Factors influencing the lack of communication on complementary and alternative medicine by clinicians in higher healthcare: A cross-sectional survey in China

Hui Xie (20181064@njucm.edu.cn)
Nanjing University of Chinese Medicine

Hongli Zhou
Liaoning University of Chinese Medicine

Li Li
Nanjing University of Chinese Medicine

Wenting Li
Nanjing University of Chinese Medicine

Haibo Shi
Wuxi Xishan Hospital of Traditional Chinese Medicine

Tianqing Sang
Nanjing University of Chinese Medicine

Haibin Chen
Nanjing University of Chinese Medicine

Hongguang Zhou
Nanjing University of Chinese Medicine

Research Article

Keywords: Clinicians, complementary and alternative medicine, attitude, communication gap, CAM training

Posted Date: December 31st, 2020

DOI: https://doi.org/10.21203/rs.3.rs-138776/v1

Abstract

Purpose

Complementary and alternative medicine (CAM) is well documented and widely applied in healthcare, however, there is a paucity of knowledge on the attitudes of high healthcare clinicians regarding CAM, as well aspects related to the communications by clinicians on the use of CAM. Such communication can be important in assuring agreement about therapeutic plans and the use of CAM as complimentary higher healthcare. The study investigated the communication about CAM between patients and clinicians, as well as factors that influence the communication of clinicians about CAM.

Methods

The study made use of the CAM Health Belief Questionnaire (CHBQ), a 10-item Likert-scale questionnaire that assesses the attitudes and beliefs of healthcare professionals towards CAM. The cross-sectional survey was distributed to 360 doctors in traditional Chinese Mmedicine (TCM) and western medicine (WM) from the departments of Internal Medicine (physicians) and Surgery (surgeons). The survey was distributed in 5 different hospitals in China over the period from May to August 2019.

Results

We found that there is generally a positive attitude toward CAM by clinicians, with a large difference between physicians and surgeons. We found that there was a lack of communication about CAM between clinicians and patients, largely associated with the uncertainty about the scientific evidence for the efficacy of CAM, and the possible interactions with conventional medicine and other safety-related components. This made clinicians fearful and worried, and reluctant to share about CAM. Among those who could share or discuss CAM with patients, many were trained in TCM and had previously used CAM, and so they were more likely to communicate CAM to patients. Western medicine doctors were more resultant and did not have a positive attitude towards CAM, and would not recommend it to patients. Moreover, the physicians who typically would communicate about CAM with patients indicated that they were not encouraged to use it due, largely, to lack of access to CAM training, which is evident in the fact that on 10.6% of the clinicians had certificates in TCM. Therefore, there is a need to train clinicians in CAM and to equip them with skills that will enable them to engage patients and offer complementary modalities of treatment, given the historical use of CAM in China.

Conclusions

Our results show that there is a generally positive attitude towards CAM in higher health in China. Clinicians have a positive attitude towards CAM but do not generally communicate with patients. The willingness that clinicians, especially the western clinicians, want to communicate with patients was weak. To reduce the reluctance and uncertainty, clinicians should be trained in evidence for those CAM methods in which patients are interested. This will also improve doctor-patient communication and allow for better integration of patient needs in their healthcare plans.

Introduction

The concurrent use of complementary and alternative medicines (CAM) along with conventional medicine is growing globally, and patients look to more natural ways of healthcare [1]. According to the World Health Organization (WHO), traditional medicine is the knowledge, skills and theories based on beliefs and experiences of indigenous communities to maintain holistic health dealing with mental and physical wellbeing. In recent years, CAM has become a billion-dollar industry as a result of interest in alternative therapies, especially among patients with chronic illnesses that are not well treated with conventional western medicine. Complementary practices involve the healthcare interventions used alongside traditional medicine and other related therapies that could not be readily found in mainstream healthcare and are considered indispensable in some cultures [1]. Globally, CAM has been commonly employed in countries such as Italy, Germany, Canada, France, and USA, and the proportion of users of CAM treatments ranges from 40 % to 90% [2].

Clinicians may sometimes face with challenges in engaging patients on the use of CAM, particularly in regions where CAM has been used for centuries, typically in developing countries and some developed countries. The attitudes of health care providers about and experiences with CAM vary widely based on geographical location and patient characteristics, and these may influence how clinicians discuss CAM with patients. Recent studies indicate some positive and negative effects of CAM on the treatment of chronic illnesses and other diseases that are difficult to cure. For example, there is a risk of side effects or interaction, such as interactions between phytotherapy and anti-cancer drugs[3, 4]. Some studies mention physicians concern CAM therapies lack of scientific evidence of effectiveness and did not understand the use of CAM[5, 6]. Due to a lack of understanding of CAM and lack of scientific background, clinicians may find it challenging to recommend CAM treatment[7, 8], potentially affecting the doctor-patient relationship where patients look for CAM use in their treatment. These could ultimately have a significant impact on the patient's final treatment plan and compliance.

Studies about different perspectives of the CAM use between oncology professionals and their patients have been conducted in USA, Norway, Japan and Brazil[9-12]. Almost all of the studies have shown that clinicians from different countries have negative opinions on CAM use due to a lack of scientific evidence on its efficacy and interaction of drugs with anti-cancer therapies. Consequently, solving the communication gap regarding the use of CAM was getting more and more attention. In China, only a few surveys on doctors' attitudes and communication towards CAM have been performed[13]. However, the participants were only limited to the oncology department and western medicine physicians. Here, we consider two special situations faced by Chinese patients: First, the Traditional Chinese medicine (TCM) doctor is legally protected in China, as China is one of the nations where TCM is a legal practice. Compared with patients from other countries, Chinese patients seem to have a greater chance of receiving CAM treatments, since this is part of cultural practice as well as a compulsory part of education in medical healthcare. Second, internet access is widely available in China due to the development of e-commerce and smartphones in China in recent years, thus, CAM interest has also been rapidly growing via internet marketing among Chinese patients. To further explore these issues, we surveyed Chinese

doctors to explore their attitudes towards CAM, and opinions about the use of CAM by patients. The goal of this study was to: (1) understand the doctor's attitude towards CAM, (2) quantify the proportion of doctors discussing CAM with patients, and (3) explore reasons that doctors are reluctant to discuss CAM therapies with patients. Understanding these issues could ensure that there is safe and effective integration of CAM with multiple modes of the treatment in a higher health setting.

Methods

Study population

The sample population was clinicians from Wuxi and Nanjing, China. A total of 360 doctors with specialties in traditional Chinese medicine (TCM) and western medicine (WM) from the departments of Internal Medicine (medical oncology, respiratory, gastroenterology, gynecology, endocrinology) and Surgery (orthopedics, gastrointestinal surgery, neurological surgery, urology, obstetrics, surgeons). All participants took part in the study voluntarily, and ethical clearance was approved by the Ethics Committee of Wuxi Xishan District Hospital of Traditional Chinese Medicine. The inclusion and exclusion criteria of doctors are shown in figure 1.

Questionnaire

The questionnaire survey tool for this study was following the CAM Health Belief Questionnaire (CHBQ) Survey, aimed at assessing the attitudes and beliefs of healthcare professionals towards complementary and alternative medicine (CAM). The CHBQ was validated and developed for physicians and has been widely used in studies assessing physicians' attitudes about CAM[14-17]. It is a self-administered questionnaire, and for this study, it was paper-based. A pilot study was conducted with a subset of the target population (20 clinicians) to assess the comprehension and readability of the questions. Relevant adjustments were made to some questions based on the outcome of the pilot study. The aspects evaluating the CAM communication and influencing factors were based on the previous research [5, 18-20]. Some options in the questionnaire allowed the participants to select multiple responses to a single question.

Data analysis

All data obtained were analyzed by SPSS Windows Software version 20.0 after being incorporated into a Microsoft Excel spreadsheet. Means and standard deviations were used to describe continuous variables such as Likert scale questions. Chi-square tests and Man Whitney *U* test were used to measure the differences between the participants' responses. Statistical significance was accepted at P values of less than 0.05.

1. **Demographic information**

A total of 360 questionnaires were distributed among the doctors who participated in this study, and 329 questionnaires were returned with complete information, with a response rate of 91.4%. The demographic

profile of the participants in this study is shown in Table 1. A large proportion of the participants was female 228 (69.3%), and the majority aged between 30 and 50 years old (44%) with a mean age of 38.40±1.85 years. Most of the 329 respondents (63.8%, n =210) worked in the internal medicine department and 119 (36.2%) in the surgery department; mostly practiced in WM (89.4%), and only a minority in TCM (10.6%).

Table 1 Characteristics of clinicians

		Number	%
category	Who had a western medical license of clinical medicine (WMs)	294	89.4
	Who had a Traditional Chinese medicine license (TCMs)	35	10.6
Gender	Males	101	30.7
	Females	228	69.3
Age (years)	30	102	31
	≥30 50	178	54.1
	50 ≤70	49	14.9
Department	Internal medicine	210	63.8
	surgery	119	36.2
Years of Working	5	81	24.6
	≥5 10	132	40.1
	≥10 20	64	19.5
	≥20	52	15.8
Academic qualification	Medical degree or below	194	59
	Master's degree or over	135	41

2. **Perceptions and attitudes about CAM**

Clinicians generally showed a positive attitude towards CAM (Figure 2). The majority (76%) of the clinicians did not find CAM to be a threat to public health, and more than half (51.1%) agreed that physical and mental health is maintained by underlying energy or vital force. When asked whether substances not tested by scientifically approved methods should be banned, there was a 50/50 split in those who agreed and disagree (35.5% agreed, 35.8% disagreed). We found that WM doctors tended to believe more strongly that the use of CAM therapies which have not been scientifically tested should be discouraged than TCM doctors (Chi-square = 7.47 n=329 p<.05). Over 60% of the participants disagreed that CAM is a placebo, while males generally tend to agree that the patient's expectations, health beliefs

and values should be incorporated into the patient care process than females (Chi-square = 19.5 n=329 p<.05)

3. **CHBQ score outcomes**

The CAM Health Belief Questionnaire (CHBQ) was 46.53±10.8, above the average score of 35, indicating a positive attitude towards CAM by participating doctors in this study. The attitude towards CAM was influenced by several factors including category, gender, department, academic qualification, self-application, and familiarity. Clinicians with practicing in TCMs had a positive attitude towards CAM than WM clinicians (*U* test p<.001). The positive attitude was associated with higher academic qualification (*U* test p=0.002), and mostly for males and physicians. The majority of the participants (77.5%) reported using at least one form of CAM in past years, but only 33.1% had communicated with patients about CAM in the past one week. Those who have used CAM treatments had a more positive attitude than those who never did (*U* test p=0.002), and similarly, those who communicated about CAM with patients had a more positive attitude than those who did not (*U* test p<.001). The age of the respondents and the number of year in practice had no effect on the attitude of the participants towards CAM. (Table 2)

Table 2 CHBQ score

		CHBQ score (Mean ± SD)	*p*
Category	Qualification certificate of TCM	52.2±7.7	0.001
	Qualification certificate of Western medicine	45.8±11	
Gender	female	45.3±11	0.004
	male	49.1±10	
Age	40years	46.2±10.7	0.137
	≥40years	48.6±11.6	
Department	Internal medicine	48.6±10	0.001
	surgery	42±11	
Years of Working	10	46.7±10.4	0.617
	≥10	46±12	
Academic qualification	Medical degree	44.9±11.1	0.002
	Master's degree or above	48.7±10.1	
Self-application	No22.5%	43.5±9	0.002
	Yes77.5%	47.4±11	
Talking with patients in the past one week	No66.9%	44±10	0.001
	Yes33.1%	51±11	

4. **Characteristics of clinicians and communication about CAM**

We found a strong association between the clinician characteristics and their likelihood to talk about CAM to the patient (Table 3). The clinicians who practiced in TCM discussed CAM with their patients significantly more than WM doctors did in the past week (94.2% vs 25.5%, Chi-square = 67.1 P<.001). Physician also communicated significantly more on CAM with their patients compared to surgeons (49.5% vs 7.6%, Chi-square = 53.9 n=329 P<.001). The increased odds in communicating about CAM with patients were influenced by the experience of the clinician with CAM. Previous use of CAM in the past years significantly increased the likelihood of communication with patients about CAM (38.8% vs 12.1%, Chi-square = 27.5 n=329 p<0.001). Further, the clinicians with higher degrees (Masters degree and above) were more likely to communicate with patients about CAM than the others (48.1%, vs22.1%, Chi-square = 24.3 n=329 p<.001).

Table 3 Characteristics of clinicians and communication about CAM

		The number of doctors who have talked about CAM with their patients in the past one week	*p*
Category	WMs	75(25.5)	.001
	TCMs	33(94.2)	
Gender	male	42(41.6)	P=.03
	female	66(28.9)	
Department	Internal medicine	99(49.5)	.001
	surgery	9(7.6)	
Academic qualification	Medical degree	43(22.1)	.001
	Master's degree or above	65(48.1)	
Self-application	No	9(12.1)	.001
	Yes	99(38.8)	

Chi-square tests

5. **Communications of CAM between clinicians and patients.**

Participants generally are discomfort towards sharing or communicating about CAM with their patients. When asked “How many times did you initiate the conversations about CAM in the past a week?” many indicated less than 3 times (80.3%) or between 3-6 times (21.9%). In addition, many of the doctors indicated that they felt neutral (28.1%) or somewhat uncomfortable (38%) discussing CAM with patients. When asked “What is your reaction towards patients’ question about the availability of CAM?”, most (38.8%) reported they could encourage patients to use CAM, and they typically communicate with patients about CAM modalities, mainly TCM therapy (77.2%), followed by acupuncture (60.2%), massage (52%), and nutrition (45%). Further, when asked “what is the level or main source of knowledge on CAM?”, most doctors had at least taken a course (67.5%), while 22.3% of the doctors were familiar with CAM but had not taken any coursework or formal training, although 10.6% clinicians had a CAM degree or certification. Table 4

Table 4 Distribution of answers provided by clinicians: The Response of clinicians associated with CAM asking.

How many times did you initiate the conversations about CAM in the past a week	percentages
3times	80.3
3-6times	21.9
6times	7.8
Do you feel comfortable talking about CAM	
Very Uncomfortable	2.9
Somewhat Uncomfortable	17.0
Neutral	28.1
Somewhat Comfortable	38
Very Comfortable	14
What is your reaction patients ask if CAM is available?	
Discourage	25.2
encourage	38.8
Neutral	36
What is your level/ main source of knowledge on CAM?	
Completely unfamiliar	16
Familiar but no education or training	22.3
Attended conferences where CAM was discussed	7.4
Taken CAM courses	67.5
I have a CAM degree or certification	10.6
Types of CAM that want to talk about with patients	
TCM	77.2
Nutrition	45
Spirituality / Prayer	24
Acupuncture	60.2
Massage	52
Tai Chi	39.5
Yoga	34.1
Homeopathy	2.4

Naturopathy	15.8
Ayurvedic	3.1

6. **Factors influencing doctors' willingness to discuss CAM with their patients**

Overall, the lack of training in CAM in higher health doctors influenced their ability or comfort to discuss CAM with patients (Figure 3). 38.5% of the participants indicated that the lack of communication with patients about the use of CAM was because of the lack of training. Others associated it with the lack of adequate scientific evidence to show support for the effectiveness of the CAM therapies, and were worried and fearful about its impact on the effectiveness of conventional drugs. The financial burden on patients or time constraints were not considered as a barrier for the lack of communication around CAM therapies.

Discussion

In recent year, the use of CAM has taken center stage with a wealth of evidence showing its sudden resurgence. It is not surprising that since over 80% of the population in developing countries still relies on CAM, half number of people in the developed counties use CAM[16]. Typically, the general view of CAM is that it is a supportive and holistic type of therapy that enhances overall health. That said, there are variations in its use across countries. Furthermore, its use in higher health and perceptions of its use in higher health have been a key area of interest, as patients may want to combine the use of CAM with more conventional treatments. In this study, we aimed to understand the perceptions of clinicians in higher health on CAM and the factors influencing their communication of CAM use with their patients in higher health settings. We found that a large proportion of the clinicians in this study had a positive attitude towards CAM and felt that it is important in patient care; however, they did not communicate about CAM with their patients. They found it uncomfortable to do so and provided several reasons for the lack of communication which included lack of adequate training, poor scientific evidence to prove the efficacy of CAM treatments and worried whether it would interact negatively with conventional medicines. Moreover, it appears that those who had previous experience of CAM use were more comfortable to communicate, and those who had a higher degree (more skills and knowledge) appeared to easily communicate about the use of CAM with their patients. Surprisingly, males showed a stronger positive outlook in the attitude towards CAM. Further, there were differences between physicians and surgeons, where physicians were more likely to recommend or communicate about CAM with their patients. Because of the role they play, physicians may be more likely to communicate CAM therapies as part of holistic care.

In China, TCM is the dominant form of CAM. National Health Commission emphasizes the combination of traditional Chinese and western medicine. Therefore, it not surprising that over three-fourths (76%) of doctors disagreed that CAM was a threat to public health. Furthermore, more than half (52.3%) doctors think that CAM is beneficial, which was also not surprising since CHBQ score of Chinese clinicians was higher than in other countries. The clinicians who had certification in TCM had a positive attitude towards

CAM more than WM clinicians. These were found to be similar in other countries including Kuwait[21], and Malaysia[22]. Further, physicians and surgeons differed in their attitude towards CAM, with physicians having a positive attitude towards CAM. When looking at the participant profile, the majority of surgeons held a WM certificate or license while physicians held a TCM certificate or license. This is important since those who held a TCM license were most likely to communicate with patients about CAM, and often had experience in the use of CAM. CAM may not be relevant to surgical treatment, because the surgical treatment is still dominated by western medicine[23].

We found that Chinese doctors have a positive attitude towards CAM and feel that complementary therapies could benefit from the integration of CAM. However, we show in this study that there is a general tendency to discourage the communication about CAM use, especially among the doctors who practice WM. A similar result was found in a survey conducted among oncologists in Shanghai who discourage communication about CAM[13]. In these instances, WM practitioners required scientific background to support the effectiveness of CAM before they could trust it. This was found in another study where the lack of scientific evidence on efficacy discouraged the clinician from communication about CAM use with patients[5]. In China, CAM courses are compulsory, however, in our sample population, the WM practitioners had little training and did not take enough courses in CAM[24]. As a result, they are not familiar with CAM therapies and could not be in a position to advice patients on the use of CAM. Further, the increase in the number of negative reports on the failures of CAM is adding to the fear and reluctance in sharing or communicating about CAM use with patients [25-28].

Interestingly, the age of the patient and the potential financial burden were not found to be important when communicating about CAM with patients; instead, clinicians have no such worries due to a high coverage of insurance on CAM[29]. Clinicians who suggested CAM or communicated about it with patients typically recommended the following modalities, TCM, acupuncture, massage and nutrition, since these have been the popular treatments in Chinese culture since ancient times. This was found to be the same in other studies, where massage and herbal medicine were the most recommended CAM[30].

Our study indicates that there is a positive attitude towards CAM and that there is a potential to incorporate it into complementary medicine in higher health. However, there are challenges regarding the negative perceptions on the scientific evidence for support for CAM use, as well as the lack of training evidence among the majority of clinicians practicing in WM. Therefore, it is essential to improve the training for clinicians to ensure patients' safety and improve patient care[31-34]. In particular, improvements in CAM training may help relieve doctors' discomfort related to answering questions about CAM. Although the Chinese health management department emphasizes the policy of integrating Chinese and western medicine, surgeons may feel less comfortable than physicians about initiating discussions about CAM. This finding opens the possibility of training and self-application-specific interventions. Therefore, more research should focus on understanding how to increase the rates of CAM discussion and on designing interventions to improve patients' satisfaction with communication[35].

Limitations

Our research has several limitations: It is a cross-sectional study design, and the factors affecting doctors' response cannot be studied over time. This survey was based on self-reported data, so recall bias might have affected the results. Many participants were not familiar with CAM, which might have affected some of the results. Moreover, the results of this survey only represent the opinions of participants in Wuxi and Nanjing, which cannot be generalized to other cities of China.

Conclusion

Although clinicians have a good attitude towards CAM, they are reluctant to talk about CAM usage with patients for a variety of reasons including safety and scientific evidence for efficacy and lack of training in CAM. We suggest that clinicians actively initiate a discussion with their patients about CAM use, while at the same time, attaining professional training on CAM which should be provided to all clinicians to effective and safe use of CAM for their patients.

Abbreviations

CAM Complementary and alternative medicine

CHBQ CAM Health Belief Questionnaire

TCM Traditional Chinese Mmedicine

WM Western medicine

Declarations

Funding

1. National Natural Science Foundation of China (81973737);

2. A Project Funded by the Priority Academic Program Development of Jiangsu Higher Education Institutions (PAPD);

3. The Open Projects of the Discipline of Chinese Medicine of Nanjing University of Chinese Medicine Supported by the Subject of Academic priority discipline of Jiangsu Higher Education Institutions(ZYX03JG002; ZYX03KF003).

4. The project of Jiangsu Graduates Training Innovation in 2020(KYCX_201551)

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Ethics declarations

The Ethical committee deemed that a procedure where we asked clinicians in higher healthcare for oral consent before they produced anonymous questionnaire information and allowed using anonymized clinicians record information was acceptable in this study.

Authors' Contributions

H.X and H.l.Z conceived and designed the study. L.l, Wt.l, Hb.S and Tq.S collected and analyzed the data. Hb.C contributed to the interpretation of the data. Hb.C and Hg.Z critically reviewed the manuscript and assisted in the final write-up of the manuscript. All authors read and approved the final manuscript.

Contributor Information

Hui Xie: 20181064@njucm.edu.cn

Hongli Zhou: zhouhongli946845@163.com

Li Li:260585@njucm.edu.cn

Wenting Li: 260729@njucm.edu.cn

Haibo Shi shihaibo0806@163.com

Tianqing Sang:20181062@njucm.edu.cn

Haibin Chen:150952@njucm.edu.cn

Hongguang Zhou: 260105@njucm.edu.cn

Associated Data

The data used to support the findings of this study can be obtained from the corresponding author.

References

1. James, P.B. and A.J. Bah, *Awareness, use, attitude and perceived need for Complementary and Alternative Medicine (CAM) education among undergraduate pharmacy students in Sierra Leone: a descriptive cross-sectional survey.* BMC Complement Altern Med, 2014. **14**: p. 438.
2. Barnes, P.M., B. Bloom, and R.L. Nahin, *Complementary and alternative medicine use among adults and children: United States, 2007.* Natl Health Stat Report, 2008(12): p. 1-23.
3. Colalto, C., *Herbal interactions on absorption of drugs: Mechanisms of action and clinical risk assessment.* Pharmacol Res, 2010. **62**(3): p. 207-27.
4. Shord, S.S., K. Shah, and A. Lukose, *Drug-botanical interactions: a review of the laboratory, animal, and human data for 8 common botanicals.* Integr Cancer Ther, 2009. **8**(3): p. 208-27.

5. Shelley, B.M., et al., *'They don't ask me so I don't tell them': patient-clinician communication about traditional, complementary, and alternative medicine.* Ann Fam Med, 2009. **7**(2): p. 139-47.
6. Kim, D.Y., et al., *Discrepant views of Korean medical oncologists and cancer patients on complementary and alternative medicine.* Cancer Res Treat, 2008. **40**(2): p. 87-92.
7. Kundu, A., et al., *Attitudes, patterns of recommendation, and communication of pediatric providers about complementary and alternative medicine in a large metropolitan children's hospital.* Clin Pediatr (Phila), 2011. **50**(2): p. 153-8.
8. Fountain-Polley, S., et al., *Knowledge and exposure to complementary and alternative medicine in paediatric doctors: a questionnaire survey.* BMC Complement Altern Med, 2007. **7**: p. 38.
9. Tasaki, K., et al., *Communication between physicians and cancer patients about complementary and alternative medicine: exploring patients' perspectives.* Psychooncology, 2002. **11**(3): p. 212-20.
10. Risberg, T., et al., *Knowledge of and attitudes toward complementary and alternative therapies; a national multicentre study of oncology professionals in Norway.* Eur J Cancer, 2004. **40**(4): p. 529-35.
11. Hyodo, I., et al., *Perceptions and attitudes of clinical oncologists on complementary and alternative medicine: a nationwide survey in Japan.* Cancer, 2003. **97**(11): p. 2861-8.
12. Samano, E.S., et al., *Use of complementary and alternative medicine by Brazilian oncologists.* Eur J Cancer Care (Engl), 2005. **14**(2): p. 143-8.
13. Yang, G., et al., *Discrepant Views of Oncologists and Cancer Patients on Complementary and Alternative Medicine in a Chinese General Hospital.* Integr Cancer Ther, 2018. **17**(2): p. 451-457.
14. Lie, D. and J. Boker, *Development and validation of the CAM Health Belief Questionnaire (CHBQ) and CAM use and attitudes amongst medical students.* BMC Med Educ, 2004. **4**: p. 2.
15. Walker, B.F., et al., *Knowledge, attitude, influences and use of complementary and alternative medicine (CAM) among chiropractic and nursing students.* Chiropr Man Therap, 2017. **25**: p. 29.
16. Ashraf, M., et al., *A cross-sectional assessment of knowledge, attitudes and self-perceived effectiveness of complementary and alternative medicine among pharmacy and non-pharmacy university students.* BMC Complement Altern Med, 2019. **19**(1): p. 95.
17. Bjerså, K., E. Stener Victorin, and M. Fagevik Olsén, *Knowledge about complementary, alternative and integrative medicine (CAM) among registered health care providers in Swedish surgical care: a national survey among university hospitals.* BMC Complement Altern Med, 2012. **12**: p. 42.
18. Smith, K.R., *Factors influencing the inclusion of complementary and alternative medicine (CAM) in undergraduate medical education.* BMJ Open, 2011. **1**(1): p. e000074.
19. Bahall, M. and G. Legall, *Knowledge, attitudes, and practices among health care providers regarding complementary and alternative medicine in Trinidad and Tobago.* BMC Complement Altern Med, 2017. **17**(1): p. 144.
20. Jarvis, A., et al., *General practitioners' beliefs about the clinical utility of complementary and alternative medicine.* Prim Health Care Res Dev, 2015. **16**(3): p. 246-53.

21. Majeed, K., et al., *Complementary and Alternative Medicine: Perceptions of Medical Students from Pakistan.* Med Educ Online, 2007. **12**(1): p. 4469.
22. Hasan, S.S., et al., *Understanding, perceptions and self-use of complementary and alternative medicine (CAM) among Malaysian pharmacy students.* BMC Complement Altern Med, 2011. **11**: p. 95.
23. Samara, A.M., et al., *Use and acceptance of complementary and alternative medicine among medical students: a cross sectional study from Palestine.* BMC Complement Altern Med, 2019. **19**(1): p. 78.
24. Xie, H., et al., *A Survey on Perceptions of Complementary and Alternative Medicine among Undergraduates in China.* Evid Based Complement Alternat Med, 2020. **2020**: p. 9091051.
25. Liu, S.H., et al., *Safety surveillance of traditional Chinese medicine: current and future.* Drug Saf, 2015. **38**(2): p. 117-28.
26. Yang, B., et al., *Nephrotoxicity and Chinese Herbal Medicine.* Clin J Am Soc Nephrol, 2018. **13**(10): p. 1605-1611.
27. Debelle, F.D., J.L. Vanherweghem, and J.L. Nortier, *Aristolochic acid nephropathy: a worldwide problem.* Kidney Int, 2008. **74**(2): p. 158-69.
28. Peng, F., et al., *Aconitine induces cardiomyocyte damage by mitigating BNIP3-dependent mitophagy and the TNFα-NLRP3 signalling axis.* Cell Prolif, 2020. **53**(1): p. e12701.
29. Chen, W., E.C. Li, and W.R. Zheng, *Policies on Chinese Medicine in China May Have Enlightenments to Complementary and Alternative Medicine in the World.* Chin J Integr Med, 2018. **24**(10): p. 789-793.
30. Sawni, A. and R. Thomas, *Pediatricians' attitudes, experience and referral patterns regarding Complementary/Alternative Medicine: a national survey.* BMC Complement Altern Med, 2007. **7**: p. 18.
31. Gardiner, P., et al., *Family medicine residency program directors attitudes and knowledge of family medicine CAM competencies.* Explore (NY), 2013. **9**(5): p. 299-307.
32. Lebensohn, P., et al., *Integrative medicine in residency education: developing competency through online curriculum training.* J Grad Med Educ, 2012. **4**(1): p. 76-82.
33. Kemper, K.J., E.C. Vincent, and J.N. Scardapane, *Teaching an integrated approach to complementary, alternative, and mainstream therapies for children: a curriculum evaluation.* J Altern Complement Med, 1999. **5**(3): p. 261-8.
34. Milan, F.B., et al., *Teaching residents about complementary and alternative medicine in the United States.* J Gen Intern Med, 1998. **13**(8): p. 562-7.
35. Ge, J., et al., *Patient-physician communication about complementary and alternative medicine in a radiation oncology setting.* Int J Radiat Oncol Biol Phys, 2013. **85**(1): p. e1-6.

Figures

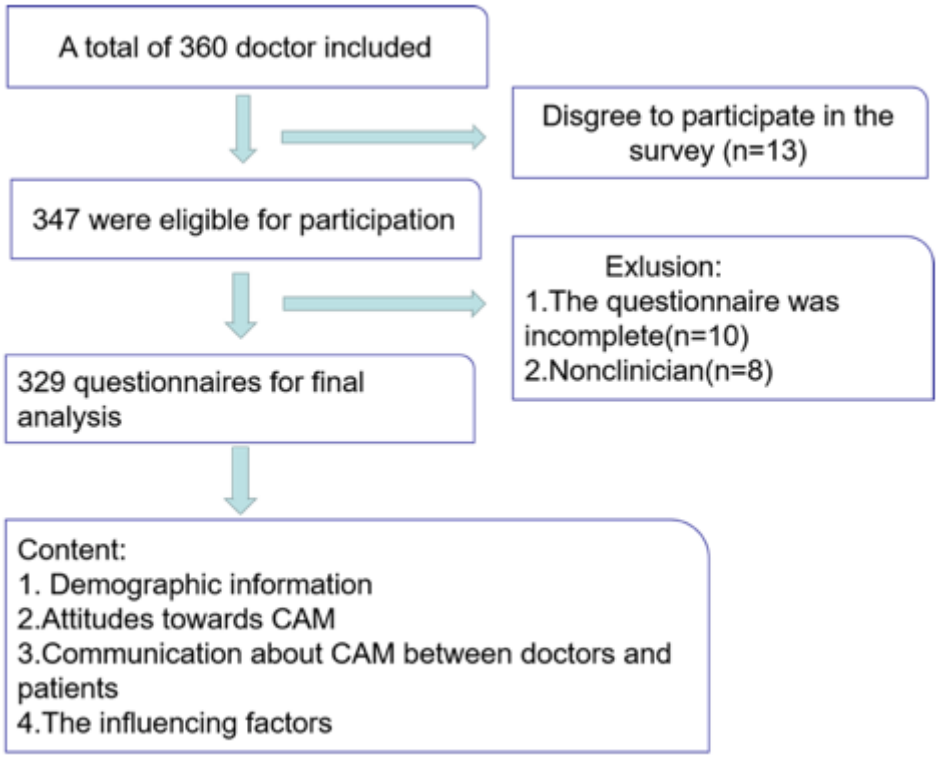

Figure 1

Flowchart of selecting study population

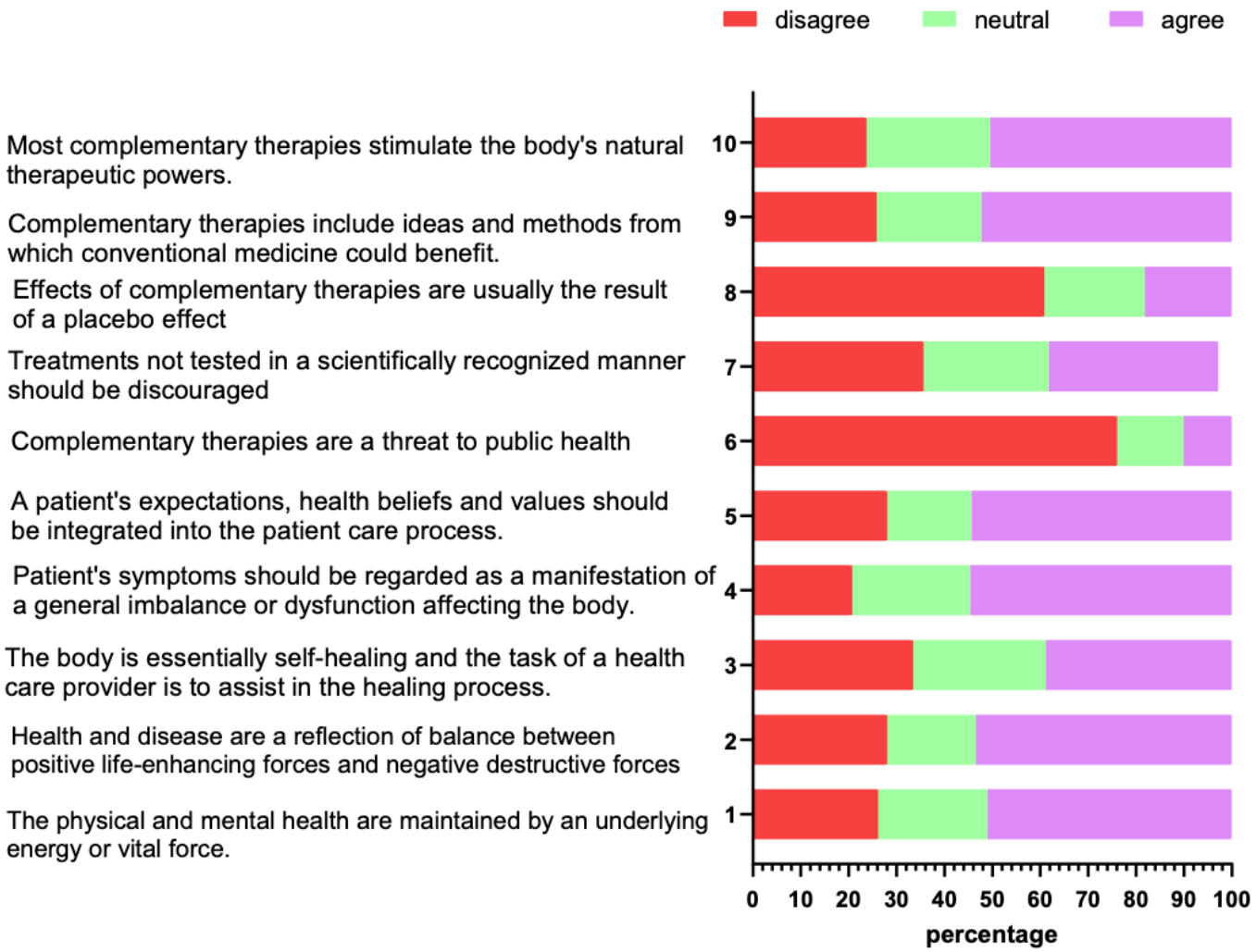

Figure 2

Perceptions and attitudes about CAM

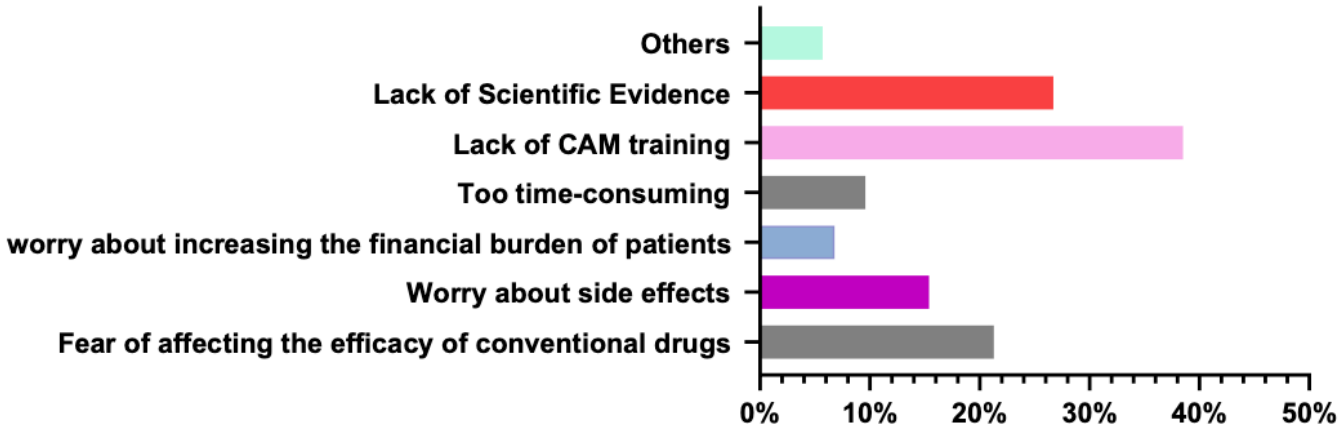

Figure 3

The lack of training in CAM in higher health doctors influenced their ability or comfort to discuss CAM with patients