



Popularity of Traditional Chinese Medicine Use Among Breast Cancer Patients in North China: A Cross-Sectional Study

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Background: The role of traditional Chinese medicine (TCM) in breast cancer treatment is controversial. The aim of this study is to explore the popularity of TCM among the breast cancer patients who have been treated with Western medicine (WM) in north China.

Methods: An observational, cross-sectional study was conducted. We consecutively recruited 691 breast cancer patients who were diagnosed in Shanxi Bethune Hospital between 1 January 2017 and 31 December 2020 and completed follow-up between June and August 2022. A self-designed questionnaire was used for data collection. Participants were asked about TCM use by phone. Univariate and multivariate analyses were performed as appropriate.

Results: At median follow-up of 41 months (range, 17–61 months), 326 (47.2%) participants used TCM. The results of multivariate logistic regression showed that residential area, education, annual income per capita, experienced TCM treatment before, stage of diagnosis, and trust in TCM were independent predictors of TCM use. The detail of TCM use and the reason for non-TCM use were presented comprehensively.

Conclusion: The use of TCM was prevalent among breast cancer patients treated with WM in north China. If WM physician encourage the patients with higher intention to use TCM and provide them with appropriate advices, the quality of life of patients will be further improved through integrating TCM into standard adjuvant therapy.

Keywords: traditional Chinese medicine, breast cancer, cross-sectional study, China

Background

Traditional Chinese medicine dates back thousands of years. It is based on the yin–yang theory and the five elements theory, with a holistic, traditional system, and has developed from practical life of the Chinese nation.¹ TCM has its special cultural style and enriched experience.² With thousands of years of development, TCM is recognized for various diagnostic and treatment advantages for various diseases. Until the end of the nineteenth century, TCM was the only healthcare security choice for the Chinese.¹ Interestingly, most Chinese doctors have only undergraduate training in Western medicine.³ This has led to Western medicine currently dominating the treatment of carcinoma in China, especially in general hospitals based on Western medicine.

Breast cancer has become the most prevalent malignant tumor globally, including in China, with the highest incidence rate.⁴ Progress has been achieved in treating breast cancer in the Western medicine system, with significant effects and good prognoses.^{5,6} Research on the occurrence and development of breast cancer has been performed at the genetic and signaling levels. The major means of breast cancer treatment include surgery, radiation, chemotherapy, targeted therapies, endocrine treatment, and immunotherapy.⁷ From the TCM point of view, Qi stagnation and blood stasis are the two main

causes of breast cancer. Blood stasis syndrome affects most tumor patients to varying degrees. A person with breast cancer has poor emotions and stagnating liver Qi, resulting in poor blood circulation and an illness affecting the collaterals, thereby leading to blood stasis symptoms.⁸ Traditional Chinese medicine (TCM) treatment of breast cancer emphasizes a holistic approach and individualized care. Western medicine, on the other hand, possesses more advanced technology and evidence-based support in the treatment of breast cancer. In recent years, scholars have conducted research on the pathophysiological mechanisms of TCM in cancer treatment and have made some progress.⁹ Although traditional Chinese medicine and Western medicine hold different therapeutic concepts, each has its own characteristic advantages.

According to a national survey conducted in China, there were 1,030,935 health institutions in 2021, of which 77,336 were TCM-specialized health institutions, including 5715 TCM hospitals, 71,583 outpatient departments/clinics, and 38 research institutes. TCM health practitioners reached 884,000, and the total number of visits for a TCM diagnosis and treatment reached 1.2 billion.³ In other words, it is easy for the Chinese to access TCM services in China.

For breast cancer survivors treated with Western medicine treatment, what is their attitude toward TCM? Have they ever sought help from TCM treatment? Did TCM address their matter? Therefore, we carried out this study to address these questions.

Method

Study Population

With Institutional Review Board approval, we identified all breast cancer patients who were diagnosed pathologically for the first time at Shanxi Bethune Hospital between 1 January 2017 and 31 December 2020 (all patients are of Han nationality). Shanxi Bethune Hospital is a university teaching hospital with a TCM department; WM is the main type of service available. No cooperation has been established between our treating team and TCM since our department was established, nor have we incorporated TCM into the breast cancer diagnosis and treatment plan.

The patients described above constituted the subjects of our investigation based on the following two reasons. First, our team members were trained uniformly at the end of 2016, and the use of TCM is neither encouraged nor discouraged during and after the end of treatment. That is to say, our team had a neutral attitude toward TCM. Second, a Chinese patent medicine, ie, Huaier Granules, was recommended for breast cancer patients with triple-negative subtype from the time of six months within the end of treatment since April 2022. The patients whom we investigated received neutral recommendations about TCM.

Patients who had passed away or been lost to follow-up at the time of the survey were excluded.

Data Collection

An internal database and an electronic medical record system were used to collect the disease-related information. Other patient information was obtained by telephone follow-up using a self-designed questionnaire.

Once oral consent had been provided by the patients, an electronic informed consent form was sent to them via WeChat, and the participants provided an electronic signature. After that, the data were collected immediately via telephone.

We implemented a three-stage design in this study. First (stage I), four investigators (ie, GJN, ZR, ZJY and GQX) independently reviewed the literature and jointly created the survey questionnaire.

In the second stage (stage II), three investigators (ie, ZR, ZJY and GQX) followed up with five patients and explained the study to them via telephone, respectively. The requirement was that at least four participants would answer all the questions in the questionnaire. The investigation was followed by a new round of discussion, adjusting the questionnaire content and structure. The data on the questionnaire were entered into EpiData Manager (version 4.0.2.101), and a double-entry system was employed in the data entry process.

In the third stage (stage III), three investigators (ie, ZR, ZJY and GQX) followed up with all other patients who met the aforementioned criteria. All investigators maintained a neutral demeanor throughout the investigation.

Demographic data, socioeconomic data, and TCM usage were requested, and the patients had the right to refuse to answer any questions that were uncomfortable. The questionnaire was considered valid if the question “has ever used TCM or not” was answered. The patients were further contacted for disease-related information verification to guarantee the accuracy of the data entry.

The Questionnaire

The questionnaire consisted of five parts. The first part was for sociodemographic information, such as age, education, place of residence, occupation, and income. The second part contained disease-related information: the date of initial diagnosis, the time to the end of treatment, pathological types, tumor stage (stage of the disease at the diagnosis), as well as treatment information. The third part contained three questions: the attitude to TCM (the Likert 5-level scoring method was used, with 1 point for “very unconvinced” and 5 point for “very convinced”), experience of TCM treatment before, and the intention to seek subsequent TCM treatment. The fourth part asked non-TCM users about the reasons for non-TCM use.

The fifth section contained details of TCM use, including treatment means, the timing, and the purpose. There are several definitions in this section:

Internal therapy: treating diseases using oral administration.¹⁰ The present study included Chinese herbal medicine, therapeutic food, and health products.

External therapy: external application of herbal medicine or exposure of the bodily surface to appliances.¹¹ Moxibustion, acupoint application, lotions/fumigants, and TCM enemas/suppositories were included in this study.

Non-drug therapy: lifestyle management, dietary adjustment, psychological adjustment, exercise, and external conditioning constitute five cornerstones of TCM health management.¹² Non-drug therapy in our study included acupuncture, Chinese massage, cupping, and traditional Chinese exercises.

Length of TCM use: the final length was the sum of each treatment used.

Statistical Analysis

All data were analyzed using Statistical Package for Social Sciences (SPSS) version 26. Missing values of annual income per capita were handled using multiple imputations. We did not use statistical methods to impute other missing values, and they were included in the statistical calculation. Categorical variables were reported as a proportion (%), and numerical data were reported as a median and range. Univariate analyses were performed using a *t*-test or chi-squared test as appropriate. A multivariate logistic regression analysis was performed for the multivariate analyses. All *p*-values were considered to be statistically significant at a two-tailed $p < 0.05$. An online tool (<https://dycharts.com/>) was used for the graphs.

Results

We consecutively recruited 809 patients. Excluding patient deaths (4) and those lost to follow-up (70), a total of 735 (90.9%) individuals were contacted. Twenty-two invalid questionnaires and 22 patients who refused follow-up were excluded. The final analyzed questionnaires amounted to 691 (Figure 1).

Factors Associated with Seeking TCM

Demographic and Socioeconomic Characteristics

In this study, 326 (47.2%) participants had used at least one type of TCM, and the median age of the patients was 55 years (range: 29–88 years). Three hundred and twenty-five (47.0%) of the surviving patients were unemployed, 188 (27.2%) were retired, and 178 (25.8%) were in employment at the time of the surveys. A total of 56.4% (390) lived in an urban area; what is more, 65.7% (454) had achieved education at the level of middle school or below. Most patients' (423, 61.2%) annual income per capita was higher than 30,000 RMB yuan (Table 1).

With increased age, preferences toward TCM use were lower ($P = 0.034$). The participants were unemployed, lived in rural areas, had a middle school education or below, or had an annual income per capita of less than 30,000 RMB yuan, had a lower prevalence of TCM use (all $P < 0.001$) (Table 1).

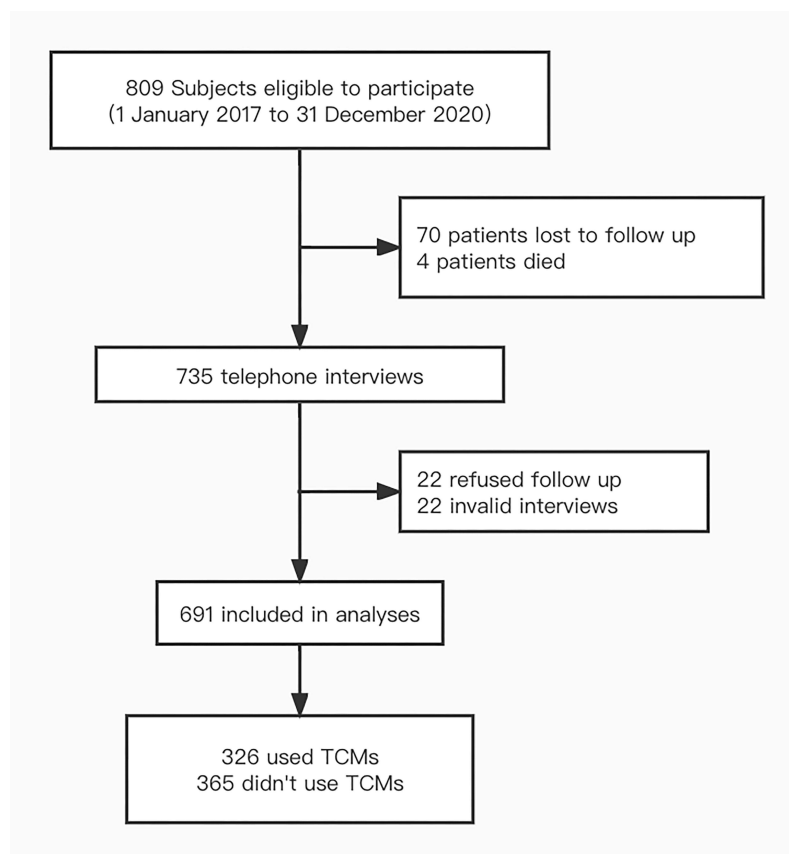


Figure 1 Flow chart.

Disease-Related Information

The median time to the end of the treatment was 41 months (17–67 months). The most common type of pathology was luminal B (HER-2 -negative) (385, 55.7%), and 500 (72.4%) patients were at stages I–II. Five hundred and fifty-eight (80.8%) patients accepted chemotherapy, 452 (65.4%) accepted radiotherapy, 502 (72.6%) accepted endocrine therapy, and 146 (21.1%) accepted targeted therapy (Table 1).

Patients accepted chemotherapy (275, 84.4%, $P = 0.023$), or accepted radiotherapy (230, 33.3%, $P = 0.007$) were more likely to use TCM. Stages were different between users and non-users ($P = 0.005$) (Table 1).

Belief in TCM and TCM Usage Before

Most participants held a positive attitude toward TCM (171 (24.7%) with a score of 5 and 273 (39.5%) with a score of 4) (Figure 2). Patients who believed in TCM (a score of 4 or 5, 260, 37.6%) were more inclined to use TCM ($P < 0.001$). 50.4% (348) patients were TCM users before. Non-TCM users before had a lower prevalence of TCM use ($P < 0.001$) (Table 1).

Multivariate Analyses

Logistic regression analyses revealed that residential area (rural vs urban, OR = 1.68, 95% CI: 1.17–2.41), education (high middle school or above vs middle school or below, OR = 2.08, 95% CI: 1.41–3.05), annual income per capita (OR = 0.86, 95% CI: 0.58–1.26), TCM users before (yes vs no, OR = 1.75, 95% CI: 1.25–2.44), stage of diagnosis ($P = 0.006$, stages I–II vs stage 0, OR = 3.12, 95% CI: 1.56–6.23; stages III–IV vs stage 0, OR = 1.42, 95% CI: 0.91–2.21) and trust in TCM ($P < 0.001$, neutralized vs disbelieved, OR = 4.69, 95% CI: 2.20–10.01; believed vs disbelieved, OR = 3.54, 95% CI: 2.41–5.19) were independent predictors of TCM use (Table 2).

Table I Description of Sample Characteristics

	Total (691)	Users of TCM (326)	Not Users of TCM (365)	
Demographic information				
Age (years, median, range)	55 (29, 88)	54 (30, 84)	59 (29, 88)	0.034
Married	634 (91.8)	296 (90.8)	338 (92.6)	0.389
Occupation				< 0.001
Unemployed	325 (47.0)	123 (37.7)	202 (55.3)	
Retired	188 (27.2)	104 (31.9)	84 (23.0)	
Employed	178 (25.8)	99 (30.4)	79 (21.6)	
Employee	112 (62.9)	65 (65.7)	47 (59.5)	
Freelance	44 (24.7)	14 (14.1)	30 (38.0)	
Supervisor	21 (11.8)	19 (19.2)	2 (2.5)	
Missing	1 (0.6)	1 (1.0)	0	
Residential area				< 0.001
Urban	390 (56.4)	212 (65.0)	178 (48.8)	
Rural	296 (42.8)	114 (35.0)	182 (49.9)	
Missing	5 (0.7)	0	5 (1.4)	
Socioeconomic information				
Education				< 0.001
Middle school or below	454 (65.7)	180 (55.2)	274 (75.1)	
High middle school and above	234 (33.9)	146 (44.8)	88 (24.1)	
Missing	3 (0.4)	0	3 (0.8)	
Annual income per capita (RMB yuan, median, range)	30,000 (20,000, 50,000)	40,000 (20,000, 50,000)	30,000 (15,000, 45,000)	< 0.001
< 30,000 RMB yuan	268 (38.8)	102 (31.3)	166 (45.5)	< 0.001
≥ 30,000 RMB yuan	423 (61.2)	224 (68.7)	199 (54.5)	
Disease-related information				
The time to the end of treatment (m, median, range)	41 (17, 67)	42 (17, 67)	41 (17, 67)	0.790
Pathological types				0.611
Luminal A	40 (5.8)	19 (5.8)	21 (5.8)	
Luminal B (HER-2 positive)	101 (14.6)	44 (13.5)	57 (15.6)	
Luminal B (HER-2 negative)	385 (55.7)	183 (56.1)	202 (55.3)	
HER-2 positive	67 (9.7)	28 (8.6)	39 (10.7)	
Triple negative	98 (14.2)	52 (16.0)	46 (12.6)	
Stage of diagnosis				0.005
Stage 0	68 (9.8)	21 (6.4)	47 (12.9)	
Stages I–II	500 (72.4)	237 (72.7)	263 (72.1)	
Stages III–IV	123 (17.8)	68 (20.9)	55 (15.1)	
Chemotherapy (yes)	558 (80.8)	275 (84.4)	283 (77.5)	0.023
Chemotherapy cycle				0.213
0	133 (19.2)	51 (15.6)	82 (22.5)	
≤4	126 (18.2)	61 (18.7)	65 (17.8)	
5/6	103 (14.9)	51 (15.6)	52 (14.2)	
8	312 (45.2)	153 (46.9)	159 (43.6)	
>8	17 (2.5)	10 (3.1)	7 (1.9)	
Radiotherapy (yes)	452 (65.4)	230 (70.6)	222 (60.8)	0.007
Endocrine Therapy (yes)	502 (72.6)	234 (71.8)	268 (73.4)	0.628
Targeted Therapy (yes)	146 (21.1)	62 (19.0)	84 (23.0)	0.199
Other Therapy (yes)	6 (0.9)	3 (0.9)	3 (0.8)	0.899

(Continued)

Table I (Continued).

	Total (691)	Users of TCM (326)	Not Users of TCM (365)	
Trust in TCM				< 0.001
Believed	444 (64.3)	260 (79.8)	184 (50.4)	
Neutralized	200 (28.9)	55 (16.9)	145 (39.7)	
Disbelieved	45 (6.5)	10 (3.1)	35 (9.6)	
Missing	2 (0.3)	1 (0.3)	1 (0.3)	
TCM users before (yes)	348 (50.4)	193 (59.2)	155 (42.5)	< 0.001

Sought Subsequent Treatment

The patients who had the intention to seek subsequent help in the form of TCM treatment out of the total population amounted to 357 (51.7%) (Figure 3a), including 240 (73.6%) users of TCM (Figure 3b) and 117 (32.1%) non-TCM users (Figure 3c).

Details of TCM Use

Most respondents (193, 59.2%) did not inform their physician (Figure 4a), and about half (166, 50.9%) of users of TCM relied on a network query for information, with other means, including relatives (73, 22.4%), breast cancer patients (30, 9.2%), physicians (21, 6.4%), and others (33, 10.1%) (Figure 4b). Regular hospitals (165, 50.6%) and clinics (81, 24.8%) constituted the main treatment pathway (Figure 4c); concerning patients’ attitude toward TCM, most of the respondents (221, 67.8%) demonstrated a positive attitude toward TCM (42.0% were satisfied and 25.8% were very satisfied) (Figure 4d). About 6.1% (20) demonstrated a negative attitude, the main reasons for which were failing to achieve the expected results (15) and spending too much money (6) (Figure 4e). Less than half (134, 41.1%) have recommended TCM to other patients (Figure 4f). The length of TCM use is presented in Figure 4g. For most patients, TCM use was short-term only (153, less than three months).

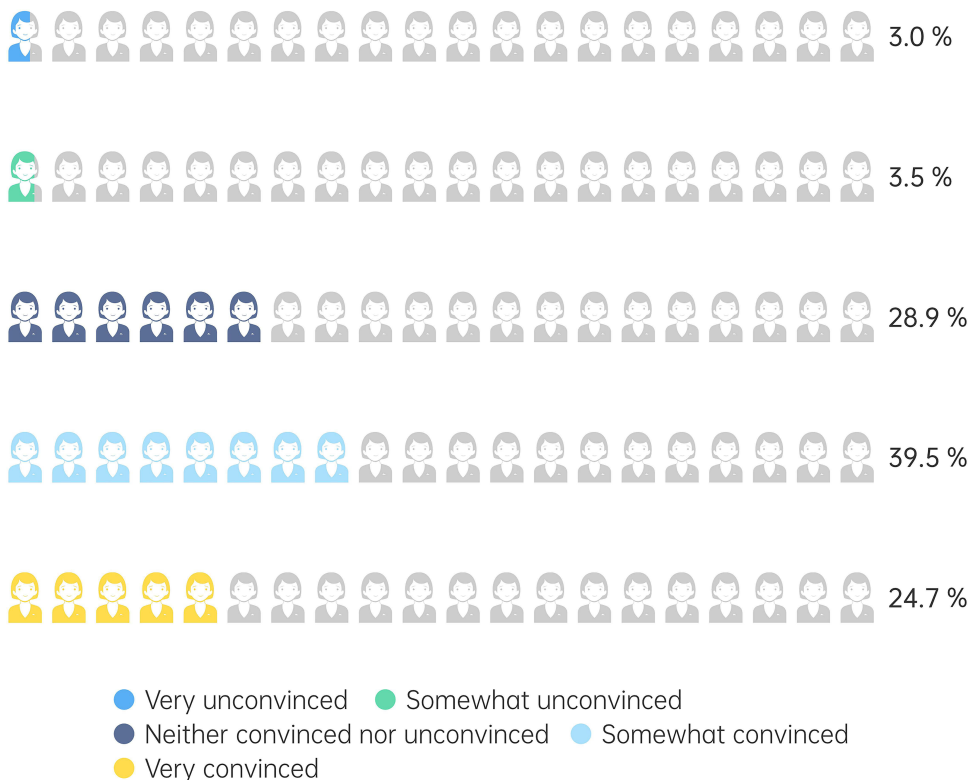


Figure 2 Attitude to TCM in total participant.

Table 2 Logistic Regression

	OR	95% CI	P-value
Residential area (vs rural)	1.68	1.17–2.41	0.005
Education (vs middle school or below)	2.08	1.41–3.05	< 0.001
Annual income per capita (RMB yuan)	0.86	0.58–1.26	0.436
TCM users before (vs no)	1.75	1.25–2.44	0.001
Stage of Diagnosis (vs Stage 0)			0.006
Stage I–II	3.12	1.56–6.23	0.001
Stage III–IV	1.42	0.91–2.21	0.118
Trust in TCM (vs Disbelieved)			< 0.001
Neutralized	4.69	2.20–10.01	< 0.001
Believed	3.54	2.41–5.19	< 0.001

Abbreviations: OR, Odds Ratio; CI, Confidence Interval.

Treatment Means

Treatment means included internal therapy (296, 90.8%), external therapy (86, 26.4%) and non-drug therapy (76, 23.3%). In internal therapy, Chinese herbal medicine demonstrated the highest frequency (251, 84.8%); this was represented by moxibustion (56, 65.1%) in external therapy and Chinese massage (61, 80.3%) in non-drug therapy (Table 3).

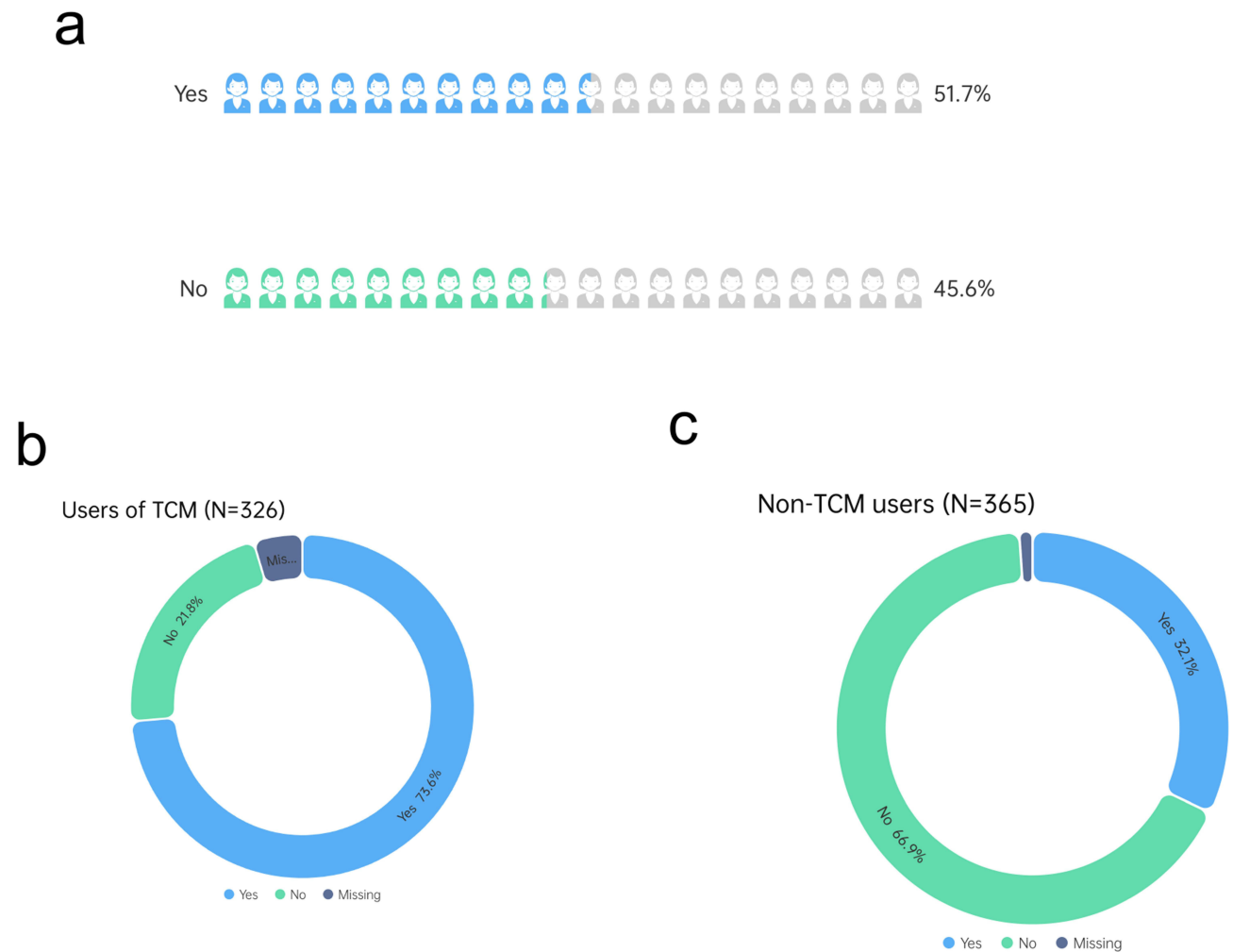


Figure 3 Sought subsequent treatment (The total population: (a), Users of TCM: (b), and Non-TCM users: (c)).

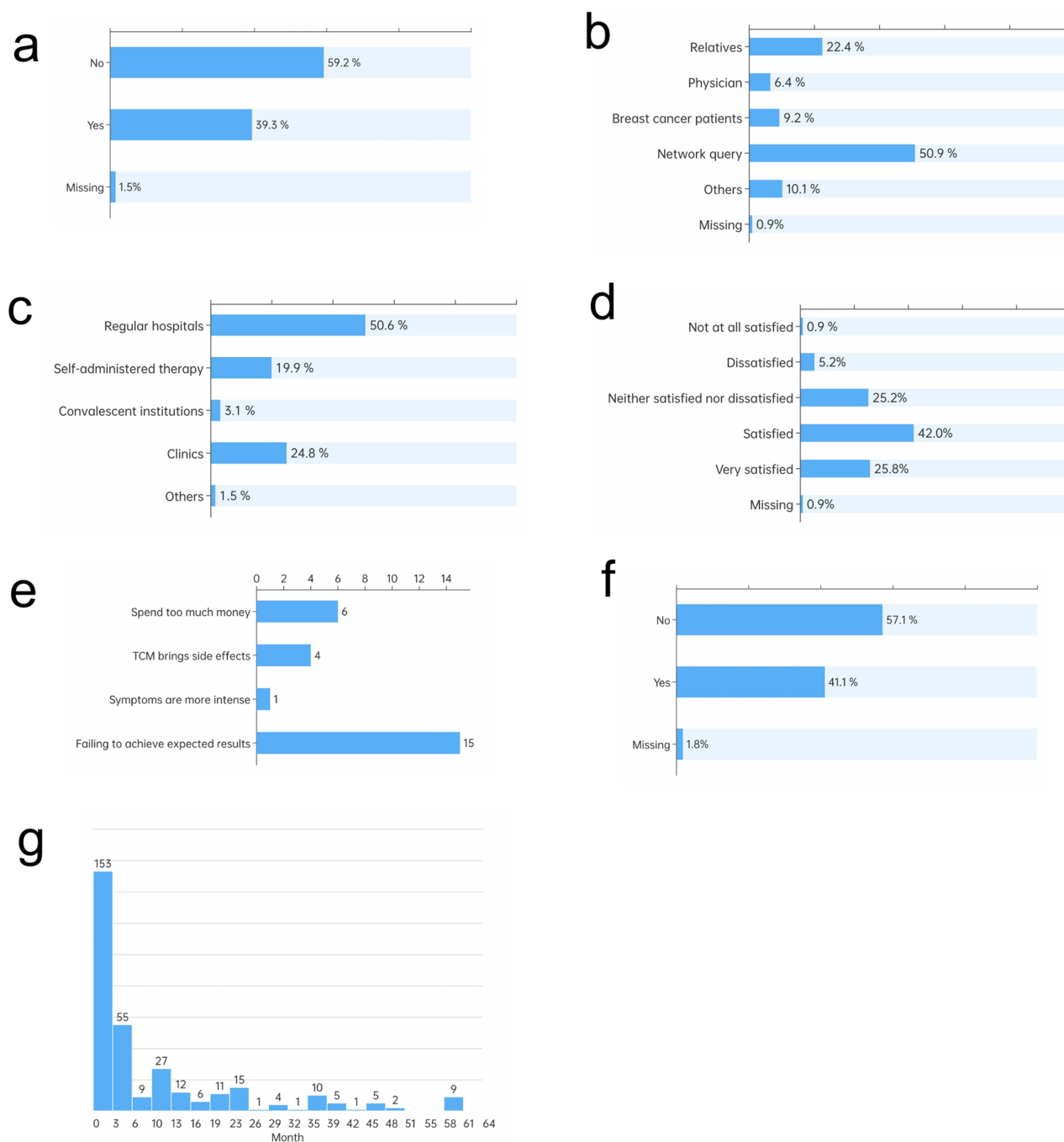


Figure 4 Details of TCM use (Informed physician: (a), Access to information: (b), Main treatment pathway: (c), Therapeutic effect evaluation: (d), The reason for dissatisfaction with TCM: (e), Have recommended TCM to other patients: (f), The length of TCM use: (g)).

The Timing and Purpose of TCM Use

Most users use TCM during endocrine therapy (215, 66.0%) and after comprehensive Western medicine treatment (92, 28.2%). Only 2.1% (7) of users use TCM during surgery (Table 4).

The primary aim of TCM use in our study was overall conditioning (279, 85.6%), followed by alleviating the side effects of Western medicine (126, 38.7%). The top-three side effects that they wanted to address were diarrhea/constipation (58, 46.0%), sleep disturbance (35, 27.8%) and joint pain (30, 23.8%) (Table 5).

Table 3 TCM Treatment Means

	n	Percentage (%)
Internal therapy	296	90.8
Chinese herbal medicine	251	84.8
Therapeutic food	71	24.0
Health products	51	17.2
External therapy	86	26.4
Moxibustion	56	65.1
Acupoint application	39	45.3
Lotions/fumigant	19	22.1
TCM enema/suppositories	3	3.5
Non-drug therapy	76	23.3
Acupuncture	26	34.2
Chinese massage	61	80.3
Cupping	26	34.2
Traditional Chinese Exercises	28	36.8

Table 4 The Timing of TCM Use

	n	Percentage (%)
Before pathological diagnosis	19	5.8
During surgery	7	2.1
During chemotherapy	40	12.3
During radiotherapy	22	6.7
During endocrine therapy	215	66.0
During targeted therapy	16	4.9
After Western medicine comprehensive treatment	92	28.2

Table 5 The Purpose of TCM Use

	n	Percentage (%)
Overall conditioning	279	85.6
Psychological comfort	65	19.9
Cancer treatment	73	22.4
Alleviate side effects of Western medicine	126	38.7
Hair loss	2	1.6
Nausea and vomiting	15	11.9
Myelosuppression	5	4.0
Stomatitis	5	4.0
Diarrhea/constipation	58	46.0
Hand-Foot Syndrome	16	12.7
Visceral toxicity	6	4.8
Cutaneous side effects	3	2.4
Night sweats	18	14.3
Sleep disturbance	35	27.8
Joint pain	30	23.8
Others	10	7.9

The Reason for Non-TCM Use

Over a quarter of non-TCM users did not use TCM due to “not being recommended by a physician” (198, 54.2%). The second reason was “did not know which TCM doctor to seek for” (139, 38.1%), followed by “reject China herbal

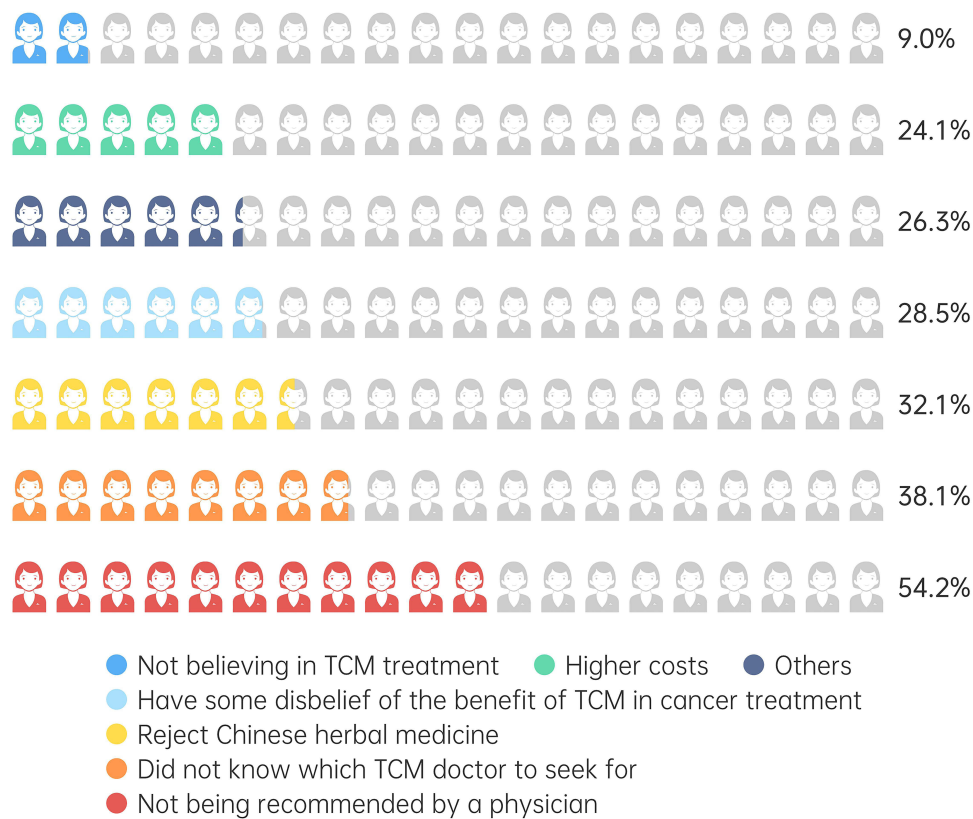


Figure 5 The reason for non-TCM use.

medicine” (117, 32.1%). Only 24.1% (88) of patients did not use it due to “higher costs”, and a very small number stated that it was due to “not believing in TCM treatment” (33, 9%) (Figure 5).

Discussion

Our results revealed that approximately half of the breast cancer patients had already sought TCM help and that nearly one-third of non-TCM users intended to seek TCM help. Most TCM users evaluated TCM favorably. Most participants, be they TCM users or not, maintained an attitude of trust toward TCM. Overall, our participants had a high demand and great endorsement for TCM. This finding was somewhat unexpected and intriguing. They may seek TCM for help after finding a breast mass. However, the proportion was not high among our patients; in fact, it was somewhat low (5.8%). This finding has significant implications. Our study revealed a high need for TCM among breast cancer patients. To our knowledge, this is the first study to evaluate TCM needs amongst this group of patients.

The phenomenon of most Chinese believing in TCM and a small proportion preferring TCM treatment to Western medicine treatment when they are sick is common.¹² This seeming contradiction may be explained by the “overall conditioning purpose” — most patients used TCM based on the overall conditioning aim. That is to say, in their traditional conception, TCM played the role of adjunct therapy rather than the main role, and WM was more convenient.^{13–15} People with acute symptoms were inclined to seek Western medicine, while those with chronic symptoms flocked to Eastern medicine.¹⁶

Similar previous studies investigated the situation of TCM use in a certain population.¹⁷ Even though those studies had a large sample size or a long duration of follow-up, a lack of sufficient information^{18,19} and large heterogeneity^{20,21} were found between these studies. Our population consisted of only breast cancer cases, whereby providing an excellent degree of consistency. Beyond this, we probed some issues in more depth, eg, TCM pattern types, purposes related to TCM interventions, influencing factors, people’s understanding and attitude, the efficacy of interventions, and so on. Thus, we could better understand the needs of patients.

High education, high income, and urban background were associated with TCM use in our research. This conclusion followed the results of “the majority relied on network query for information” and “regular hospital was the main treatment pathway.” To some extent, participants with a high level of cognition demonstrated more demand for TCM services. This conclusion is consistent with Xin’s study²¹ but inconsistent with Tina L’s study.²² This might be because of the difference in study subjects (the participants in Tina L’s study were Hong Kong-born Chinese individuals).

Among TCM treatments, TCM drugs constitute an important means. Chinese herbs and their combinations as prescriptions have been tested by people for thousands of years, and a wide variety of diseases can be treated by iteratively finding natural products that have improved clinical effectiveness.^{15,23–25} In a proportion of these respondents’ impressions, TCM drugs mean TCM; therefore, “reject China herbal medicine” was the second reason for no TCM use. Indeed, TCM is an extremely broad discipline, as we have mentioned. It is noteworthy that short-term use was most common amongst TCM users.

In addition to the purpose of overall conditioning, the other main purpose was that of alleviating the side effects of Western medicine and the most common side effect to alleviate is diarrhea/constipation. TCM has a long history and unique advantages in alleviating this side effect.^{26,27} Therefore, this result is within our expectations. Reviewing our study, amongst the population with this purpose, six patients indicated that they were dissatisfied (two for sleep disturbance, one each for joint pain, night sweats, stomatitis, and fatigue, respectively). In total, alleviating the side effects of Western medicine through TCM therapy was recognized by our patients. It has been proven that TCM may be capable of protecting cancer patients from suffering from complications, reducing the side effects of conventional treatment, and improving the quality of life and survival.^{15,28,29}

An interesting phenomenon happened between the team members and survey respondents. Over half of TCM users did not inform their physician, and more than half of non-TCM users selected the reason of “not being recommended by a physician.” Our neutral attitude toward TCM affected patients’ selection to some extent. In the context of breast cancer patients’ TCM needs, professional guidance and personalized advice are particularly important.

Limitation

This study has some notable limitations. First, cost is a topic of great interest to patients. However, there were missing data in our study, and we cannot provide further analysis. Second, the TCM use length was the sum of each treatment — thus, we cannot provide further details on each treatment. Third, the follow-up time was short compared to breast cancer patients’ long treatment durations and better prognoses.

Conclusion

There is a great TCM need amongst breast cancer survivors who have been receiving WM treatment. The lead physician plays an important role in patients’ TCM healthcare-seeking behavior. Most patients reported that TCM treatment was effective. Enhanced communication concerning TCM was called for WM doctors.

Abbreviations

TCM, traditional Chinese medicine; WM, Western medicine.

Data Sharing Statement

The raw data supporting the conclusions of this article will be made available by the corresponding author, without undue reservation.

Ethics Approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Shanxi Bethune Hospital Ethics Committee (No. YXLL-2023-153).

Consent to Participate

The patients/participants provided their written informed consent to participate in this study. The manuscript has been read and approved by all the authors.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors have no relevant financial or non-financial interests to disclose for this work.

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