriately within the patient's dietary needs and overall nutritional status. This is particularly important because some dietary supplements and herbal products can alter the absorption, metabolism, or effects of anticancer medicines (National Cancer Institute, 2024). The appropriate response is therefore not to treat all supplementary products as inherently problematic, but to ensure that sufficiently detailed information is available for informed

clinical assessment. Integrating this information into routine medication and nutrition review would make supplementary-product use more visible within conventional oncology care.

The observed demographic and contextual patterning of combined use also suggest that communication about T&CM and supplementary products should be responsive to the diversity of patients receiving breast cancer care in Sarawak. Differences associated with age, ethnicity, residence, and education indicate that health-related choices are shaped within different social, cultural, and informational environments. This does not imply that specific products or practices should be assumed on the basis of a patient's background. Instead, it supports communication that is flexible enough to acknowledge different cultural traditions, levels of familiarity with health products, and patterns of information seeking. Clinicians can therefore use culturally respectful examples and open-ended questions while allowing patients to describe their own practices in their own terms. In a multiethnic setting such as Sarawak, this approach is especially relevant because traditional practices may carry meanings that extend beyond symptom management and include family, cultural, spiritual, or community dimensions. Previous research in Kuching has also highlighted the importance of disclosure and clinician communication in relation to T&CM use (Johny et al., 2017). A communication style that is specific, neutral, and nonjudgmental may therefore strengthen both the accuracy of clinical information and the quality of the therapeutic relationship.

The interpretation of the responses among participants with no reported use further suggests that communication should not be organised around a simple user and nonuser distinction. Patients who do not report T&CM or supplementary-product use may differ substantially in whether they have considered such options, how they view scientific evidence, whether they have been influenced by family or health professionals, and whether affordability affects their decisions. This diversity has implications for how health information is provided. Rather than relying on messages that simply encourage or discourage T&CM, healthcare professionals should provide balanced information that helps patients understand the potential purpose, evidence base, safety considerations, and costs of different products and practices. Patients who are considering a new product or traditional approach should be encouraged to discuss it with their oncology team before use, while those who are already using such approaches should be invited to disclose them without fear of criticism. Family members may also be involved in these conversations when appropriate because decisions about traditional practices and supplementary products may be influenced by household members and wider social networks. This is particularly relevant in cancer care, where family members often participate in treatment decisions, caregiving, transport, product purchasing, and everyday management of symptoms and nutrition.

The geographical pattern in the findings also has implications for how information and supportive care are organised across Sarawak. Breast cancer patients who receive follow-up at the state's main public referral centre come from both Kuching and areas outside the capital, and their opportunities to access health information, products, practitioners, and specialist advice may differ. This supports the development of consistent educational materials that can be used not only at the central oncology service but also across other points of the referral and follow-up pathway. Information should clearly distinguish traditional practices, herbal and botanical products, nutritional supplements, and other commercially available products so that patients can understand why different forms of use may require

different types of discussion with healthcare professionals. Materials should also be written in accessible language and, where feasible, be adapted for the linguistic and cultural diversity of Sarawak. Lim et al. (2024) previously identified unmet information and supportive-care needs among cancer patients attending the central referral service in Sarawak. Integrating T&CM and supplementary-product information into broader supportive-care education would therefore complement existing efforts to improve the continuity and relevance of cancer information across the care pathway.

Furthermore, the findings relating to affordability indicate that the economic dimension of supplementary-product and T&CM use deserves greater attention within supportive cancer care. The cost of these products and services may become recurrent, particularly when patients use them over extended periods of treatment and follow-up. For patients already managing transport, accommodation, medications, caregiving, and other cancer-related expenses, additional spending on supplementary products may represent an important household consideration. Previous research in Southeast Asian middle-income countries has shown that out-of-pocket expenditure on complementary medicine can contribute to adverse financial outcomes among people with cancer (Kong et al., 2022). This suggests that discussions about supplementary products should include not only questions about potential benefit and safety but also whether the cost is sustainable and whether the product is being prioritised over other essential aspects of care. Financial counselling, social-work support, and dietetic advice may therefore be particularly valuable when patients are purchasing expensive nutritional or complementary products on a recurring basis. Such discussions should remain patient centred and should focus on helping patients make informed choices that take account of both expected benefit and financial burden.

At the service and policy level, the findings support more standardised documentation of T&CM practices and supplementary-product use within oncology follow-up. Clinical records could include separate fields for orally consumed products and non-product practices, together with information on purpose, dose or frequency, duration, and source of recommendation. This would make relevant information easier to review across repeated visits and across different members of the multidisciplinary team. Professional education for oncology staff could also include guidance on how to ask about these behaviours using neutral and culturally respectful language. At a broader policy level, consistent terminology across clinical practice, patient education, public health communication, and research would reduce ambiguity around what is meant by T&CM use. The distinction between supplementary products and traditional practices is particularly important because combining them under a single prevalence estimate can obscure meaningful differences in patient behaviour. Clearer classification would therefore improve both communication and interpretation across healthcare services.

The findings also provide a basis for refining future research on T&CM and supplementary-product use in oncology. Studies would benefit from moving beyond a simple binary measure of use and describing the specific product or practice, intended purpose, source of recommendation, frequency, duration, expenditure, and relationship with conventional treatment. Greater attention to these dimensions would allow researchers to distinguish nutritional supplementation, symptom-management practices, culturally meaningful traditional approaches, and products used with therapeutic intent. It would also enable more

meaningful comparisons across studies because prevalence estimates could be interpreted in relation to clearly defined categories and recall periods. The demographic patterns observed in Sarawak additionally suggest value in examining how age, education, cultural context, place of residence, access to health information, and social influence shape patients' choices. Future work that integrates these behavioural and contextual dimensions could provide a more complete understanding of how T&CM and supplementary products fit within the broader experience of breast cancer care.

By and large, the implications of this study extend beyond determining how many patients use T&CM or supplementary products. The more important issue is how these behaviours are understood, communicated, documented, and incorporated into conventional oncology care. The findings support a shift from broad classification toward more specific and patient-centred enquiry that recognises the differences among nutritional products, herbal preparations, traditional practices, and other complementary approaches. For clinical teams, this means asking more precise questions and incorporating the answers into medication, nutritional, and supportive-care assessment. For healthcare services, it means providing consistent documentation and accessible information across the referral pathway. For patients and families, it means creating an environment in which these choices can be discussed openly and evaluated alongside conventional treatment. For researchers and policymakers, it means using clearer definitions and generating evidence that reflects the diversity of behaviours currently grouped under the broad concept of T&CM. Taken together, these recommendations provide a practical pathway for ensuring that traditional practices and supplementary products are considered as part of the wider breast cancer care experience in Sarawak rather than as activities occurring separately from conventional oncology care.

Conclusion

This study provides a more differentiated and contextually grounded understanding of T&CM practices and supplementary-product use among breast cancer patients receiving follow-up care at Sarawak's main public oncology referral center. The central finding is that the high level of combined use was driven predominantly by supplementary products rather than by traditional therapeutic practices. This distinction is important because it changes how the overall prevalence should be interpreted and reinforces the need to separate practices from products when describing patient behaviour. The prominence of fortified milk or colostrum and vitamins or minerals further shows that many health-related choices made alongside conventional oncology care may fall outside what patients or clinicians ordinarily recognise as T&CM. Combined use also varied according to age, ethnicity, residence, and educational attainment, while remaining broadly distributed across household-income, employment, and disease-stage groups. Among participants reporting no listed use, the predominance of having not considered T&CM further indicates that absence of use is not synonymous with deliberate rejection. On the whole, these findings challenge the usefulness of treating T&CM as a single homogeneous category and support a more differentiated understanding of how traditional practices and supplementary products coexist with conventional breast cancer care.

The findings should nevertheless be interpreted in light of the cross-sectional design, purposive recruitment from a single tertiary referral centre, and reliance on self-reported use

during the preceding six months. The broad combined-use definition also grouped together behaviours that differ substantially in purpose, route of use, cultural meaning, and potential clinical relevance. In addition, the study did not capture detailed information on product formulation, dose, frequency, duration, intended purpose, source of recommendation, expenditure, disclosure to the oncology team, or timing in relation to cancer treatment. These considerations limit the extent to which the motivations, clinical significance, and consequences of specific products and practices can be determined from the present findings.

Future research should examine T&CM practices and supplementary products in greater detail across different stages of the breast cancer care pathway. Multicentre and longitudinal studies, together with multivariable analyses, would help clarify how demographic, clinical, cultural, informational, and socioeconomic factors shape patterns of use. Greater attention should also be given to patients' motivations, sources of advice, disclosure behaviour, expenditure, and the clinical relevance of specific products used alongside conventional treatment. Such evidence would move the field beyond broad prevalence estimates toward a clearer understanding of what patients use, why they use it, and how these choices intersect with oncology care. This deeper understanding is essential for developing more precise, culturally responsive, and patient-centred breast cancer care in Sarawak and comparable settings.

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