

Research Article

Prevalence, Purposes, and Perceived Effectiveness of Complementary and Alternative Medicine Use in a Hypertension Population: A Questionnaire Survey

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Complementary and alternative medicine (CAM) is widely used among patients with hypertension. This study aimed to determine the use of CAM in community-dwelling individuals with hypertension. A cross-sectional questionnaire survey was administered to 318 hypertension patients to examine prevalence and patterns of CAM use; the use of CAM, specifically for treatment of hypertension or other conditions, and perceived effectiveness of CAM were examined. CAM use in the last 12 months was reported by 236 (74.2%) participants. Only 13.1% of these CAM users reported using CAM to treat hypertension. CAM users did not differ statistically from non-CAM users by age, marital status, health status, duration of hypertension, income, or education. Females showed a significantly higher prevalence of CAM use than that of males (OR 1.82, 95% CI 1.09, 3.11). Family/relatives, doctors, and patients themselves were the three main sources of information about CAM. More than 70% of responses were able to perceive the effectiveness of alternative medical systems, mind-body medicine, and manipulative/body-based therapies. There was a high prevalence of CAM use among hypertension patients, although the majority of CAM use was not specifically for hypertension. Further research is needed to assess the safety and efficacy of diverse CAM.

1. Background

Hypertension is a major public health challenge worldwide because of its high prevalence and concomitant risks of cardiovascular disease [1, 2]. The prevalence of hypertension in China has been rising rapidly during the last 30 years. Recent studies revealed the prevalence of hypertension in people aged 35 and older may reach 30% or more, while the societal response is fragmented with low levels of awareness, treatment, and control [3, 4].

Self-care plays an important role in the management of blood pressure, as recommended by the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) [5]. In recent years, complementary and alternative medicine (CAM) as a form

of self-care has been a growing area of health care, especially in developed countries [6, 7]. The use of CAM has increased significantly in Australia, UK, and the USA over the past decade [8–11]. Some studies have shown a higher prevalence of CAM use among women, persons with greater wealth and higher educational status, and patients with chronic disease [12–15].

Various forms of CAM are available in China, such as tai chi, qigong, traditional Chinese medicine, and acupuncture. These CAMs are widely used by Chinese to promote general health and to treat or prevent medical conditions. The report of WHO Traditional Medicine Strategy 2002–2005 stated that the prevalence of CAM use might be 40% in China [16]. Some of the CAMs such as Tai Chi, Qigong, and traditional Chinese medicine and herbs have been reported to have

beneficial effects on blood pressure [17–19]. A study showed that 14% of those with a history of hypertension reported having used complementary or alternative treatments for their hypertension [20]. However, that study does not include any further information about the complementary or alternative treatments used.

CAM use in hypertension patients has been reported in the USA [21], the UK [22], and Singapore [23], and some other studies have focused on CAM use in patients with cardiovascular disease [24, 25]. According to these reports, there seems to be a high prevalence of CAM use in hypertension patients for treatment of hypertension or other medical conditions. A survey conducted in the USA reported that 69.5% of hypertension patients aged 65 years or older used at least one form of CAM [21]. Most of these studies reported the prevalence of CAM use in hypertension patients and examined the association between CAM use and demographic features. However, few studies reported the perceived effectiveness of, source of information about, and introduction to CAM in hypertension patients [26].

To date, there is little published literature on the use of CAM in hypertension patients in China [16, 20]. Understanding the use of CAM among hypertension patients is important to the safety of public consumption and the integration of CAM treatments into mainstream medicine. It can also provide more information regarding the ways in which hypertension patients cope with blood pressure control. The current study aimed to investigate (1) the prevalence and patterns of CAM use among hypertension patients, (2) the use of CAM specifically for treatment of hypertension or other conditions, and (3) the perceived effectiveness of CAM use.

2. Methods

A face-to-face questionnaire was used to obtain self-report data on CAM use in a hypertension population. This survey was designed to provide some primary data about self-care ability, which is important with regard to further development of intervention programs for self-care. This questionnaire survey was conducted in a local community in Beijing, China.

2.1. Sample Size. The target sample size was 327 individuals, based on the following assumptions: prevalence of CAM use (55%), an allowable error of 10%, a confidence level of 95%, and power of 80%. An assumed 10% dropout rate translated into a target enrollment number of 364 individuals.

2.2. Participants. Details of the study have been reported elsewhere [27]. Eligible participants were aged ≥ 35 years and having hypertension for at least 12 months. Participants who could not communicate effectively with the study personnel or provide informed consent were excluded. During the enrollment period, we confirmed participants' hypertension diagnosis through a medication inventory.

We mainly recruited subjects for this study through a community health center, which is a public medical center

providing medical and public health services to civilians. A total of 890 hypertensive patients were registered in the community health center. Physicians screened the registered patients for eligibility for the study, out of which 143 patients without contact information were excluded. Of the remaining 747 patients, 456 patients met the inclusion criteria and were invited to participate in this study via telephone. As some hypertensive patients may have not attended the health clinic and were not registered, we also recruited subjects through word-of-mouth and put up a poster in the community to create awareness about the study.

Briefly, 523 individuals were invited to participate in the study. Of these, 456 were registered patients. An additional 41 individuals were recruited by referral from study participants who were already recruited, and 26 joined after viewing a poster advertisement in the community. Eligibility was assessed by the physicians at the study sites. After exclusion or drop out from the study, a final study population of 318 patients (289 recruited from registration, 17 from referral, and 12 from the poster advertisement) completed the questionnaire.

2.3. Instruments. The face-to-face questionnaire was structured with inspiration from the National Center for Complementary and Alternative Medicine, literature review, and discussion with public health professionals.

Questions were divided into three domains: sociodemographic characteristics, hypertension-related information, and CAM use. Sociodemographic data included gender, age, educational level (≤ 6 and > 6 years), annual family income ($< 500,000$ and $\geq 500,000$ yuan), and marital status. Hypertension-related questions assessed self-reported type and duration of hypertension and perceived health status (very good, good, fair, poor, and very poor). Questions related to CAM were related to the type of CAM and its use in the past 12 months, whether it was specifically used for hypertension, perceived effectiveness of the CAM, and the source of information about CAM.

The questionnaire also asked about the use of over 20 different CAM therapies within the past 12 months. For these analyses, the therapies were collapsed into five modalities according to the National Center for Complementary and Alternative Medicine and other related literature [21, 22]. The modalities were as follows: alternative medical systems (e.g., traditional Chinese medicine, acupuncture, and cupping), mind-body medicine (e.g., prayer, relaxation, tai Chi, yangge, and qigong), manipulative and body-based methods (e.g., spinal manipulation and massage), natural products (e.g., herbal medicine, probiotics, omega 3s, and fish oil), and vitamin/dietary supplements (e.g., vitamin C, vitamin B/B12, multivitamin, calcium supplements, and other dietary supplements).

2.4. Data Management and Statistical Analysis. Data were double entered and crosschecked using Epi Info, version 6. All statistical analyses were performed using IBM SPSS version 19 (SPSS Inc., Chicago, IL, USA).

TABLE 1: Characteristics of respondents: users and nonusers of CAM.

Characteristics	Total (100%) <i>n</i> = 318	CAM users (74.2%) <i>n</i> = 236	Non-CAM users (25.8%) <i>n</i> = 82	<i>P</i> value
Mean age, years (SD)	62.9 (9.8)	63.0 (9.7)	62.9 (9.9)	0.997
Gender				0.027*
Males	90 (28.3)	59 (25.0)	31 (37.8)	
Females	228 (71.7)	177 (75.0)	51 (62.2)	
Marital status				0.630
Single	6 (1.9)	4 (1.7)	2 (2.4)	
Married/common law	281 (88.4)	207 (87.7)	74 (90.2)	
Widowed/separated/divorced	31 (9.7)	25 (10.6)	6 (7.3)	
Level of education				0.296
≤6 years	222 (69.8)	169 (71.6)	53 (64.6)	
>6 years	96 (30.2)	67 (28.4)	29 (35.4)	
Annual family income				0.600
<50,000 yuan	309 (97.2)	230 (97.5)	79 (96.3)	
≥50,000 yuan	9 (2.8)	6 (2.5)	3 (3.7)	
Self-rated health				0.498
Very good	8 (2.5)	8 (3.4)	0 (0.0)	
Good	71 (22.3)	45 (19.1)	26 (31.7)	
Fair	153 (48.1)	118 (50.0)	35 (42.7)	
Poor	78 (24.5)	59 (25.0)	19 (23.2)	
Very poor	7 (2.2)	5 (2.1)	2 (2.4)	
Mean duration of hypertension diagnosis, years (SD)	8.2 (7.1)	8.2 (7.3)	8.2 (6.5)	0.364

*Statistical significance of difference, $P \leq 0.05$.

Descriptive statistics included sample size, percentages, and means. Differences in demographic and health characteristics between users and nonusers of CAM and differences in CAM modalities between female and male participants were tested using the chi-square test and Fisher's exact test. A logistic regression model was used for the analysis of CAM use with age, gender, duration of hypertension, self-rated health, and annual family income as variables. The significance threshold for all tests was 0.05.

2.5. Ethical Considerations and Treatment. Approval for this study was given by the ethical review board at Waseda University. Informed consent was obtained from all the participants prior to data collection. An information sheet describing the study was available for all participants. The front page of the questionnaire stated that all the data would be kept confidential and that the results would be presented at a group level. Participants were informed that they could stop the interview at any time and decline to answer the questions without giving a reason. At the end of the study, all participants were given a small gift in return for their participation.

3. Results

3.1. Characteristics of Sample. Of the 318 respondents, 228 (71.7%) were female and 90 (28.3%) were male. The mean age

of participants was 62.9 (SD = 9.8) years. An overall statistical description of the CAM users and nonusers ($n = 318$) is shown in Table 1. CAM users did not differ significantly from non-CAM users either by age ($P = 0.997$), marital status ($P = 0.630$), education ($P = 0.296$), income ($P = 0.600$), self-rated health ($P = 0.498$), or duration of hypertension ($P = 0.364$); they differed only by gender ($P = 0.027$).

3.2. Prevalence, Types of Cam Use, and Its Associated Factors. The results showed that 74.2% (236/318) of patients used a form of CAM in the past 12 months; 19.1%, 18.6%, and 36.5% of patients used one type, two types, and more than two types of CAM, respectively. The types and modes of CAM used by participants are presented in Table 2. Few differences were observed when comparing CAM modalities. Only mind-body medicine differed by gender ($P = 0.012$). Traditional Chinese medicine, cupping, relaxation, herbal medicine, and calcium supplements were the most frequently used. Logistic regression analysis using age, gender, duration of hypertension, self-rated health, and annual family income showed a significantly higher prevalence of CAM use in female than in male participants (adjusted OR 1.82, 95% CI 1.09, 3.11).

3.3. Purposes for Using CAM. Approximately 13.1% (31) of the 236 CAM users used CAM specifically to treat their hypertension, accounting for 9.7% of the full sample (318).

TABLE 2: Use of CAM by gender.

	Males (%) <i>n</i> = 90	Females (%) <i>n</i> = 228	Total (%) <i>n</i> = 318	<i>P</i> value
Any CAM use	59 (65.6)	177 (77.6)	236 (74.2)	
Any CAM use, excluding prayer	58 (64.4)	177 (77.6)	235 (73.9)	
Alternative medical systems				0.744
Traditional Chinese medicine	18 (20.0)	58 (25.4)	76 (23.9)	
Acupuncture	5 (0.56)	24 (10.5)	29 (9.1)	
Cupping	19 (21.1)	74 (32.5)	93 (29.2)	
Mind-body medicine				0.012*
Prayer	5 (0.56)	10 (4.4)	15 (4.7)	
Relaxation	31 (34.4)	86 (37.7)	117 (36.8)	
Ta chi	2 (2.2)	1 (0.4)	3 (0.9)	
Qigong	2 (2.2)	3 (1.3)	5 (1.5)	
Yangge	1 (1.1)	32 (14.0)	33 (10.3)	
Manipulative/body based				0.544
Spinal manipulation	2 (2.2)	4 (1.8)	6 (1.9)	
Massage therapy	2 (2.2)	13 (5.7)	15 (4.7)	
Natural products				0.713
Herbal medicine	14 (15.6)	45 (19.7)	59 (18.5)	
Probiotics	2 (2.2)	13 (5.7)	15 (4.7)	
Omega 3s	0 (0.0)	1 (0.4)	1 (0.3)	
Fish oil	2 (2.2)	6 (2.6)	8 (2.5)	
Vitamin/dietary supplements				0.316
Vitamin C	8 (8.9)	20 (8.8)	28 (8.8)	
Vitamin B/B12	4 (4.4)	33 (14.5)	37 (11.6)	
Multivitamins	3 (3.3)	7 (3.1)	10 (3.1)	
Calcium supplements	30 (33.3)	89 (39.0)	119 (37.4)	
Other dietary supplements	4 (4.4)	12 (5.3)	16 (5.0)	

*Statistical Significance of Difference $P \leq 0.05$.

Table 3 showed that major purposes of CAM use as reported by the respondents included treatment for other medical conditions (288/674, 42.7%) and promoting general health (229/674, 34.0%). Only 7.3% (49/674) of total CAM use was reported to be for hypertension treatment. Of those responses, 30.1% cited calcium supplements use for general health. About 32.7% of responses citing hypertension as a purpose mentioned traditional Chinese medicine, and 28.6% mentioned herbal medicine. About 26.0% of responses citing other medical conditions as a purpose mentioned cupping, and 76.3% citing improving mood mentioned relaxation. The use of alternative medical system ($P = 0.002$), mind-body medicine ($P < 0.001$), natural products ($P < 0.001$), and vitamin/dietary supplements ($P = 0.031$) differed in the reported purposes of CAM use.

3.4. Information Sources for CAM. Comparisons of CAM modalities against information sources for CAM are provided in Table 4. There was a statistically significant association between CAM modalities and information sources ($\chi^2 = 81.373, P < 0.001$). Family/relatives, doctors, and patients themselves were the three main information sources for CAM. Specifically, 42.6% of the use of traditional Chinese medicine, herbal medicine, and acupuncture was suggested

by doctors, and 79.7% of the use of cupping, relaxation, and calcium supplements was suggested by family/relatives or just by patients themselves.

3.5. Perceived Effectiveness of CAM. Table 5 presents perceived effectiveness of CAM as per CAM modalities. Perceived effectiveness significantly differed with respect to CAM modality ($\chi^2 = 39.371, P < 0.001$). More than 70% of the respondents were able to perceive the effectiveness of alternative medical systems, mind-body medicine, and manipulative/body-based therapies. According to the responses, traditional Chinese medicine (59.2%), herb medicine (64.9%), cupping (81.5%), massage (86.7%), spinal manipulation (83.3%), and prayer (71.4%) were reported as the most effective CAM.

4. Discussion

Our analyses indicated a higher prevalence of CAM use (74.2%) in the current hypertension population than that in population studies conducted in the USA (69.5%) [21] and UK (43.1%) [22]. Of the 236 CAM users, 13.1% reported using any CAM for treating hypertension, which is higher than the results of the USA study (7.8%) [21]. The prevalence of

TABLE 3: Purposes for which CAM was used[△].

	Purposes of using CAM					P value
	General health	Hypertension treatment	Treatment of other medical conditions	Mood improvement	Other	
Alternative medical systems (<i>n</i> , %)						0.002*
Traditional Chinese medicine	7 (3.1)	16 (32.7)	50 (17.4)	2 (2.2)	1 (9.1)	
Acupuncture	5 (2.2)	0 (0.0)	22 (7.6)	2 (2.2)	0 (0.0)	
Cupping	10 (4.4)	2 (4.1)	75 (26.0)	4 (4.3)	1 (9.1)	
Mind-body medicine (<i>n</i> , %)						<0.001*
Prayer	4 (1.7)	4 (8.2)	1 (0.3)	4 (4.3)	2 (18.2)	
Relaxation	35 (15.3)	5 (10.2)	4 (1.4)	71 (76.3)	0 (0.0)	
Ta chi	2 (0.9)	0 (0.0)	0 (0.0)	1 (1.1)	0 (0.0)	
Qigong	3 (1.3)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	
Yangge	23 (10.0)	0 (0.0)	0 (0.0)	10 (10.8)	0 (0.0)	
Manipulative/body based (<i>n</i> , %)						0.727
Spinal manipulation	3 (1.3)	0 (0.0)	2 (0.7)	1 (1.1)	0 (0.0)	
Massage therapy	7 (3.1)	0 (0.0)	7 (2.4)	1 (1.1)	0 (0.0)	
Natural products (<i>n</i> , %)						<0.001*
Herbal medicine	4 (1.7)	14 (28.6)	39 (13.5)	0 (0.0)	2 (18.2)	
Probiotics	12 (5.2)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	
Omega 3s	1 (0.4)	2 (4.1)	1 (0.3)	0 (0.0)	0 (0.0)	
Fish oil	4 (1.7)	0 (0.0)	0 (0.0)	0 (0.0)	2 (18.2)	
Vitamin/dietary supplements (<i>n</i> , %)						0.031*
Vitamin C	11 (4.8)	1 (2.0)	14 (4.9)	0 (0.0)	2 (18.2)	
Vitamin B/B12	12 (5.2)	2 (4.1)	21 (7.3)	0 (0.0)	1 (9.1)	
Multivitamins	7 (3.1)	0 (0.0)	3 (1.0)	0 (0.0)	0 (0.0)	
Calcium supplements	69 (30.1)	1 (2.0)	45 (15.6)	0 (0.0)	2 (18.2)	
Other dietary supplements	10 (4.4)	2 (4.1)	2 (0.7)	1 (1.1)	0 (0.0)	
Total (<i>n</i>)	229	49	288	97	11	

*Statistical Significance of Difference $P \leq 0.05$.

[△]Multiple responses given.

A total of 674 CAM uses were reported by 236 CAM users.

TABLE 4: Information source for CAM[△].

	Family/relatives	Friends/colleagues	Internet	Book or magazine	Radio or TV	Doctor	CAM user	Patients themselves
Alternative medical systems	54 (27.69)	8 (4.1)	1 (0.51)	0 (0.00)	1 (0.51)	48 (24.62)	2 (1.03)	81 (41.54)
Mind-body medicine	44 (27.50)	15 (9.38)	0 (0.00)	1 (0.63)	6 (3.75)	6 (3.75)	2 (1.25)	86 (53.75)
Manipulative/body based	7 (33.33)	1 (4.76)	0 (0.00)	0 (0.00)	1 (4.76)	3 (14.29)	0 (0.00)	9 (42.86)
Natural products	20 (24.69)	2 (2.47)	0 (0.00)	0 (0.00)	0 (0.00)	33 (40.74)	0 (0.00)	26 (32.10)
Vitamin/dietary supplements	71 (34.30)	13 (6.28)	1 (0.48)	1 (0.48)	7 (3.38)	57 (27.54)	3 (1.45)	54 (26.09)

[△]Multiple responses given.

CAM use for hypertension treatment in our study is similar to that reported from another hypertension study in China [20]. However, the results of these studies are not directly comparable with this study because of differences in the definition of CAM use, study population, and study period.

Previous population studies have shown CAM use to be significantly associated with educational status, gender, wealth, and health status [8, 12–15]. However, no significant differences of income, age, duration of hypertension, education, or health status were observed between CAM and

TABLE 5: Perceived effectiveness of CAM[△].

	Not effective	A little effective	Effective	Very effective
Alternative medical systems	16 (8.12)	45 (22.84)	100 (50.8)	36 (18.27)
Mind-body medicine	11 (6.59)	34 (20.4)	85 (50.9)	37 (22.16)
Manipulative/body based	1 (4.76)	2 (9.52)	15 (71.4)	3 (14.3)
Natural products	13 (16.25)	21 (26.25)	36 (45.00)	10 (12.5)
Vitamin/dietary supplements	40 (19.6)	62 (30.39)	79 (38.73)	23 (11.27)

[△]Multiple responses given.

non-CAM users in the current sample. Similar findings were also reported in other studies about CAM use in patients with chronic diseases [22, 28, 29]. One might speculate that CAM users in the hypertension clinic do not fit the demographic patterns in population studies. However, the definitions of CAM use, study population characteristics, and representation of the samples varied among studies, which may contribute to the difference in the results. Our study results showed that women were more likely to use CAM than men (or 1.82, 95% CI 1.09, 3.11). However, there is conflicting evidence about gender differences in CAM use [22, 28, 29]. These conflicting findings suggest that the association of CAM use with sociodemographic characteristics is complex, requiring further exploration.

Our results revealed that 76.7% of CAM use was for general health (229/674, 34.0%) and other medical conditions (288/674, 42.7%) (Table 3). Only 7.3% of CAM use was reported to be for hypertension treatment. Among the responses reporting use for hypertension treatment, traditional Chinese medicine and herbal medicine constituted 32.7% and 28.6%, respectively. Although prayer and relaxation therapies are usually not recommended as part of treatment for hypertension [22], these were used for hypertension treatment by 10.2% and 8.2% of the participants, respectively. The widespread use of prayer and relaxation in hypertension patients may be because hypertension is often comorbid with depression/anxiety [30]. However, to our knowledge, no study has examined the relationship between relaxation therapy use and depression in hypertension patients. Exploring these associations may help us to understand better the use of prayer and relaxation in hypertension treatment.

The effects of traditional Chinese CAM like qigong, tai chi, and herbal medicine are well recognized by clinicians and the general population [16]. CAM is commonly used by Chinese to promote general health and to treat or prevent medical conditions. To some extent, this can explain why family/relatives, doctors, and patients themselves are the three main information sources for CAM as well as the high level of satisfaction with these CAM.

Our study showed that nearly half of the use of traditional Chinese medicine, herbal medicine, and acupuncture was suggested by doctors, and over three quarters of the use of cupping, relaxation, and calcium supplements was suggested by family/relatives or by the participants themselves. It seems that professional therapies were introduced mainly by doctors. However, common and less professional therapies may be used mainly because of the patients' surroundings.

According to the responses, traditional Chinese medicine (59.2%), herb medicine (64.9%), cupping (81.5%), massage (86.7%), spinal manipulation (83.3%), and prayer (71.4%) were reported as the most effective CAM. Since there is little literature about the perceived effectiveness of CAM use, it is difficult to compare these results with other studies.

5. Limitations

The findings of this study should be interpreted with caution. As the study followed a cross-sectional design, no causal determinants of CAM use can be ascertained. The definition of CAM modalities in this study may differ from other studies, resulting in comparison difficulties. The data in this study were obtained through a self-report questionnaire, and recall bias is inevitable to some extent as participants had to report their use of CAM over the past 12 months. Selection bias may have occurred. Out of the 890 registered patients, 289 participated in this survey. The subjects who agreed to participate may be different from those who did not participate. Notably, 9% of participants were recruited through poster and word-of-mouth from study participants. There may be a limited self-selection bias. There is over representation of females (71.7%) which may lead to bias, especially because females were found to use CAM more than males. It is also important to acknowledge that our study did not reach the projected sample size in the power calculations; this may limit the power of this study. Finally, this study is a community-based survey and cannot represent the national population.

6. Conclusions

This paper is the first survey that fully describes the use of CAM in hypertension patients in China. Given the high prevalence of CAM use in the hypertension population and the poor control of hypertension, it is important to understand the use of CAM as a form of self-care among hypertension patients. So far, there is little information about the use of CAM in the hypertension population in China. Further research is needed to understand better the CAM use in patients with hypertension and other people.

Conflict of Interests

The authors declare that they have no competing interests.

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