Symptom Distress and Its Association With Traditional Chinese Medicine Use in Chinese American Women With Cancer

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The Chinese American population, comprising 26% of the Asian American population, is about 3.8 million, according to the 2010 census (U.S. Census Bureau, 2010). Half of all Chinese Americans in the United States live in California or New York. New York City has multiple Chinatowns and the largest metropolitan Chinese population outside of Asia (McCabe, 2012), and Chinese immigrants continue to move to New York City (McCabe, 2012). Because this is a growing population with possible unique healthcare needs, understanding these needs through investigations is important.

Chinese Americans have been reported to be particularly vulnerable to poorer health, given their limited language skills (Yi, Swartz, & Reyes-Gibby, 2011) and the diversity of the group, which is differentially affected by cultural, socioeconomic, legal, and political determinants (Derose, Escarce, & Lurie, 2007). One area of health disparities research in the Chinese American community is cancer. Patients with cancer experience a variety of symptoms as a result of their disease and treatment for that disease. Multiple symptoms, including fatigue, severe nausea and vomiting, depression, and pain, have been reported in patients who are in treatment for various cancers (Cleeland et al., 2013; Gwede, Small, Munster, Andrykowski, & Jacobsen, 2008; Liu, Ercolano, Siefert, & McCorkle, 2010). These symptoms have a profound negative influence on physical, psychosocial, and spiritual well-being (Wu & Harden, 2014). Understanding the symptom experience of patients with cancer is vital because it enables clinicians to systematically evaluate the quality of life of patients with cancer. Until now, very limited cancer research has been conducted on Chinese Americans in New York City. In addition, the symptomatology and symptom management in Chinese Americans with cancer are particularly poorly understood.

One common strategy for symptom management in Chinese American patients with cancer is the use of

Purpose/Objectives: To identify symptom distress related to cancer for a group of Chinese American women in treatment, and to examine their use of various forms of traditional Chinese medicine (TCM) and their relationships to specific symptoms they identified.

Design: Cross-sectional, correlational.

Setting: American Cancer Society Asian Initiatives support groups in the state of New York.

Sample: 97 Chinese American women residing in New York with a mean age of 57 years; the time since diagnosis of cancer ranged from two months to 24 years. The type of diagnosis for the majority of women was breast cancer.

Methods: A self-reported questionnaire including a demographic data form, a researcher-developed checklist for types of TCM, and the Memorial Symptom Assessment Scale Short Form (MSAS-SF) were administered. The MSAS-SF has three subscales: global distress index, psychological symptom distress scale, and physical symptom distress scale.

Main Research Variables: Symptoms, symptom distress, and types of TCM. The descriptive statistics and Mann-Whitney U tests were applied for data analysis.

Findings: Chinese American women with cancer in treatment reported multiple symptoms, and the three MSAS-SF distress subscale scores indicated moderate symptom distress. Symptoms were positively associated with the use of TCM.

Conclusions: Chinese American women in treatment for cancer reported multiple symptoms and moderate symptom distress. Participants with specific symptoms tended to use specific forms of TCM.

Implications for Nursing: High prevalence of psychological symptoms for Chinese American women with cancer suggests that oncology nurses should work with mental health providers for symptom management of this population. Oncology nurses also need to stay informed of the growing body of evidence on the benefits of TCM for patients with cancer. Future studies should include an emphasis on the improvement in methodologic quality for studies that investigate using TCM in participants with cancer.

Key Words: Chinese American women; cancer; symptom; symptom distress; traditional Chinese medicine

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traditional Chinese medicine (TCM). TCM has been used for thousands of years in China and is practiced widely in cancer centers in the United States. TCM is based on a clear rationale and well-established theoretical framework, albeit on a different philosophic premise. According to a systemic review about the use of TCM in the treatment of cancer, which included 2,385 randomized, controlled trials and 579 non-randomized, controlled studies in China, TCM was reported to have an effect on clinical symptom improvement (1,667 studies, 56%), followed by biomarker indices (1,270 studies, 43%), quality of life (1,129 studies, 38%), and chemotherapy- and radiation therapy–induced side effects (1,094 studies, 37%) (Li et al., 2013). However, available research in the United States indicated that the participants generally had only a few cancer types and symptoms; single treatments were studied, such as use of acupuncture in pain management in breast cancer (Wong-Kim & Merighi, 2007). A more comprehensive picture about the use of TCM for multiple symptoms of patients with cancer may offer a more comprehensive picture of its effect on symptom management. The purpose of this study, therefore, was to examine the use of TCM and its relationship with multiple symptoms. A significant association was hypothesized between the use of TCM and symptoms among Chinese American women with cancer.

Methods

Design, Setting, and Participants

Following approval from the Adelphi University Institutional Review Board, a cross-sectional, correlational study was conducted from September 2012 to February 2013. A convenience sample was used. Participants were recruited through the American Cancer Society (ACS) Asian Initiatives support group programs. The researchers in the current study joined the weekly meetings of the cancer support groups to explain this study. Participants selected for this study met the following inclusion criteria: Chinese immigrant or American-born Chinese, female, at least 18 years of age, diagnosed with cancer, residing in New York City, and able to give written informed consent. Participants who could not communicate in Chinese or English or who had any psychiatric disorders were excluded.

Self-reported questionnaires were distributed after weekly meetings through the ACS support group programs by two bilingual researchers. Interested participants met with the researchers after the weekly meetings. The on-site researchers provided clarification about questionnaire items and answered questions. After informed consent was obtained, each participant was given the self-administered questionnaire. The survey was available in Chinese and English, but all participants chose to complete it in Chinese. Participants received an incentive (a $10 gift card) after they completed the questionnaires. One hundred and twelve participants were approached. Twelve participants declined enrollment, mainly because of time constraints. Three participants were excluded because of incomplete questionnaires. Ninety-seven participants who finished the self-administered survey were included in the statistical analysis.

Measures

Demographic and clinical data were collected using self-report measures. Demographic data included country of origin, years lived in the United States, English proficiency level, age, marital status, annual household income, education level, religion, and medical insurance information; medical data included type of cancer, year of cancer diagnosis, site of cancer, stage of cancer at diagnosis, and cancer treatments (i.e., surgery, chemotherapy, and radiation therapy).

Symptom distress was assessed using the Memorial Symptom Assessment Scale Short Form (MSAS-SF). Instead of asking the participants about their symptom distress within seven days, the researchers asked the participants to recall the symptom distress during active treatment. The MSAS-SF is an instrument in which participants rate symptom distress associated with 26 physical symptoms and the frequency of four psychological symptoms. Physical distress was rated using a five-point Likert-type response (0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, 4 = very much). Frequency of psychological symptom distress is scored as rarely (1), occasionally (2), frequently (3), and almost constantly (4). The three subscales of the MSAS-SF include the global distress index (GDI) (four psychological symptoms and six physical symptoms), physical symptom distress scale (PHYS) (12 prevalent physical symptoms), and psychological symptom distress scale (PSYCH) (six prevalent psychological symptoms). The MSAS-SF has been reported to have good validity and reliability in American (Cronbach's alpha ranged from 0.76–0.87) and Chinese populations (Cronbach's alpha ranged from 0.84–0.91) (Chang, Hwang, Feuerman, Kasimis, & Thaler, 2000; Lam et al., 2008).

Items regarding the assessment of the use of TCM also were limited to the period that the participants had active treatment. Types of TCM and effectiveness were assessed by the researcher-developed checklist, which included the three most commonly used forms of TCM: Chinese herbal medicine, acupuncture, and qigong or tai chi. Two TCM practitioners in New York City reviewed and agreed with the items in the checklist before giving it to participants. Cronbach's alpha of this checklist was 0.86.

Data Analysis

All data analyses were performed using SPSS®, version 13.0. Descriptive statistics were used to summarize the data. Types and prevalence of symptoms were described with percentages. Total MSAS-SF (TMSAS) score, GDI, PHYS, and PSYCH were described by means. The Mann-Whitney U test was applied to evaluate each type of TCM that correlated with the symptoms. Bivariate correlation and regression analysis were applied to examine the association between the symptoms and various forms of TCM while controlling other demographic and disease characteristics. The significance level of all analyses was set at $p < 0.05$, and all tests were two-sided.

Table 1. Sample Characteristics (N = 97)

Characteristic	$\bar{X}$	SD
Age (years)	51.7	11.3
Years in the United States	19.8	10
Years since diagnosis	6.1	5.4
Characteristic		**n**
English proficiency		
None		21
A little		39
Fair		18
Good/very good		19
Marital status		
Never married		5
Divorced/separated		10
Married		78
Widowed		4
Education		
Grade school		55
Vocational/technical school		14
College and undergraduate		24
Graduate school		4
Religion		
None		33
Christian/Catholic		25
Buddhism/Taoism		39
Annual income ($)		
0–9,999		50
10,000–29,999		30
30,000–49,999		11
50,000–69,999		2
70,000–89,999		4
Insurance		
Private		27
Medicare/Medicaid		68
Out-of-pocket		2
Type of cancer		
Breast cancer		70
Other		27
Stage		
I		40
II		29
III		14
IV		14
Treatment		
Surgery only		16
Chemotherapy and/or radiation		13
Surgery with chemotherapy and/or radiation		68

Results

Demographic characteristics of the sample (N = 97) are listed in Table 1. All of the participants were Chinese immigrants, and no American-born Chinese women were included. The average time since immigration to the United States was 20 years, and the average age of participants was 52 years. About 82% of participants had low income, and 28% completed college or more than college. The majority (72%) had a diagnosis of breast cancer, and 71% reported earlier stages of cancer (stage I or II) at diagnosis.

Table 2 shows the 28 physical symptoms and four psychological symptoms rank-ordered from highest to lowest in terms of the frequency reported by the participants. Of the 28 physical symptoms, the five most frequently reported symptoms were difficulty sleeping (n = 68), dry mouth (n = 61), lack of appetite (n = 60), numbness or tingling in hands and feet (n = 60), and pain (n = 52). The prevalence of the four psychological symptoms were worrying (n = 77), feeling nervous (n = 72), feeling sad (n = 71), and feeling irritable (n = 71). The majority of participants reported experiencing psychological symptoms at least "occasionally." The prevalence of psychological symptoms was higher than the prevalence of physical symptoms in general. Symptom distress of the 10 most prevalent physical symptoms and all psychological symptoms are presented in Table 3.

The average number of symptoms reported was 14.84 (SD = 6.83), indicating multiple symptoms. The mean scores of the subscales of physical symptom distress were 1.02 (PHYS), 1.38 (PSYCH), 1.32 (GDI), and 0.98 (TMSAS).

Table 4 describes the self-reported use of TCM by participants. Thirty-seven participants used lingzhi in the active treatment phase of cancer, followed by taiji (n = 26), seeing a TCM practitioner to take a combination of herbs (n = 14), qigong (n = 11), panax ginseng (n = 10), and acupuncture (n = 8). None of the TCM forms was considered "very effective." The majority of participants who used them reported that they had "no or little effect."

Table 5 demonstrates the positive association between the use of acupuncture and several symptoms of distress, such as pain, feeling bloated, and dizziness. Participants who reported more pain, feeling bloated, and dizziness used acupuncture more. Table 6 shows the positive association between panax ginseng, lack of energy, nausea, vomiting, shortness of breath, sweats, and sexual dysfunction. Participants who reported

more lack of energy, nausea, vomiting, shortness of breath, sweats, and sexual dysfunction used more panax ginseng. No significant associations were made between lingzhi, qigong, taiji, seeing a TCM practitioner, and symptom distress. Bivariate correlation and regression analysis were applied to examine the association between these symptoms and acupuncture and panax ginseng, while controlling for other demographic and disease characteristics. No significant changes were observed in the results of the analysis.

Table 2. Symptom Prevalence in Chinese American Women With Cancer in Treatment (N = 97)

Symptom	Frequency (n)
Worrying	77
Feeling nervous	72
Feeling sad	71
Feeling irritable	71
Difficulty sleeping	68
Dry mouth	61
Numbness or tingling in hands and feet	60
Lack of appetite	60
Pain	52
Hair loss	50
Lack of energy	48
Changed food taste	48
Feeling drowsy	47
Weight loss	46
Change in skin	43
Difficulty concentrating	41
Self-dislike	41
Sexual dysfunction	40
Mouth sores	39
Constipation	39
Cough	38
Feeling bloated	37
Dizziness	36
Nausea	35
Sweats	33
Itching	31
Vomiting	29
Shortness of breath	28
Diarrhea	25
Difficulty swallowing	20
Swelling of arms and legs	20
Problems with urination	13

Discussion

Sample Characteristics

Only women were included in this study because women were reported to be more likely to use complementary and alternative therapies compared to men (Fouladbakhsh & Stommel, 2010). As a demographic group, Chinese Americans overall are highly educated and earn higher incomes when compared to other minority demographic groups in the United States (University of Maryland, 2008). The current sample represented a low-income group with poor English proficiency, which may be related to the population's limited education level. English proficiency was limited and required participants to live in the Chinatown area for convenience of life and cultural familiarity.

The ACS Asian Initiatives support group was located in Chinatown, and the sample of the study mainly represented poor Chinese Americans. The age and marital status of this sample were similar to those in other studies in Chinese Americans (Nguyen et al., 2010; Sun, Basch, Wolf, & Li, 2004). The religious affiliation of the sample (70% or greater) was much higher than average for Chinese Americans (50% or less) (Pew Forum, 2012), which could have been related to living a relatively long time in the United States (range = 10–30 years, with an average of 20 years).

The majority of the sample had breast cancer, which was consistent with the literature in which breast cancer is the most commonly diagnosed cancer in Asian American women (Office on Women's Health of the U.S. Department of Health and Human Services, 2010). About 70% of the sample was diagnosed with early-stage (stages I and II) cancer, and the majority had surgery with chemotherapy or radiation therapy (68%). Very little information is available about diagnosis, stage, and treatment in Chinese American women with breast cancer; therefore, comparing and concluding if the sample in this study represented the characteristics of the population in the United States in general was difficult.

Symptom Distress

The most frequently reported physical symptoms were difficulty sleeping, dry mouth, numbness or tingling in hands and feet, lack of appetite, and pain, which corresponded to symptoms that participants

Table 3. Symptom Distress for the Most Frequently Reported Physical and Psychological Symptoms in Chinese American Women With Cancer (N = 97)

Physical Symptom	Distressed Not at All or a Little n	Distressed Somewhat n	Distressed Quite a Bit or Very Much n
Changed food taste	11	18	19
Difficulty sleeping	23	28	17
Dry mouth	18	19	24
Feeling drowsy	9	21	17
Hair loss	6	11	33
Lack of appetite	20	22	18
Lack of energy	15	14	19
Numbness or tingling in hands and feet	22	16	22
Pain	11	17	24
Weight loss	16	14	16
Psychological Symptom	**Occurs Rarely n**	**Occurs Occasionally or Frequently n**	**Occurs Almost Constantly n**
Feeling irritable	24	34	13
Feeling nervous	24	28	20
Feeling sad	28	36	7
Worrying	20	37	20

with breast cancer reported in the literature (Cheng, Darshini Devi, Wong, & Koh, 2014; Gwede et al., 2008; Hofsø, Miaskowski, Bjordal, Cooper, & Rustøen, 2012; Turner, Kelly, Swanson, Allison, & Wetzig, 2005), indicating that the physical symptoms of Chinese American women with breast cancer were similar to other groups of participants with breast cancer. The prevalence of psychological symptoms was higher in the current sample (greater than 70%) in contrast to other studies (Chang et al., 2000; Lam et al., 2008). Although higher prevalence of psychological symptoms also was reported in Lam's study on Chinese patients with cancer in active treatment, which included worrying (59%), feeling sad (48%), and feeling irritable (48%) (Lam et al., 2008), the prevalence of psychological symptoms was much higher than what was reported in the literature. Of note, the majority of the sample in this study was diagnosed with early-stage cancer. The high prevalence of psychological symptoms reported in this study underscores the need for providers to recognize the importance of symptom management as a first priority in nursing or health care. Why the psychological symptom scores were this high was not clear. One possible explanation for the high prevalence of psychological symptoms could be that Chinese American women may hesitate to take drugs to control psychological symptoms compared with other U.S. groups studied, so they experience more psychological symptoms. Another explanation could be related to the poor economic status of this sample.

Use of Traditional Chinese Medicine for Symptom Management

TCM commonly is used in Chinese patients with cancer and is considered safe and harmless (Xu, Towers, Li, & Collet, 2006). Patients with cancer in China often use conventional therapy and TCM together. TCM gradually is becoming accepted in other countries and more widely practiced; many patients with cancer in the United States use some form of TCM. Several systemic reviews show evidence that TCM, particularly Chinese herbal remedies, could help relieve symptoms such as pain, nausea and vomiting, and fatigue; relieve side effects of chemotherapy and radiation; and improve health-related quality of life (Li et al., 2013; Molassiotis, Potrata, & Cheng, 2009; Zhang, Liu, Li, He, & Tripathy, 2007). The percentage

Table 4. Perceived Effectiveness of the Use of Traditional Chinese Medicine (TCM) in Chinese American Women With Cancer in Treatment (N = 97)

Type of TCM	Not Effective n	A Little Effective n	Somewhat Effective n
Acupuncture	2	5	1
Lingzhi	21	13	3
Panax ginseng	1	7	2
Qigong	4	2	5
Seeing a TCM practitioner to take prescribed herbs	4	8	2
Taiji	9	13	4

Note. No participants were in the Very Effective category.

Table 5. Mann-Whitney U Test: Association Between Acupuncture and Symptom Distress

Symptom	Non-Users (n = 88)	Users (n = 9)	Mann-Whitney U	z	p
Difficulty concentrating	47.05	68.11	568	2.27	0.023
Dizziness	47.51	63.56	527	2.09	0.036
Feeling bloated	46.94	69.11	577	2.59	0.01
Pain	47.32	65.44	544	2.06	0.039

of participants using TCM in this study was higher than American women in general, which was reported to be from 6%–14% (Gansler, Kaw, Crammer, & Smith, 2008; Upchurch & Chyu, 2005). However, the percentage of patients using herbs in this study was much lower than Chinese women living in China (Simpson, 2003), in which 70% of patients or more used herbs (Chen et al., 2008). The percentage of participants using lingzhi (38%), using panax ginseng (11%), or seeing a TCM practitioner to take prescribed herbs in combination (14%) in this study was similar to Lee's study in San Francisco, California, 14 years ago, in which Lee reported that about 22% of Chinese Americans often used herbal remedies (Lee, Lin, Wrensch, Adler, & Eisenberg, 2000). The findings underscore the need for health education and intervention studies regarding the use of TCM, particularly herbs in Chinese American women with cancer, compared to other racial groups.

Although the percentage of Chinese Americans using herbs in this study was higher than other racial groups, the majority of the participants considered them "not effective" or "of little effect." Lingzhi (*Ganoderma lucidum*) is used widely and recommended by Asian physicians and naturopaths for its supporting effects on the immune system (Jin, Ruiz Beguerie, Sze, & Chan, 2012). Panax ginseng, a medical plant that has been used in China for thousands of years, is reported to be able to mitigate cancer through anti-inflammatory, antioxidant, and apoptotic mechanisms by influencing gene expression (Helms, 2004).

Although many studies conducted in China and other Asian countries tend to report the positive effects of herbs, the reported effect of herbs is mixed in Western countries. The perceived lack of effectiveness of herbs in this study may have been because of a lack of access by participants to competent TCM providers and herbs grown in the proper climate, environment, and geographic locations, as are available in China.

Additional studies are needed to examine the quality, amount, and frequency of herbs used to explore the reasons for relatively low effectiveness of TCM for Chinese American participants with cancer. A well-designed study to compare the use of similar herbs in cancer treatment and symptom management between participants in the United States and China potentially could provide this information.

In this study, 26 patients practiced taiji, 11 patients practiced qigong, and 8 patients used acupuncture. In 2,262 adults (aged 18 years and older) diagnosed with cancer from the 2002 National Health Interview Survey, only 2.4% of females used taiji and 0.5% used qigong (Fouladbakhsh & Stommel, 2010). The percentage of participants using taiji and qigong in Chinese American women was much higher than in American women in the national survey study. Similar to herbs, many researchers reported that taiji, qigong, and acupuncture use in cancer is safe and relieves pain, nausea and vomiting, depression, and lymphedema, and improves health-related quality of life (Chen et al., 2013; Smith & Bauer-Wu, 2012; Sprod et al., 2012). However, the majority of Chinese American participants with cancer in the current study reported that they had "little or no effectiveness." In addition, the effectiveness of taiji, qigong, and acupuncture might be related to the frequency of practicing taiji or qigong, the different types of taiji or qigong, and the competency of acupuncture practitioners. Therefore, caution in interpreting conclusions regarding the effectiveness of TCM must be exercised without knowing the detailed information of the type of TCM intervention.

This study showed positive associations among the use of acupuncture, panax ginseng, and some symptoms such as pain, lack of energy, and nausea

Table 6. Mann-Whitney U Test: Association Between Panax Ginseng and Symptom Distress

Symptom	Non-Users (n = 88)	Users (n = 9)	Mann-Whitney U	z	p
Lack of energy	46.83	64.38	694.5	2.18	0.03
Nausea	47.12	62.29	669.5	2.04	0.042
Sexual dysfunction	45.47	74	810	3.7	0.00
Shortness of breath	47.01	63.12	679.5	2.33	0.002
Sweats	46.37	67.62	733.5	2.91	0.004
Vomiting	46.54	66.42	719	2.83	0.005

Knowledge Translation

The percentage of use of traditional Chinese medicine (TCM) in Chinese American women with cancer is much higher than in American women in the United States.

Despite the relatively high percentage of use of TCM in Chinese American women with cancer, the majority of them consider TCM to have "little effectiveness" or "no effectiveness."

A positive association exists between symptoms and TCM. Participants with specific symptoms tend to use specific forms of TCM.

and vomiting. The study was consistent with the literature in that symptoms are predictors of complementary and alternative therapy use (Fouladbakhsh & Stommel, 2010). In the literature, acupuncture and panax ginseng were reported to relieve multiple symptoms for patients with cancer (Smith & Bauer-Wu, 2012), so when Chinese American women with cancer had symptoms, they began to use acupuncture and panax ginseng.

Of note, the association among acupuncture, panax ginseng, and symptom distress remained the same after controlling for other demographic and disease variables, such as stage of cancer, cancer type, and socioeconomic factors. The positive association between symptom distress and TCM indicated that oncology nurses and other practitioners should be aware of the higher prevalence of TCM use for symptom management in Chinese American women with cancer compared with other populations. Nursing intervention and education for symptom management for this population should address the possible benefits and possible toxic interaction between TCM and conventional therapy. In addition, for cancer survivors, joint pain, fatigue, insomnia, and sexual issues often have been noted to continue well past the time of treatment, particularly with the wide use of aromatase inhibitors to prevent recurrence (Chim et al., 2013; Desai et al., 2013; Frechette et al., 2013; Schmidt et al., 2014). In this study, all participants recalled the use of TCM and symptom distress during active treatment; for future research, examining how many Chinese American cancer survivors use TCM to manage symptoms after active treatment may be beneficial.

Limitations

The study had several limitations. First, the majority of the participants in this study recalled their symptoms and use of TCM in active treatment over a range of months after they had completed cancer treatment. All participants in this study strongly indicated that they were recalling their experiences accurately; many of them told the researcher that they never would forget their chemotherapy treatment. However, recall bias may still threaten the internal validity of the study.

Second, the TCM checklist only included major forms of TCM and did not include all of the TCM types. Third, the study did not examine detailed information about TCM that participants used, such as the amount, frequency, quality of the herbs, and competency of the TCM practitioner. Fourth, the participants in this study, as a convenience sample, may not represent all Chinese American women with cancer in the United States.

Implications for Clinical Practice and Research

In cancer practice and research, symptom research has been the study focus for many years and remains a high priority (Oncology Nursing Society, 2005). High prevalence of psychological symptoms (greater than 70%) for Chinese American women with cancer suggests that oncology nurses should work with mental health providers for symptom management in this population. In a systematic review, TCM was reported to help alleviate unpleasant symptoms associated with cancer and untoward effects of conventional cancer treatments (Smith & Bauer-Wu, 2012). Therefore, oncology nurses need to remain informed of the growing body of evidence on the benefits of TCM for patients with cancer.

TCM has become increasingly popular for all populations, not only in Chinese Americans, but also in patients with cancer in Western countries. However, most contemporary studies of TCM for cancer emanate from China. The small number of studies conducted in the United States limits the possible use of TCM for cancer treatment and symptom management. More studies of TCM use in symptom management are needed to address the needs of patients with cancer. Future studies should include an emphasis on improved methodologies. For example, descriptive studies should examine the detailed information regarding TCM intervention, and intervention studies should use more methodologically rigorous procedures and sampling, such as randomized clinical trials, so stronger conclusions can be drawn.

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