上海中醫藥大學 Shanghai University of Traditional Chinese Medicine
中華中醫藥學會 China Association of Chinese Medicine
中国科技期刊卓越行动计划高起点新刊
ISSN 2589-9627
CN 31-2178/R9

Chinese Medicine and Culture 中医药文化

Volume 5 • Issue 4 • December 2022
https://journal.lww.com/cmc

Wolters Kluwer

Chinese Medicine and Culture

中医药文化

Special Issue: Traditional Chinese Medicine in North America

Guest Editor-in-Chief: Yemeng Chen

Yemeng Chen, Ph.D., L.Ac., is President of New York College of Traditional Chinese Medicine, President of National Federation of Chinese TCM Organizations, Honorary President of Young Acupuncturists Association of America, and Vice President of World Traditional Medicine Forum. He serves as Editor-in-Chief of *Journal of Complementary Medicine & Alternative Healthcare* and International Executive Editor of *Chinese Medicine and Culture*. Dr. Chen is also a guest professor in Chinese medicine universities of Beijing, Shanghai, and Jiangxi, as well as Academy of Integrative Medicine in Fudan University. He was Chair of Accreditation Commission for Acupuncture & Oriental Medicine and Vice-Chair of the New York State Board for Acupuncture. He once worked as an instructor in the former Shanghai Medical University — now known as Fudan University — and practiced as a physician in its affiliated Huashan Hospital. During his time at the hospital, he received extensive clinical experience through his mentor, a well-known Prof. You-An Fang, who is now on the Shanghai Municipal Government Intangible Cultural Inheritage List.

Besides publishing over 60 research papers, Dr. Chen also published many books such as *The Effectiveness of Acupuncture Treatment on Various Diseases* (1990) and *Guide of Consulting Acupuncture* (1994). In 1992, he participated in writing two large-scale reference works: *New Edition of Chinese Acupuncture & Moxibustion* and *Complete Works of Chinese Acupuncture & Moxibustion*. He was also a co-author of *Diversification of Acupuncture Practice in the U.S.* (2016), *Nutrition & Integrative Medicine: A Primer for Clinicians* (2018), and *Overview of World Chinese Medicine Education* (2019). He was a Deputy Editor-in-Chief and Chief Translator in English Edition of *Diagnostics in Chinese Medicine*, World Textbook Series for Chinese Medicine Core Curriculum (2019), and one of Editor-in-Chief of *Chinese Medicine Diagnostics*, English Textbook Series of Beijing University of Chinese Medicine (2019). Dr. Chen was a reviewer of ICD-11 TM Codes and Standard Terminology of Traditional Chinese Medicine invited by World Health Organization.

New York College of Traditional Chinese Medicine

Established in 1996 and located in Long Island, New York College of Traditional Chinese Medicine offers the fully-accredited three-year Master of Science in Acupuncture Program and four-year Master of Science in Acupuncture with Chinese Herbal Medicine Program. Graduates of these programs are eligible for certification examinations, li censure, and professional practice within New York State and much of the U.S. The college prepares compassionate practitioners who are solidly grounded in the tradition of Chinese medicine, who are able to integrate this tradition within the Western health care system, and who have a spirit of innovation that empowers them to adapt a 4000-year-old medicine to 21st-century needs.

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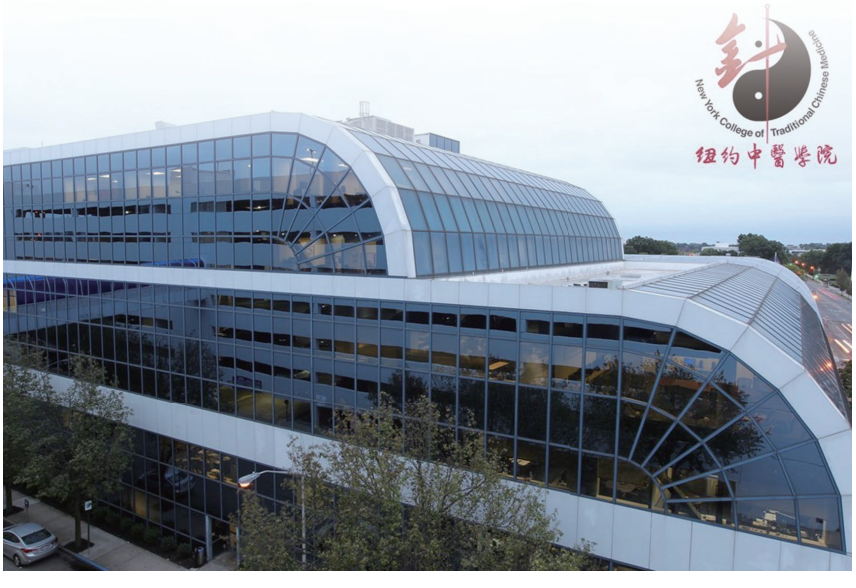

Chinese Medicine and Culture

中医药文化 Established in 2018 Quarterly

Chinese Medicine and Culture

中医药文化

General Information

AIMS AND SCOPE

Chinese Medicine and Culture is an interdisciplinary academic journal focusing on the study of Chinese medicine. It aims to promote communication and dialogue between researchers in the natural sciences and humanities of Chinese medicine. The objectives are to build an interactive platform for interdisciplinary research on Chinese medicine and to comprehensively reflect the high-level and latest research results of Chinese medicine in the fields of medical science research, cultural exchange and historical heritage conservation.

INDEXED BY

Scopus (Netherland), DOAJ (Sweden), Ulrichs (US), Ovid (US), Ex Libris-Primo Central (Israel), EBSCO Publishing's Electronic Databases (US), Baidu Scholar (China), CNKI (China), Wanfang Data (China), Google Scholar (US), Hinari (Switzerland), Infotrieve (France), Netherlands ISSN Center (France), ProQuest (US), and TdNet (Isreal), CSTJ (China).

ADMINISTERED BY

Shanghai Municipal Education Commission

SPONSORED BY

Shanghai University of Traditional Chinese Medicine
China Association of Chinese Medicine

JOINTLY PUBLISHED BY

Shanghai University of Traditional Chinese Medicine
Wolters Kluwer Health, Inc.

PRINTED BY

Business Book Printing Shop Shanghai Printing CO., LTD

SUBSCRIPTION

Editorial Office of Chinese Medicine and Culture

FREQUENCY

Quarterly

LAUNCH DATE

July 03, 2018

CURRENT PUBLICATION DATE

December 30, 2022

SPECIAL STATEMENT

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CN: 31-2178/R9
ISSN: 2589-9627
Official Website: https://journals.lww.com/cmc/
Submission Website: https://www.editorialmanager.com/cmc/

Chinese Medicine and Culture

Volume 5 ¦ Issue 4 ¦ December 2022

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Editorial

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Overview of the Development of Chinese Medicine in North America

Ye-Meng Chen✉

1 Introduction

The world is now in an era of the globalization of traditional Chinese medicine (TCM).

A hundred and thirty-three member states responded in the World Health Organization's (WHO) Global Report on Traditional & Complementary Medicine 2019, which was based on the second WHO global survey in 2012, 113 member states formally acknowledged that their population uses acupuncture and 100 member states acknowledged that they use TCM.[1] The data in this report also showed that 30 member states have regulations on acupuncture and 18 member states on TCM. In the category of traditional and complementary medicine, acupuncture is the most common form of practice in the world. In 2022, the International Classification of Diseases 11th Revision (ICD-11) is officially in effect.[2–4] Chapter 26, Traditional Medicine, was first forever published in this international standard of diseases classification and the technical terms mostly compiled from TCM which indicated that TCM is now officially entering the world health system.

Overseas TCM is rapidly growing in North America. Even though Chinese herbal medicine disseminated into the American continent in the middle of the 19th century,[5] its development as a profession did not start until half a century ago. The grass root welcome and acceptance of Chinese medicine has made for successful lobbying efforts towards legislation that allows the legal practice of Chinese medicine, mainly passed acupuncture practice acts in the United States, so acupuncture practice is dominant among the modalities of Chinese medicine. North America has the largest number of Chinese medicine practitioners outside of Chinese mainland, about 38,000 licensed acupuncturists in the United States[6] and over 6,000 practitioners of acupuncture and TCM in five provinces that can legally practice in Canada.[7,8] Along with the development of the acupuncture and Chinese herbal medicine profession continues to grow, corresponding regulations, education, and insurance accessibility are gradually increasing. Since 2020, acupuncture treatment can be reimbursed for low back pain through Medicare in the United States.[9] Acupuncture is well accepted by the population in North America which is far beyond the Chinese community.

This special issue of *Chinese Medicine and Culture* has published eight articles covering different aspects of the developmental status of acupuncture and Chinese herbal medicine in legislation, education, clinical practice, and academia (such as cultural integration study). In this highlight, a brief overview is provided for the main contents of these newly researched outcomes.

2 Summary of Chinese medicine in North America in this special issue

Medicine operates within the world views of the culture that it serves, and the widespread Chinese diaspora has carried medical practices with it. The resulting creolization takes shape at the borders of intersecting cultures in a distinct form of integration. Exploring the intersections of the integral relative to the spread of Chinese medicine in the West and North America and practical, cognitive, and theoretical terms is useful for practitioners, academics, and policymakers in the areas of integrative and Chinese medicine.

With the adoption of multiculturalism in Canada, our health care system has incorporated TCM and acupuncture into medical services and having these approaches along with Western scientific–based medical practice has improved patient care. Generally, alternative medicines rely on organic and natural products, have holistic practices, and include a different inclusive way of thinking. Other factors such as the rising cost of medical expenses and the high cost of pharmaceutical products and respect for Chinese cultural practices affected the growth of alternative approaches in Canada.

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Chinese Medicine and Culture (2022) 5:4

Received: 29 October 2022; accepted: 31 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000038

The practice of TCM of the Chinese-speaking immigrants residing in BC, Canada, is evident by this qualitative research project. Integrating TCM with medical practices in the West, "cultural capital" could be established through expanding choices for health and disease management if the options for each are available.[10] Integrating TCM into Western medical practices could diversify the spectrum of services available for all Canadians. A set of congruent behaviors, attitudes, and policies need to come together in a system, agency, or among professionals and enable them to work effectively in cross-cultural situations.[11,12]

Both "academic societies" and "professional associations" should be the organizations that serve the best interests of their industry. TCM organizations should actively serve the legislation and promote the development of the Chinese medicine profession, and TCM practitioners should have more dedication to the advancement of their profession. For an example of acupuncture legislation in Virginia, US, dedication and strategy are the important factors leading to success.

Through the investigation and analysis of the two typical and most representative Chinese medicine schools in the eastern United States, the current situation of Chinese medicine education in the United States is discussed. Chinese medicine education, especially acupuncture education, in the United States has entered the localization development. It is foreseeable that with the joint efforts of local Chinese medicine practitioners to promote legislation and education standards, the development of Chinese medicine in the United States will have a bright future.

Evidence from historical, sociological, ecological, and agronomic factors has accumulated suggesting that an undetermined number of the herbs of the Chinese *Materia Medica* could be produced in North America. The US growers' network, over the years, has developed a list of 150 species that are prioritized for production. Priority factors include: availability of reliably identified germplasm, suitability to various ecological niches available on member farms, and the level of interest or demand among the customer base. Priority species can be adapted to the wide range of production systems available on American organic farms. Although Chinese herb growers in the United States are hard-pressed to overcome the obstacles they face, several long-term trends can be identified that could alter the framework of the problem which include continued innovation in agriculture, increasing acceptance and support from the market, disruption of supply lines for imported products whether from scarcity or increased costs.

Adding TCM to conventional Western medicine treatments for coronavirus disease 2019 (COVID-19) patients may be promising with respect to improved treatment outcomes. Unfortunately, TCM is not widely used in the American hospital system, if any. Although vaccination in the United States has greatly reduced hospitalizations and deaths from COVID-19, how to manage complications of COVID-19 is still a challenge.[13] The effects of what is now formally referred to as long-lasting COVID-19 disease or long COVID is estimated to affect millions of individuals who have previously contracted COVID-19, with symptoms including fatigue, headache, dyspnea, and anosmia.[14] If TCM were more integrated into the healthcare system of the United States and demonstrated similar safety and efficacy as the results observed in China, then severe/critical cases and associated mortality hypothesized would be significantly reduced. At the current time, there is only one registered clinical trial of TCM to treat mild to moderate COVID-19 in the United States.

The most common treatment principle to treat pain with acupuncture is to activate channels to relieve pain but there is not much attention on treating the patient's *shen*. *Shen* is the governor of life; it controls all physical and mental activities. Pain is a subjective symptom. The disorders of *shen*, include the disorders of *hun* (the ethereal soul) and the disorders of *po* (the corporeal soul), in pain sufferers can negatively affect how they feel or recognize pain, how they respond to pain and how they report their pain level. Guarding *shen* or treating *shen* is the key to an effective treatment for chronic pain. A list of points with names related to *shen* is provided that give clues that they could be beneficial for the treatment of *shen*. The practitioner should palpate the point to detect and determine the state of *shen* of that point before needling. It is essential to apply tonification and reduction needling technique to restore the normal state of *shen* in each and all selected points in a treatment. A clinical case report presented.

3 Future perspective

In North America, acupuncture and Chinese herbal medicine is categorized as a part of complementary and integrative medicine, showing its advantages, and confirmed therapeutic effects through accepted and standardized clinical trials. Integrative medicine is a trend of 21st century medicine in North America which has been described as "the full range of physical, psychological, social, preventive, and therapeutic factors known to be effective and necessary for the achievement of optimal health throughout the life span … which could shift the focus of the healthcare system toward efficient, evidence-based practice, prevention, wellness, and patient-centered care, creating a more personalized, predictive, and participatory health care experience."[15] It is foreseeable that Acupuncture and Chinese herbal medicine will play more important roles in integrative medicine, especially in regards to the non-pharmacological pain management initiatives in North America.[16,17] The development of TCM in North America, both clinically and academically, will greatly contribute and promote the globalization of TCM.

Funding

None.

Ethical approval

This article does not contain any studies with human or animal subjects performed by the author.

Author contributions

Yemeng Chen wrote and reviewed the article.

Conflicts of interest

Ye-Meng Chen is an Executive Editors-in-Chief of Chinese Medicine and Culture. The article was subject to the journal's standard procedures, with peer review handle independently of this Executive Editors-in-Chief and their research groups.

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Edited by Jiayu Gong

How to cite this article: Chen YM. Overview of the development of Chinese Medicine in North Americas. Chin Med Cult 2022;5:199–201. doi: 10.1097/MC9.0000000000000038.

Research article

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Transmission of Knowledge and Practice between Cultures: A Case Study of Chinese Medicine Integration in the United States

William Morris✉

Abstract

Medicine operates within the world views of the culture that it serves, and the widespread Chinese diaspora has carried medical practices with it. The resulting creolization takes shape at the borders of intersecting cultures in a distinct form of integration. This article explores the intersections of integration relative to the spread of Chinese medicine in the United States in practical, cognitive, and theoretical terms. This article could be a reference to practitioners, academics, and policymakers in the areas of integrative and Chinese medicine.

Keywords: Acupuncture; Culture; ICD-11; Integrative medicine; Sociology; Traditional Chinese medicine; Transdisciplinarity

1 Introduction

Integrative medicine describes the whole systems of care. The verb "integrate" means to render something as a whole. The idea of integration provides a wholeness perspective, where there is integrity within and throughout systems. Thus, systems-based care is a core competency for all forms of medicine.[1]

Integration occurs among individuals, municipalities, counties, states, and federal and global zones, and will include exopolitics. Practitioners integrate methods of thought and procedures. For a Chinese medicine practitioner, integration can also occur between knowledge gained in state-approved educational systems and family lineage forms of practice.[2]

Integrative medicine expresses the essence of humanity. This point of view is at the heart of Chinese medical practice. The integration takes place across cultures, time, within the person, between people, and across jurisdictions and institutions.

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Chinese Medicine and Culture (2022) 5:4

Received: 2 July 2022; accepted: 30 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000030

2 Chinese medicine in the United States

Traditional Chinese medicine (TCM) began integrating into the culture of the United States on the East Coast. Franklin Bache, MD, great-grandson of Benjamin Franklin, translated and published Morand's Memoir on Acupuncture in 1825.[1] William Osler, the father of American medical education, stated that acupuncture was good for "lumbago" while serving at Johns Hopkins University in 1892.[2,3] The two scholars were the first leading advocates and researchers of TCM in the United States.

Chinese immigrants also had brought a different perspective to integrate TCM into American medical culture since the 1850s. It was palpably different from the adaptations made by conventional practitioners such as Osler and Bache. The first acupuncture and Chinese medicine laws took place along the West Coast. Of note, the East Coast focused on acupuncture to the point that the schools in that region also prioritized acupuncture over herbal medicine as part of their mission. After the first wave of acupuncture schools, in the second wave, in the late 1970s and early 1980s, schools in the West Coast developed Chinese herbal programs. During the 1990s, the Florida and Massachusetts acupuncture associations provided 2-year herbal programs to which qualified practitioners can sit for the National Certification Commissions for Acupuncture and Oriental Medicine examinations.

The cultural diaspora partly facilitated the influence of Chinese medical thought in the United States along with the build-out of the railroad systems that went through Davenport, Iowa. It was where Daniel David Palmer lived, practiced, and created Chiropractic medicine. Thus, Chiropractic may be a product of tuina integrating with scientism and European concepts of

vitalism. The chiropractors survived the impact of the Flexner inquisition by claiming not to be medical practice. It is reasonable to say that the American healthcare environment has changed with the advent and firm entrenchment of Chiropracticas the discipline became part of the Medicare system in 1895.

Doc Hay (Ing Hay) practiced in Oregon. He came from a family lineage of herbalists and likely began practice in 1883.[4] His presence in Oregon would have contributed partly to accepting foreign medical practices in the United States. Indeed, Oregon became one of the first states to create a practice act for acupuncture and Chinese medicine. To clarify, a practice act is a contract between the profession and the social system it serves.

3 Early integrative medicine in the United States

Abraham Flexner, a teacher by trade, was also a reformer of medical education, attempting to understand its place in society. Flexner's 1910 report *Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching* shaped the medical-industrial-investment complex and scope in the current medical field.[5]

Flexner's report also may have reduced the use of natural products in the US healthcare between 1910 and the 1960s. That gap became apparent to policymakers when David Eisenberg's study, *Unconventional Medicine in the United States -- Prevalence, Costs, and Patterns of Use*, demonstrated the amount of money Americans spent out of pocket on "complementary and alternative healthcare."[6] It showed a substantial amount of uninsured dollars Americans spent on complementary and alternative medicine.

Dr. Stephen Kanter, the editor-in-chief of *Academic Medicine*, reviewed the history of 100 years since Abraham Flexner wrote his industry-changing report.[7] Topics ranged from curricular content and the length of medical training to the contrast between disease management and population-based health improvement. Glaringly absent were the documents that displayed the monopolizing results of the report on the medical practice and workforce.

Flexner's collaboration with the American Medical Association and the Carnegie Foundation went beyond balancing and cleansing a corrupt medical and educational system. Schools with a preference toward botanical medicine and homeopathy were closed, as they often did not work with surgical wards and chemical laboratories. Schools with women and mixed races were also closed. One school with Afro-American medical trainees was allowed to continue in the south. With low Flexner site visit scores, homeopathic and eclectic medical school graduates were also denied admission to state medical examinations.[6]

4 Social closure in trans-cultural medical practices

The protection of medical worker classes was evident in the works of the Flexner site visits. The regulatory capture of education and the noosphere of the public by the pharmaco-industrial-investment complex were successful. The United States and the rest of the world purchased the idea that real medicine only used patented molecules and surgical procedures. This development caused an explosion of growth centered on profound economic gains served by processes of social closure. At the same time, virtues of not confusing the public resonated within the halls of institutions and government. The regulatory accomplishments for Traditional medicine (TM) in the United States had limits. The terms "complementary and alternative" helped sustain social closure and medical classism in the workforce.[8]

Closure depicts a process of domination whereby one group creates a monopoly by closing off opportunities to outsiders. There are four types of closure: exclusion, demarcation, inclusion, and dual forms.[9,10]

1. Exclusion exercises the hierarchical dominance of inferior social groups by closing off access to opportunities and resources. It occurs by creating specific skill sets and credentials that protect and secure privileged access to the market.
2. Demarcation occurs when a discipline member monitors and regulates closely related occupations defining and controlling boundaries between them. Exclusion suppresses vertically, while demarcation does so horizontally.
3. Inclusion refers to subordinates' attempts to access the advantages of higher-level groups. It can easily be dismissed by the more elite as usurpation.[11]
4. Dual closure occurs when a demarcated group resists demarcation and establishes a new sphere of competence with notable exclusions.

A privileged worker class often holds closure to be in the interest of public safety. It is ostensibly used to prevent confusion. From another point of view, closure contributes to a political and economic environment where atomization and specialization of knowledge isolate and disconnect people, compromising best practices in care.[12]

For example, a doctoral program in Los Angeles gained access to Good Samaritan Hospital for training learners in the acute rehabilitation unit and the emergency room. No Chinese medical terms were permitted in the chart, but only biomedical terms, creating closure based on professional terms. Thus, learners used modern scientific medical terminology to describe TCM patterns, thought processes, and treatment plans. This cognitive form of social closure ostensibly protects the biomedical-legal practice which potentially devastates traditional practices in a trans-cultural environment.

There are other forms of social closure in medical record keeping. Medical records can be kept in different filing systems, leading to a lack of awareness among practitioners responsible for patient care. The *International Classification of Disease* 11 (ICD-11) code set provides a solution, as it provides a basis for best practices regarding communication and knowledge supplied by shared medical record keeping.

5 Social systems and integration

Integration throughout the strata of medical endeavor possesses great potential. The process takes place from private practice to policymaking at federal, state, and institutional levels. The economic implications and financial reform in connection with mind-body relationships pose distinct concerns relative to the redistribution of wealth and power in healthcare.

Modern roots of cognitive integration between Western medicine and TCM started in China when Chairman Mao sought to bring a premier form of care to humanity. To accomplish this goal, he brought western surgeons and TCM practitioners to Beijing, where they worked in concert with the themes used to drive the development of a superior form of medicine. Kim Taylor presented five phases designed to accomplish the goal of integration in his book *Chinese Medicine in Early Communist China, 1945-63, A Medicine of Revolution*.[13]

- The Cooperation of Chinese and Western Medicine (1945–1950);
- The Unification of Chinese and Western Medicine (1950–1958);
- Chinese Medicine Studies Western Medicine (1950–1953);
- Western Medicine Studies Chinese Medicine (1954–1958);
- Integration of Chinese and Western Medicine (1958–present).[14]

The development of authentic and representative policies involves the integration of voices across the spectrum of all healthcare provider classes. All genders, styles, and races populating the licensed providers must be at the policymaking table, from institutional to state and federal, at all decision-making strata. The integration process is to possess compassionate humanism as a feature of the values.

Among the most significant papers affecting policy regarding Chinese medicine and acupuncture in the United States is the Eisenberg study, *Unconventional Medicine in the United States -- Prevalence, Costs, and Patterns of Use*. The United States began to recover from the losses created by the interest parties supporting the Flexner report. In 1990, there were an estimated 425 million visits to providers of "unconventional" therapy, exceeding the 388 million visits to primary care physicians. Money spent was approximately $13.7 billion, three-quarters of which ($10.3 billion) was out of personal funds. In comparison, $12.8 billion was paid out of pocket annually for all hospitalizations in the United States in the same year.[15]

Paralleling with Eisenberg's landmark 1998 study, the FDA reclassified acupuncture needles from Class III to class II. This 1996 decision made acupuncture needles a medical device rather than experimental equipment.[16]

As growth and change continued, President Clinton signed an Executive Order 13147 on March 7, 2000, forming the White House Commission on Complementary and Alternative Medicine Policy.[17] As a result, medical schools began considering East Asian medical practices to be forms of integral medical practices. Insurance carriers could no longer deny coverage based on the experimental status of needles.[18] The growth of TCM in the West is exemplified in the increase of related research that supports the efficacy and safety of acupuncture.[19]

The Institute of Medicine (IOM) President, Harvey V. Fineberg, MD, PhD, defined integrative medicine as:

> "…orienting the health care process to engage patients and caregivers in the full range of physical, psychological, social, preventive, and therapeutic factors known to be effective and necessary for achieving optimal health."

The definition was put forward at the Summit on Integrative Medicine and the Health of the Public held on February 25 to February 27, 2009 in Washington, DC.[1,20] Such a definition sidesteps the reality of the medical workforce and regulatory capture that lead a nation to believe in a mono-cultural perspective on integration whereby the sophisticated approaches of traditional medical systems are made unavailable. Unlike Fineberg's definition, the existing biomedicine definition is predicated on the known and loses traction with emergent trans-cultural concerns in medicine.

The World Federation of Chinese Medicine Societies (WFCMS) reports that as of 2021, Chinese medicine has spread to 196 countries and regions, reaching over one-third of the world's population. More than 80,000 TCM institutions are established overseas, and there are approximately 300,000 practitioners of various types of TCM worldwide. Chinese medicine has been registered in the form of a drug in Russia, Cuba, Thailand, Vietnam, Singapore, the United Arab Emirates, and the Philippines. WFCMS also recounted data from World Health Organization (WHO), showing that among 113 member states that recognize the use of acupuncture, 29 countries have established relevant laws and regulations, and 20 countries have included acupuncture in the health insurance system. Some national health insurance systems cover other forms of TCM therapies.

Furthermore, "more than 60% of National Cancer Institute (NCI) designated comprehensive cancer centers incorporate acupuncture for cancer symptom management."[21,22] The net result is a trans-cultural ferment of acupuncture and herbal medicine practices within all these regions.[23]

6 The ICD-11 codes

One of the most significant developments regarding the integration of TCM in the world took place in May 2019 when the member states of the WHO adopted the ICD-11 Chapter 26 on TM.[24] In response to the need for integrated reporting, the WHO member states, TM practitioners, professional TM associations, and educational institutions requested the TM Chapter. It was formalized in response to the international convention supporting healthcare for all, as articulated in the Declaration of Alma-Ata on Primary Health Care (1978) and the Declaration of Astana (2018).[25,26]

TM serves as primary care in many countries worldwide, especially throughout the Asia-Pacific. The TM practitioners gain licensure and training on par with medical doctors. Due to the lack of integrated reporting system, the practices are often underreported. It leads to a lack of aggregated, international data regarding TM encounters in form, frequency, effectiveness, safety, quality, outcome, and cost.

The ICD-11 TM Chapter will improve the regulation and integration of TM in mainstream healthcare and health information system. Efforts to effectively regulate TM as an integral part of the health system require standardized and evidence-based information.[27] The ICD-11 codes provide compatibility and interoperability of digital health data. It contains diseases, disorders, and health conditions. Given the widespread use of TM throughout the Asia-Pacific region, including coding practices for understanding public health is a best practice. The World Health Assembly endorsed the new revision of ICD at the 72nd meeting in 2019, which came into effect globally on January 1, 2022, breaking the bind of social closure.[28]

As a concerted effort to influence the inclusion of TM via the ICD-11 Chapter 26 emerging, however, a perfect storm brewed. Experts abandoned scientific and policy journals.[24] Peer reviews and evidence evaporated. A new locus of debate emerged in politic, business, popular science, and social media platforms, unduly influencing popular opinion. The polemics included themes of TM's impact on endangered species, toxicity, and contaminants. The narratives possess a disturbingly unified language and conceptual frame. Who funded this effort and why?

The medical-industrial-investment conglomerates have financial interests and motives in maintaining control over the medical marketplace and workforce. The titans should be the first place to explore as they retain a near-totalizing level of regulatory capture and provide scientific biochemical methods in the halls of academia, policy, and governance.

Fortunately, the chapter in ICD-11 now makes it possible to collect and report on TM conditions in a standardized and internationally comparable manner. The scope contains terms for conditions described in ancient China and is now used in contemporary TCM practice. This formative action provides a basis for the second module, which will include Ayurveda and other TM diagnostic systems.

There are limitations in the ICD-11 codes as it is not used for mortality evaluations. The bounds include optional dual coding for the morbidity data collection, reporting, reimbursement, patient safety, and research.[28]

7 Toward future integral possibilities: a transdisciplinary view

The potential of the trans-disciplinary movement provides guiding principles in the discourse on medical integration, which is worthy of consideration. The root word discipline provides the basis for this discussion. In old English, a disciple follows another for learning. Discipline later became a branch of instruction or education. It is subsequently considered to be systematic rules and regulations, and features of the medical professions. Transdisciplinary study explores how the rules and knowledge systems connect and integrate.

The transdisciplinary view possesses an "included middle" that is essentially paradoxical. In Aristotelian logic, factor A cannot be Z, and Z cannot be A. The transdisciplinary view holds that A can be Z from the place of their commonalities. This zone of the "included middle" is also called isomorphism. In medicine, that isomorphism is the commonality of disease location, progression, and severity. These three features provide an underpinning for what in anthropology called structuralism. It is at this level that proper integration can take place.[29–31]

- There is specialized knowledge within an overriding unity of cognitive endeavor.
- A standard set of metaphors and concepts defines the field of inquiry.
- There are taxonomies for structuring knowledge of the field.
- There are particular methods of investigation and specific means for determining the truth of claims made in practice.
- There is an idea of purpose relative to the discipline.
- An organized group that studies the discipline trains other practitioners and forms the social mechanism for arbitrating various truth claims within the profession.

In practice, it is helpful to distinguish transdisciplinary from interdisciplinarity and multidisciplinarity. Multidisciplinary often refers to a diverse group of disciplines and their practitioners located within proximity and typically in the same facilities. Such practices are increasingly common, with Chinese medicine included as a discipline.

Interdisciplinary practices will often have more collaborations. Examples include Cedar Sinai or Good Samaritan in Los Angeles, where acupuncturists collaborate with practitioners of various disciplines to provide patient care. The author participated in an integrative, interdisciplinary project during the early 1990s in the Berkshires of Massachusetts. All the providers, including

MD, and PhD biochemists in nutrition, art therapy, and movement therapy, sat together at the beginning of a 2-week retreat and explored the medical records with pictures of the patients. This process was a genuinely integrative medical project.

Transdisciplinarity is a practice that transgresses and transcends disciplinary boundaries, whereby groups of different practitioners are multidisciplinary.[32] It links and integrates disciplines through the trans-media of biological, spiritual, and cultural epistemologies.

In summary, interdisciplinarity describes processes and information traveling between fields. Multidisciplinarity is a grouping of disciplines in an effort toward a common purpose; trans-disciplinarity is information systems that move between, across, and beyond all disciplines.

8 Conclusion

Transdisciplinary practice is complex and it requires creativity to negotiate the range of psychosocial challenges. An approach of cooperative inquiry may generate sufficient trust to maintain the connections between members of the engaged.[33]

Cooperative dialogue brings ethical challenges to the various strata of integration. Power imbalances carry a risk of closing out dissenting or minority voices. One of the most significant risks is the loss of cultural identity and salient medical traditions in the integration process. Overcoming these challenges and risks are no small tasks, but are unavoidable if interdisciplinary and interprofessional teamwork is to have any real meaning.[33]

Chinese medicine has a history of providing low-cost, adequate health care. Furthermore, studies such as the GerAc (German Acupuncture) Trials show a lower cost of care than conventional medicine.[34]

A review of the GerAc trials and their impact on public health policy in Germany and ongoing research in other countries suggest that including acupuncture and Chinese medicine in the medicare system will lower the cost of healthcare.[35] Such causes for the common good are impeded by federal healthcare budgetary resources, workforce, and monopoly of pharmaceutical conglomerates, as reducing the cost of care can adversely impact the economic interests of certain institutions, municipalities, state, national, and international agencies.

Possible solutions are available through models such as cosmopolitan power, in which acupuncture and Chinese medicine are beneficial to the Western world, resulting in an egalitarian worldview.[36,37] There are systemic risks in our current state of development.[38,39] An egalitarian healthcare system is not inevitable, given the economic interests of certain parties are at stake. There remains, however, a dynamically evolving set of possibilities. A pluralistic medical culture may generate some solutions for humanity.[40]

Integrative medicine has dimensions that focus on individual as the center. Patient-centered care is the core from which integral systems extend. The need is to create healthcare processes that provide a seamless engagement between patients and caregivers in the full range of physical, psychological, social preventive, and therapeutic factors. In short, it is about integrating approaches and systems. As for the integration of Chinese medicine, the process seems to be ongoing but at the risk of a premature conclusion.[1]

Funding

None.

Ethical approval

This study does not contain any studies with human or animal subjects performed by the author.

Author contributions

William Morris has done the research and the writing of the paper.

Conflicts of interest

The author declares no financial or other conflicts of interest.

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Edited by Zhiheng Guo

How to cite this article: Morris WR. Transmission of knowledge and practice between cultures: a case study of Chinese medicine integration in the United States. Chin Med Cult 2022;5:202–207. doi: 10.1097/MC9.0000000000000030.

Research article

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Chinese Immigrants' Health Beliefs and Practices of Traditional Chinese Medicine in British Columbia of Canada

Tina Wu✉

Abstract

Objective: This study is to address the health beliefs and health behavior of Chinese immigrants residing in the Greater Vancouver area of British Columbia (BC) Province in Canada. This article discussed Chinese immigrants' traditional Chinese medicine (TCM) use, health beliefs, and health behaviors.

Methods: Information used in this study is based on data collected in the Chinese-speaking community in the Greater Vancouver area of BC in 2020–2022. Quantitative and qualitative methods were applied to this study. The first stage recruited 314 participants for the quantitative study to cross-validate an instrument tool, followed by the 2nd stage of 20 stratified random sampling out of the 314 participants for TCM-related in-depth qualitative interviews. This study focuses on the second stage of TCM qualitative interviews.

Results: Results indicated that TCM health beliefs have cultural and spiritual meanings tied to the Chinese-speaking participants. There are barriers for the Chinese-speaking population to access the existing healthcare services due to their TCM health beliefs and other health needs, for example, family doctors, integrated medicine for better health outcomes, and mental health services especially during the coronavirus disease 2019 (COVID-19) pandemic.

Conclusion: Integrating TCM health beliefs and behaviors of Chinese-speaking immigrants into existing Canadian mainstream health services are strongly recommended.

Keywords: Culture; Health behavior; Health belief; Healthcare need; Traditional Chinese medicine

1 Introduction

Multiculturalism is highly valued in Canadian society. In the Province of British Columbia (BC), there are more than 200 ethnic groups reported in Greater Vancouver based on Statistics Canada (2016).[1] About 42% of the population is made up of visible minorities.[2] The uprising immigration pattern brings challenges as well as opportunities to Canada. Their health beliefs, healthcare needs, and service utilization behaviors could be different from the mainstream population.

In 2015, the BC Ministry of Health announced that the province will strive to deliver healthcare as a service built around the individual, not the provider and administration. The framework is designed to build on existing efforts and accelerate the adoption of patient-centered care practices in BC. It emphasizes the care for all individuals residing in BC, including visible minorities. The shared vision for patient-centered care is to put patients at the forefront of their health and care, ensure that they retain control over their own choices, help them make informed decisions, and support a partnership between individuals, families, and healthcare services providers. The following components are keys to patient-centered care in BC[3]:

- self-management;
- shared and informed decision-making;
- an enhanced experience of healthcare;
- improved information and understanding;
- the advancement of prevention and health promotion activities.

Can these components apply to all individuals in BC? The Chinese-speaking immigrants residing in BC have unique healthcare and preventative care beliefs and practices embedded in their culture for better patient-centered care outcomes. Unfortunately, their culture has not yet blended into mainstream healthcare services.

1.1 Health beliefs and health behaviors

First of all, understanding health beliefs and health behaviors is essentially important. According to Cukor et al,[4]

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Chinese Medicine and Culture (2022) 5:4

Received: 18 August 2022; accepted: 31 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000035

"Health beliefs, particularly feelings of self-efficacy, relate to an individual's perceived ability to perform a certain behavior. These perceptions of self-efficacy may influence whether individuals will attempt certain behaviors and how the behaviors will be carried out."

Furthermore, a Health Belief Model (HBM) was developed in the early 1950s by social scientists at the U.S. Public Health Service[5] to understand the failure of people to adopt disease prevention strategies or screening tests for the early detection of disease. Later uses of HBM were for patients' responses to symptoms and compliance with medical treatments. The HBM suggests that a person's belief in a personal threat of an illness or disease, together with patients' responses and compliance, can predict the effectiveness of the health behavior recommended by healthcare providers.[6]

The HBM derives from psychological and behavioral theory with the foundation that the two components of health-related behavior are 1) the desire to avoid illness, or conversely, get well if already ill and 2) the belief that a specific health action will prevent or cure illness. An individual's course of action often depends on the perceptions of the benefits and barriers related to health behavior. There are six constructs of the HBM. The first four constructs were developed as the original tenets of the HBM. The last two were added as research about the HBM evolved.[7]

1) Perceived susceptibility. This refers to subjective perception of the risk of acquiring an illness or disease. There is wide variation in feelings of personal vulnerability to an illness or disease.
2) Perceived severity. This refers to feelings on the seriousness of contracting an illness or disease (or leaving the illness or disease untreated). There is wide variation in feelings of severity, and often a person considers medical consequences (eg, death, disability) and social consequences (eg, family life, social relationships) when evaluating the severity.
3) Perceived benefits. This refers to perception of the effectiveness of various actions available to reduce the threat of illness or disease (or to cure illness or disease). The course of action taken in preventing (or curing) illness or disease relies on consideration and evaluation of both perceived susceptibility and perceived benefit, so that the person would accept the recommended health action if it is perceived as beneficial.
4) Perceived barriers. This refers to feelings about the obstacles to performing a recommended health action. There is wide variation in feelings of barriers, or impediments, which leads to a cost and benefit analysis. The person weighs the effectiveness of the actions against the perceptions that it may be expensive, dangerous (e.g., side effects), unpleasant (e.g., painful), time-consuming, or inconvenient.
5) Cue to action. This is the stimulus needed to trigger the decision-making process to accept a recommended health action. These cues can be internal (e.g., chest pains, wheezing, etc) or external (e.g., advice from others, illness of a family member, newspaper article, etc).
6) Self-efficacy. This refers to the level of confidence in the ability to successfully perform a behavior. This construct was added to the model most recently in the mid-1980s. Self-efficacy is a construct in many behavioral theories as it directly relates to whether a person performs the desired behavior.

1.2 Impact of culture on health beliefs and health behaviors

APA Dictionary of Psychology defines culture as "the distinctive customs, values, beliefs, knowledge, art, and language of a society or a community. These values and concepts are passed on from generation to generation, and they are the basis for everyday behaviors and practices."[8]

Furthermore, culture is a hidden and obvious influential factor in behavior. Usually, culture can be described as an iceberg, with its most influential components hidden under the ocean, for example, one's values and ethics, beliefs, communication style, and handling one's emotions.

In Canada, different cultural groups have diverse belief systems regarding health behaviors and healing. These belief systems may include different disease models, wellness and illness paradigms (e.g., traditional Chinese medicine), various culturally specific diseases and disorders, feelings about healthcare providers, their perception in seeking Westernized healthcare, and the use of traditional healthcare practices and approaches.

Health belief and health behavior are cultural concepts because culture frames and shapes how we perceive the world and our experiences. Along with other determinants of health and disease, culture helps to define the following[9]:

- How patients and healthcare providers view health and illness.
- What do patients and healthcare providers believe about the causes of disease?
- Which diseases or conditions are stigmatized and why? In many cultures, depression is a common stigma, and seeing a psychiatrist means a person is "crazy."
- What types of health promotion activities are practiced, recommended, or insured? In some cultures, being "strong" (or what the Canadians would consider "overweight") means having a store of energy against famine, and "strong" women are desirable and healthy.
- How illness and pain are experienced and expressed. In some cultures, stoicism is the norm, even in the face of severe pain. In other cultures, people openly express moderately painful feelings. The degree to which pain should be investigated or treated may differ.

- Where do patients seek help, how do they ask for help, and, when do they make their first approach. Some cultures tend to consult allied healthcare providers first, saving a visit to the doctor when a problem becomes severe.
- Patients' interaction with healthcare providers. For example, not making direct eye contact is a sign of respect in many cultures, but a care provider may wonder if the same behavior means that his/her patient is depressed.
- The degree of understanding and compliance with treatment options recommended by healthcare providers who do not share their cultural beliefs. Some patients believe that a physician who doesn't give an injection may not take their symptoms seriously.
- How patients and providers perceive chronic disease and various treatment options.

Culture also affects healthcare in other ways, such as:

- Acceptance of a diagnosis, including who should be told, when, and how.
- Acceptance of preventive or health promotion measures (e.g., vaccines, prenatal care, birth control, screening tests).
- Perception of the number of individuals in preventing getting the disease and monitoring the progression of the disease.
- Perceptions of death, dying and who should be involved.
- Use of direct or indirect communication. Making or avoiding eye contact can be viewed as rude or polite, depending on the culture.
- Willingness to discuss symptoms with a healthcare provider when an interpreter is present or not.
- Influence of family dynamics, including traditional gender roles, filial responsibilities, and patterns of support among family members.
- Perceptions of youth and aging.
- Accessibility and function of the health system.

1.3 Traditional Chinese medicine

The participants of this study are Chinese-speaking immigrants residing in BC. They encounter challenges and opportunities when using Canadian healthcare services. Their Chinese perspectives on health and their health practice could be considerably different from mainstream Western perspectives, including most of the Canadian healthcare providers. They bring with them a combination of philosophical, cultural, and religious beliefs, as well as values, symbols, rituals, and practices consciously and unconsciously influenced by a syncretic blending of Confucianism, Buddhism, and Daoism. Concepts such as the *qi* and *yin-yang* are unique features of the Chinese views of health.[10] According to traditional Chinese medicine (TCM), weak, stagnant, and imbalanced *yin-yang* and *qi* give rise to health problems. From the Chinese perspective, humans are regarded as an integrated part of nature, and therefore, protecting and maintaining the integrity of the human-nature unity is fundamental to health and health practices.

The Western medicine perspective of illness is different from that of the Chinese. It focuses on abnormalities in the structure and function of organs and body systems.[10,11] For example, Western perspectives on health beliefs and behaviors are divided into two categories, health-enhancing or health-compromising. In Canada, Western healthcare providers regularly recommend their patients for health-enhancing behaviors such as doing exercise, eating healthy, and sleeping well. Those behaviors may require special skills, knowledge, equipment, and allocation of time to activate the health-enhancing behaviors. The likelihood of performing health behaviors is attributed to predisposing health beliefs. The other category is health-compromising beliefs and behaviors in Western medicine. They could be smoking and drinking behaviors that are harmful to health. The common practice has been challenged in terms of its ability to predict the effectiveness of healthy behavior, and the extent to which they reflect the cognitive processes that influence one's health-related choices.

On the contrary, Chinese culture does not distinguish clearly between health-related and other forms of behavior. Instead, everyday conduct is directed toward maintaining the yin-yang balance and the qi flow in the body. When an imbalance arises, there are some courses of action that may restore the balance which could involve activities considered to be healthy behaviors and also activities related to social, work, finances, and relationships. The Chinese are firm believers in balancing the *yin* and *yang* with food for better health.[12]

TCM focuses on healing the root causes of disease in addition to treating symptoms. TCM encompasses nutrition, acupuncture, herbal medicine, mind-body exercise, and Tui Na (推拿). The TCM food study includes how specific foods relate to the seasons, the five elements, and health.[13] Within TCM, each "organ" is not just the actual and individual organ, but rather a whole system unto itself that regulates many aspects and functions of the body. There is a close relationship among these organ systems, the five flavors of food, and the five elements. The practice of Chinese dietary therapy comprises choosing specific foods to cause the desired change in health. For example, pungent or spicy foods tend to increase circulation and sweet foods tend to nourish the body.[14]

1.4 Healthcare needs of Chinese-speaking immigrants

There are general cultural differences between the culture of Chinese-speaking immigrants and the mainstream culture in Canada.[10] Although the general differences can be instructive, the inter-relationship between the two needs to be taken into consideration. As the interaction between the two cultures increases, there is the possibility of mutual influence. Health beliefs and behaviors, cultural values, and healthcare needs could be integrated. The term researchers used to describe the process is "assimilation" or "acculturation." However, the Chinese immigrants also tend to be resistant to this process. They continue to maintain their traditional culture while adopting some aspects of the mainstream culture. It is the reason why many

Chinese Canadians participate successfully in everyday Canadian life, but do not necessarily see themselves as part of the mainstream culture. In summary, they still maintain their unique needs when seeking healthcare services. They may need some healthcare service accommodation from Canadian society.

The diversity and inclusion movement during the coronavirus disease 2019 (COVID-19) pandemic calls for diversity, equity, and inclusion (DEI) in healthcare services as well.[15] In this approach, a more in-depth understanding of Chinese-speaking immigrants' healthcare needs and the relevant issues and concepts is necessary.

2 Methods

To address the healthcare needs of Chinese-speaking immigrants in BC, this research study was conducted in 2020–2022 to provide a more in-depth understanding of their TCM health beliefs and behaviors. The Research Human Ethics Board (RHEB) process was approved by the Human Research Ethics Board of Trinity Western University (File #: 20F04) for 2020–2022. This study has obtained informed consent from all participants.

2.1 Data collection

Quantitative method and qualitative methods were applied to the study. In total, 314 participants were recruited for the 1st stage quantitative study to cross-validate an instrument tool for the study [i.e., Patient Reported Outcome Measures (PROM)], followed by 20 participants selected out of the 314 participants in the 2nd stage using stratified random sampling based on gender, language preference, and age variables for in-depth qualitative interviews (Table 1). The average time for each interview is 40 to 60 minutes. Data collected for each stage was designed for a specific research purpose. The TCM-related concepts and use are only included in the second stage of data collection process to gain an in-depth understanding of the selected participants. The purpose and findings of the two stages were not related, but unique in their own ways.

The semi-structured qualitative in-depth interview was created by the research team, and interview questions were refined based on questions from the instrument tool validated in the first stage and in collaboration with two retired medical doctors, who acted as the patient partners for the research project. Interview questions included an inquiry into experiences of taking a specific healthcare outcome instrument online and past encounters with the Canadian healthcare system. To explore healthcare needs and outcomes, the interviewer asked questions such as: "Could you tell me a story about your health outcomes and how these relate to your quality of life?"or "Could you talk about how your healthcare needs are being met, or not met?." In addition, the interviewer probed further by asking questions about the extent to which these needs and outcomes were reflected in the healthcare outcome instrument (ie, PROM questions). The interviews that occurred in the Greater Vancouver area were conducted by a Chinese-speaking professional specializing in qualitative inquiry. Out of 20 interviews, eight were completed in traditional Mandarin (TRM), and 12 were completed in simplified Mandarin (SM). Each interview was recorded and transcribed verbatim using a professional transcription service from Chinese into English for backward and forward cross-validation purposes.

2.2 Data analysis

Storytelling, or narrative, is a useful tool for exploring and documenting the cultural contexts of health, which can be defined as the practices and behaviors that groups of individuals who share the same language, customs, and geography.[16] Healthcare issues experienced by culturally distinct groups can be articulated through a narrative process,[17] where detailed and nuanced stories could help illuminate subjective issues on healthcare utilization and health outcomes. A narrative research approach and thematic analysis were conducted to offer a deep understanding of the healthcare needs and outcomes perceived by Chinese-speaking immigrants and to determine the extent to which Chinese-speaking immigrants see their needs and desired outcomes reflected in the PROM questions.

Before formal data analysis, each transcript was read by two independent coders. The transcript of the 20 Chinese interviews were first reviewed by the Chinese-speaking researcher who conducted the interviews. The same transcripts were then translated into English and reviewed by a second non-Chinese speaking coder. This initial process was conducted to perform a narrative overview of each participant's story expressed through their interview. Data analysis was conducted using NVivo 12 data analysis software. The first coder

Table 1 Participant demographics

Variable	Age				Gender		Language preferred			
	30–40	41–50	51–60	61–75	Male	Female	Mandarin	Mandarin and English	Cantonese and English	English
Frequency	4	5	5	6	4	16	5	7	6	2
Percentage	20	25	25	30	20	80	25	35	30	10

was the same researcher who conducted the interviews. Validation was performed by the second non-Chinese speaking qualitative analyst (coder) based on the 20 transcripts directly translated into English.

The analysis of data includes the following four basic elements: categories (e.g., problem with health), codes (words of significance to the indicated problem, e.g., issue and difficulties), patterns (e.g., having problems in specific health area), and themes (identification of a major element, e.g., TCM practice, health needs, priority in health services) in a coherent manner. The research team examined raw data and performed thematic analysis to produce narratives. In addition, multiple coding processes occurred with knowledge users and patient partners to find a word or short phrase that could be attributed to a portion of the data. Then, relationships between similar categories and codes were found and combined to create a pattern. Themes emerged as patterns formed in each category and code until saturation was achieved without new patterns forming. The research team conducted an initial coding process and a cross-validation coding process until theme saturation occurred and no new themes emerged from the analysis.

From 2021 to 2022, two follow-up Zoom meetings were scheduled to validate the findings with the participants from the above analysis.

3 Results

3.1 Experience of Chinese immigrants using health services in BC

3.1.1 Language barrier

Dimensions of a cultural group include language, communication style, customs, beliefs, rituals, and roles which may be carried on by subsequent generations.[18] Participant stories highlighted several important cultural features related to their health. Though acculturation was observed in some accounts, it often occurred among younger generations compared to older generations of Chinese immigrants. Therefore, there may be significant impacts due to the presence of cultural differences between patients and care providers, preventing optimal quality of care.

The fear of misdiagnosis appeared due to language barriers. The following example illustrated the potential impact of language barriers on patients' healthcare outcomes:

> "…they also get nervous because they are afraid that inaccurate English communication will make [them] misdiagnosed. So that's why [they] would also be worried and [they] would want to be able to communicate more accurately with the doctor or the professional". (SM46)

3.1.2 Communication differences

Differences in communication extend beyond spoken languages at medical appointments. There are differences between Chinese culture and Western culture in describing and understanding medical symptoms.[17] When communicating symptoms, it is common for Chinese-speaking immigrants to describe them using terminology found within TCM.[17] Health issues are often expressed as *yin* (cold) or *yang* (heat), with the experience of having an excess or deficiency of either aspect.[17] In the case of one young male participant, the concept of balancing *yin* and *yang* for health maintenance was explained to his peers at work:

> "…I just explain to them…that what you drink, and then diet, and then those aspects, and then the temperature of it, and then being closer to your body's temperature and then it's going to be better for your digestive system and stuff like that. If it's too cold, then it's more likely to irritate the head". (SM12)

In addition to language barriers, participants also expressed their experiences of waiting too long for medical appointments and procedures as well as high medical costs among those who were not yet eligible for Medical Services Plan (MSP) in Canada.

3.2 Demand for culturally competent family physicians

In BC, there are too few physicians who integrate Chinese medical therapies into their practice due to their Western medicine-focused training. One participant expressed the need for family physicians to be familiar with TCM practices:

> "…if they have some understanding of traditional Chinese medicine, maybe to the patient some, before the history, and then the usual and so on, and then will be [clearer]". (SM12)

Some concepts related to maintaining *qi* and meridians found within the body are not often instilled into medical practices. Chinese-speaking patients who valued TCM felt a lack of connection to and understanding from their physicians. Participants also noted the focus of treatment over prevention in Western medicine, where medications were readily prescribed for various ailments which might have been targeted differently using TCM. A notable deficiency of TCM in Western medical settings extends beyond the need for holistic health-promoting herbs and therapies, such as acupuncture and acupressure. In palliative care settings, there was a contrast between Eastern and Western medical philosophies on what information ought to be shared with patients at the end of their lives. In this context, preserving dignity at the end of life is an important value in Chinese culture[19]:

> "In fact, I think it is not only a language communication but also in the culture to enable them to have some learning I am also in the learning process because we are after all a background over, Chinese culture is not too willing to talk about death this thing". (SM46)

Many participants expressed frustration when seeking a family physician, particularly one who is an effective communicator, who is bilingual, and who understands the philosophy behind TCM. Due to the limited time provided for each patient visit, language barriers may also prevent the physician from taking the necessary time to adequately assess patients' needs:

> "After looking for a family doctor, it is not easy to find, and the family doctor, he is always in rush is he will not be very careful to listen…". (SM262)

Participants described their own pursuit of TCM therapies, such as acupuncture, to complement therapies and medicines offered through Western medical practices. If needs were not sufficiently met, patients would seek out-of-pocket TCM therapies and herbs:

> "…you have to kind of jump through to get access to what you need, and then by the end of the day, I think a lot of Chinese people probably [say], "oh well, I'm just going to go to the herbalist down the street". (TRM47)

Physicians who are knowledgeable in Western medical practices and TCM were identified as important for enhancing the quality of care. Cultural competence is practiced through the "development of processes by which the individual examines his or her cultural principles, awareness, and understanding, and works toward developing a level of competence when working with diverse groups".[18] Culturally competent physicians who understand their patients (including spoken languages) would ensure the optimized quality of care for Chinese patients, as illustrated by this participant:

> "…he wants to find a doctor who can understand what he is saying, who can understand what he is saying, so that the quality of his medical treatment will be very high. The problem is now you have to find someone who can understand what you're saying and listen to what you're saying, so hard". (SM133)

4 Conclusion

4.1 Improving healthcare for Chinese-speaking immigrants

The practice of TCM among the Chinese-speaking immigrants residing in BC is examined in this qualitative research project. When integrating TCM with common available Western medical practices, "cultural capital" could be established and more service choices could be available by combining the two. The results could provide more options for health and disease management for the community.[17] Integrating TCM into Western medical practices could diversify the spectrum of services available for all Canadians. In Eastern countries, patients and caregivers often use Western medicine to treat acute conditions, yet TCM plays an important role in treating chronic ailments, particularly when Western medicine is not effective or leads to unwanted side effects.[19] However, literature also shows its utility in treating acute conditions, including some acute illnesses and strokes.[19] Chinese medicinal herbs could also be used as alternative medicine to promote better health outcomes for various acute illnesses.[19] Therefore, effective strategies used to target disease may not only be offered through medication or conventional medical intervention, but also by appropriate alternative medicine used in TCM.

Chinese immigrants residing in Canada have unique healthcare needs and beliefs that may differ from mainstream Canadians as well as the Chinese living in Asia,[20] thus requiring specialized healthcare services. A set of congruent behaviors, attitudes, and policies need to come together and work effectively in cross-cultural situations.[21,22] The demand for culturally appropriate communication in healthcare settings and its impacts on healthcare outcomes are evident in the literature. The recognition of different perspectives between patients, families, and healthcare providers is critical in providing quality cross-cultural care.[19]

As family physicians act as initial contacts for care, or "gatekeepers"[17] providing referrals to specialist services and necessary treatments, there is a need to address language barriers at this entry point as this affects the trajectory of care received by patients. The need for greater access to bilingual or Chinese-speaking physicians in Canada is also present in other parts of Canada. Similar to the findings of the current qualitative study, Chinese immigrants prefer to receive care from Chinese-speaking family physicians in Toronto.[17] Therefore, Canadian cities with multi-ethnic populations should increase the number of culturally competent physicians, especially family physicians in order to offer intervention and care in those cities.

4.2 Community call to action

Healthcare access, including navigating the Canadian healthcare system when seeking primary care, is difficult for immigrants, particularly for the elderly.[23] Lai and Chappell[24] recognized that social support was an enabling factor for Chinese immigrants to seek TCM. Therefore, a health network community should be created, particularly for the elderly, to promote access to existing resources including linkages to culturally competent and bilingual family physicians.

Health champions are people within the community who have the experience, enthusiasm, and skills to encourage and support other individuals and communities to engage in health promotion activities.[25] Among the Chinese diaspora in Vancouver, key community champions could be identified to host educational sessions, create knowledge translation materials, and build an online platform (i.e., website) for networking.

This health-promoting network could be able to offer information for key Chinese sub-groups, such as non-English speaking Chinese immigrants, elderly immigrants with limited resources, new immigrants, and international Chinese students.

5 Limitations and recommendation

There are several limitations to consider when interpreting the results of this study. Though the initial analysis was performed using the original Chinese transcripts by a Chinese researcher, the English-translated versions used for cross-validation may have lost some meaning during thematic analysis due to translational issues and grammatical errors. This prevented the capture of coherent narratives within each transcript due to key language elements lost in translation.

Further exploration into ethnic sub-groups within the interviewed participants is recommended to assess the differences in their healthcare needs. These groups include those using Traditional Mandarin and Simplified Mandarin, and new immigrants (<10 years) and immigrants who have been living in BC for over 10 years. By doing so, it could discover the differences within and between those sub-groups to have a more in-depth understanding of the factors that impact the healthcare needs of the Chinese-speaking immigrants residing in BC of Canada.

Funding

This research project entitled "Cross-cultural Validation Methods for Generic PROMS" (PCM-010) was funded for 2020–2022 by the BC Support Unit Methods Cluster under Michael Smith Health Research BC.

Ethical approval

The Research Human Ethics Board process of this research project was approved for 2020–2022 by the Human Research Ethics Board of Trinity Western University (File # 20F04).

Author contributions

Tina Wu is the lead principal investigator of this research project and the sole contributor of this paper.

Conflicts of interest

The author declares no financial or other conflicts of interest.

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Edited by Lin Su

How to cite this article: Wu T. Chinese immigrants' health beliefs and practices of traditional Chinese medicine in British Columbia of Canada. Chin Med Cult 2022;5:208–215. doi: 10.1097/MC9.0000000000000035.

Research article

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

TCM in Canada: Health Care and the Importance of Alternative Medicines that Complement Medical Practice

Honoré France✉

Abstract

This article explores the introduction and growth of traditional Chinese medicine (TCM) through the lens of Chinese immigration to Canada. It further explores how it has spread to other cultural groups in Canada. Several theories are described to explain why it has attracted attention by non-Chinese ethnicities: the interest in organic and nature-based approaches, the underfunding health care, lack of family doctors, expensive drugs from big pharmaceutical companies, and respect for Chinese cultural practices. The regulatory practice of TCM is described along with the organization, types of educational program and certification as well as a patient's perspective of TCM treatment.

Keywords: Canada; Chinese immigration; Education; Patient's perspective; Regulatory system; Theories of growth in non-Chinese patients

1 Introduction

Medical practices before the Europeans migrated to the place that is now called Canada was different, but sophisticated for the time. Similar to many societies around the world, it would be called folk medicine because it is based on natural medicines and healing experiences of mind and bodies.[1] Europeans came to the North America as traders, but the beauty of the land and abundance of natural resources made an impression to them. The settlers made themselves at home, instituted their colonial laws and practices, and eventually pushed the indigenous people into smaller and smaller areas. Conflicts between indigenous people soon developed as more Europeans arrived. Bringing with them were diseases from Europe that wiped out 3/4 of the indigenous population within a generation's time. The settlers called the eastern portions that they first conquered as Canada. The settlers later further expanded to the areas in the western regions.

Immigrants from around the world flocked to North America in the 19th century including people from China. Not only that the Chinese immigrants helped build the transcontinental railway and started businesses and farms, they also brought their cultural practices and influenced other ethnicities. In this article, the impact of immigrants from China would be profiled. The article would examine how traditional Chinese medicine (TCM) evolved and integrated into the health-medical system in Canada, the growth of TCM programs in higher education, the regulation and practice of TCM in Canada, and patient's perspective on why using TCM treatments.

2 Chinese immigration to Canada

To understand TCM in Canada, it is important to explore the immigration of Chinese people and the old culture that they brought with them. Chinese culture, science, philosophy, and practices such as TCM were brought to North America through Chinese immigrants. According to Wong,[2] with over 52 million Chinese living outside of China, they are the most mobile people in the world "shaping economies, cultures, and politics throughout Asia, the Americas, and the South Pacific". According to France and Sue[3]:

1. The three largest ethnic groups living in Canada from Asia are from China, India, and the Philippines.
2. Ethnicities from Asia make up 12% of the population of Canada. Therefore, approximately one in eight people in the Canadian population is Asian.
3. Of which, 21.9% is a landed immigrant or permanent resident, and projections indicate that the number will increase to 30% by 2036.

According to Shen et al,[4] "Canadians of Chinese origin are the largest non-European ethnic group in Canada,

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Chinese Medicine and Culture (2022) 5:4

Received: 5 July 2022; accepted: 31 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000033

and therefore represent an increasingly important segment of the population." TCM is an essential element of Chinese culture. According to Dr. Ben Baoqi Cao,[5] a well known TCM practitioner, it has been practiced in Canada since the first Chinese immigrants arrived in the 19th century. TCM has grown exponentially in Canada with users from all walks of life. The effectiveness and benefits of TCM can be seen in the health of those who use it. A study of the Canadian province of Alberta's population from 1995 to 2003 found that life expectancy at birth for ethnic Chinese residents was on average nearly 6 years longer than non-Chinese.[6]

3 Alternative medicine in Canada

The adoption of multiculturalism in Canada has led to the incorporation of TCM and acupuncture into the health care system. These medical services along with Western scientific-based medical practice have improved patient care. In the past, indigenous medicine was the norm until Western medicine as is known today became the dominant form of medical practice. Cultural historian Paul Craddock[7] demonstrates how the understanding of human anatomy and medical procedures has influenced Western medicine:

> "In the last 70 years or so, technology has enabled us to transplant organs, but transplants per se have been widespread for at least 500 years and are underpinned by 5,000 years of culture without which modern transplant …would be inconceivable....the story of transplants is about something closer to our hearts than pumps and valves; it's about how we understand our bodies and about our relationships with one another and with our ourselves."

In order to understand the popularity of alternative medicines, a number of themes that are prevalent in everyday life in Canada are discussed based on Craddock's research about our past and present experiences. Factors such as the industrialization and factory-oriented food production has resulted in a backlash and a rise in all things natural, including an acceptance and demand for more medical choices that alternative medicines offer. Generally, alternative medicines rely on organic and natural products. They have holistic practices and include a different way of thinking. Another factor is the rising cost of medical expenses. The high cost of pharmaceutical products and the respect for Chinese cultural practices are some of the themes that affect the growth of alternative medicines in Canada.

3.1 Organic and nature-based approaches

The experts of the medicine industry have noted that, over the past few years, there has been a rise in the demand for the inexpensive traditional Chinese medicines in the several emerging economies of the regions of Asia Pacific and East Asian, due to the increase in sales of the local drug manufacturing industry.[8] Thus, the interest in low-cost natural-based foods and medicines deriving from organic products is very strong in Canada and around the world.

Organic foods are in great demand especially in the developed world, with people from Asia and Europe interested in producing these products.[9] To this end, the Mayo Foundation for Medical Education and Research in 2022 has suggested that organic grains contain less harmful ingredients than non-natural grains or grains that rely on herbicides and pesticides to grow.[10] They also emphasize that natural foods and medicines create an emotional bond with the grower and consumer that is quite strong. According to Pétursson[11]:

> "…providing healthy food for those who stand closest, this emotional labor is also performed for the sake of the environment and to support organic producers—love for the near and dear is extended to the earth and to one's fellowman."

Some of the most widely utilized alternative medicines in Canada are TCM and naturopathic medicine. Naturopathic medicine is the practice of using natural medicines, diet, nutrition, homeopath, physical manipulation, and stress reduction to treat illness and maintain health. Interestingly, in a study on the use of complementary and alternative medicine (CAM), Professor Matthew Leach[12] found that:

> "...close to twelve percent of Canadian adults, sixteen percent of US adults, twenty-six percent of English adults, and twenty-three to forty-four percent of Australians had consulted a CAM practitioner, with massage being the most commonly used service."

3.2 Underfunding and expensive pharmaceutical

The Canadian health care system is more similar to the socialization of medical practice found in Europe, and is very different from medical practice in the United States. It is viewed as a human right and should be made available to all on an equal basis. The political left and right support socialized medicine and the right to use alternative medicines. However, one of the challenges is that there has been chronic underfunding of health care, and many people feel that family physicians are underpaid. For example, in 2022, there is currently a shortage of family doctors in Canada. According to Dr. Birinder Narang,[13] there is a need to address British Columbia (B.C.)'s family doctor shortage. Almost a million B.C. residents have no family doctor (1 in 3 residents). There is also shortage of family doctors across Canada. Medical school graduates increasingly do not want the jobs in family medicine according to the Canadian Broadcasting Company (CBC) News.

In 2022, The Canadian federal government has put forth a bill in Parliament to fund pharmaceutical

products for those who earn less. Citizens are also being asked to take out health insurance for medicines amid prices for prescribed medicines escalate. Everyone from all political parties agrees that the Canadian health care system is in crisis. More and more people in Canada are taking their health into their own hands and seeking help from alternative medicines such as TCM, Ayurveda, and naturopathic medicine.

3.3 Respect for Chinese cultural practices

In a personal conversation with Dr. Harris Fisher, a TCM practitioner in Victoria, B.C., he shared that he was drawn to TCM because of his interest in Chinese philosophy which he began to explore as a student of Asian martial arts. In exploring the appeal of TCM, Sciban[6] states that "…this appeal also derives from the fundamental values that TCM offers. Three of these values are apparent at first glance: TCM is economical, encourages involvement in one's own health care, and has an established record in providing pain relief." From a philosophical perspective, the appeal of Chinese culture and TCM is described eloquently by Professor Li Qizhong[14]:

> "Chinese medicine is rooted in the splendid traditional culture of China, and its theoretical exploration methods and explanations are based on the historical and colorful traditional Chinese culture. Chinese medicine is the towering tree that has lasted for thousands of years, is still flourishing, which expertly derives from the nourishment of traditional Chinese culture."

4 Accreditation and licensing regulations in Canada

Canada is a country of approximately 37 million people in a confederation of 10 provinces and three territories stretched across the northern area of North America. The vast majority of its people (86%) live in the provinces of Ontario, Quebec, British Columbia, and Alberta. Canada has two official languages, English and French with the majority of French speakers living in Quebec. As a confederation, each province regulates its educational and health care systems with funding from the federal government based in the capital city of Ottawa. Each province regulates all services including medical care and alternative health practices such as TCM and acupuncture, despite a national organization called the Canadian Association of Traditional Chinese Medicine and Acupuncture (CATCMA) with members residing across Canada. This organization's role is to:

1. develop and support academic programs and research relating to TCM.
2. facilitate international academic exchanges, technical co-operations, and other connections with international academic organizations and scholars.
3. provide opportunities for the academic enrichment of CATCMA members by supporting TCM continuing education.
4. promote the establishment of appropriate policies, regulations, and legislation governing TCM in Canada by ensuing that governments have access to information and input from TCM experts in an open consultative process.
5. ensure that the benefits of CATCMA membership accrue to all, creating a cooperative, friendly, and convivial atmosphere for members, manage CATCMA democratically, promote a spirit of dedication, creativity and rigorous scientific principle; and work toward the overall prosperity and development of TCM and acupuncture.[15]

CATCMA has no power to regulate or accredit practitioners, but is influential in lobbying with federal agencies and supporting provincial bodies in its accreditation. However, there are no national rules in regards to the regulation of TCM and acupuncture in Canada. The five provinces which have regulations are British Columbia (B.C.) and Ontario regulating TCM and acupuncture, while Alberta, Quebec, and Newfoundland & Labrador regulate acupuncture only. Considering that provinces have difference in regulations, it is expected that practitioners have to go through a certified program and are registered to practice TCM and acupuncture in order to practice in these five provinces. In British Columbia, for example, the TCM regulatory association is called The College of Traditional Chinese Medicine Practitioners and Acupuncturists of British Columbia (CTCMPABC). It should be noted that in B.C., the word "college" in Canadian English means not only an educational institutions, but also a regulatory body. The strategic plan of this regulatory body has three goals:

1. To ensure registrants have achieved competence and have a patient relations practice that conforms to the provincial health regulations;
2. To enhance and promote the college role in ensuring that the public is served and to foster collaborative relationships with local, national and international organizations;
3. To enhance organizational effectiveness with oversight of policies, procedures, and processes that meets the standards of the health regulations.[16]

There is no national education policy in Canada since it is a provincial or territorial jurisdiction. However, provinces do try to coordinate their rules and ensure that there is a great deal of uniformity in the practice of TCM. To practice TCM, herbology and acupuncture in Canada, people must complete one of the three educational paths to be eligible for registration:

1. Registered Acupuncturist after completing a 3-year educational program in acupuncture;

2. Registered Traditional Chinese Medicine Practitioner after completing a 4-year program of acupuncture and herbology with restrictions; Doctor of TCM after completing a 5-year program of acupuncture and serology without restrictions;
3. Pass the Pan-Canadian Written and Clinical Case Study Examinations that is organized in the five provinces through the Canadian Alliance of Regulatory Bodies of Traditional Chinese Medicine Practitioners and Acupuncturists (CARB-TCMPA).

5 TCM training in Canada

Two useful websites that describe information on TCM educational programs in Canada can be found on TB - TCM Colleges and Training Programs in Canada and the Canada Higher Education Career Guide.[17,18] The literature on these early training programs is incomplete, because in the past, TCM was called Chinese medicine or Oriental medicine. The use of the term TCM was the result of trying to unify the name by the Chinese government which has been accepted by almost all educational institutions of higher learning in Canada. Some published articles cited that the first TCM training institution started in 1985 or later. However, a source was found to have cited the year 1970 with the Institute of Acupuncture and Oriental Medicine in Toronto, Ontario. The institute was established by Dr. David Lam, an immigrant from China, making it the rightful first school in Canada.[19] With the plethora of TCM training facilities in Canada, it is not a surprise that 51.4% of people have trained in North America, while 44.1% have trained in East Asia.[20] This reinforces the peoples' demand for effective alternative and holistic approaches. In that regard, TCM is viewed positively because it has been thoroughly researched and has been practiced for centuries in China.

College and University TCM programs are based on the criteria of the CARB-TCMPA, which is the national forum and voice of provincial regulatory authorities. The CARB-TCMPA organizes exams that all programs accept and are supported by the five provinces with a regulatory college, while the other provinces and territories will found the lead of the Canadian Association of Traditional Chinese Medicine, which has chapters in every province and territory. Typically, a program at the various training institutes of higher education is similar to that offered by the Pacific Rim College of Traditional Chinese Medicine.[21] The Doctor of Traditional Chinese Medicine at the Pacific Rim College of TCM is a 10-semester program that deeply explores areas of TCM such as psychology, oncology, gerontology, acupuncture detoxification, research, and the classic texts that first recorded the principles of this powerful and ancient system of medicine. The program provides winter, summer, and fall semesters with a total length of 10 semesters. Students could choose to take the courses online or on campus. The program includes 1065 hours of clinical training, and the total training length is expected to be 3840 hours.

6 TCM practice: Elements of Health Centre, Victoria, B.C., Canada

The best way to understand how TCM operates in Canada is to explore the practice and how it works on a day-to-day basis from a patient's experience, and so below was the author's personal experience. As a TCM patient at the Elements of Health Centre in Victoria, B.C., Canada, the atmosphere of the center was more conducive to releasing anxiety. When I was choosing my TCM practitioner, I was drawn to the idea expressed in the vision of health and the approach of TCM:

> "At the Elements of Health Centre, our holistic approach integrates alternative therapies with western medicine, harmonizing the wisdom of traditional practices with the advances of modern science. Our work in this field is joyful and fulfilling; we are especially passionate about empowering our patients to become active participants in their health in order to achieve long-term vitality, balance, and well-being."[22]

In my first consultation with Dr. Harris Fischer, he listened to my concerns and then let me know that we were going to work together to combat the issues I had. He asked me questions about my lifestyle including diet, exercise, sleep pattern, medication, and what my family doctor was doing to help me. He examined me thoroughly and proposed an approach to help me deal with the hypertension that I was concerned about. In that sense he was using methods that benefited what my family doctor proposed, except that the TCM approach was more proactive and based on what I could do rather than just take the medication that my family doctor had me doing. The TCM approach is to use acupuncture, herbal remedies, and so on in strengthening my heart and having a healthier blood flow. The atmosphere at the Elements of Health Centre was very relaxing. The acupuncture on each visit were relaxing and surprisingly invigorating. I began to make lifestyle changes in diet and exercise and take herbal remedies that felt empowering. This TCM regime complemented what my family doctor was doing, except with TCM I felt more empowered with a sense of partnership with Dr. Fisher, which was very different from my family doctor's approach. I was doing more with TCM than just taking medication and monitoring my heart. With TCM I felt listened to, receiving concrete strategies that I could use on a regular basis and built a partnership with the lead of Dr. Fishers to live a healthier life. A posting on the Centre website also struck a chord with me: "I have never felt so heard and supported by any other health practitioners ever before."

7 Conclusion

Knowing more about the history of modern medicine is an important factor in understanding how the modern health care system functions in Canada. The dual system for funding medical care and the appropriateness of having Western medicine and traditional Chinese medicine work hand-in-hand brings together what science tell us about medical effectiveness and what nature provides for best health practice. While TCM was imported to Canada by immigrants who brought it with them from China, it has found acceptance and its place in the Canadian health care system similar to Chinese immigrants making a home for themselves in Canada. With regulations in place that are supported by the federal and provincial governments, those who seek TCM services can be assured that they are getting quality and professional care for their health needs.

Canada has a mosaic of medical bodies, funding agencies, and regulatory systems that are provincially oriented. The larger populated provinces with high levels of immigrants from China have provincial regulations, indicating that there are no specific regulatory bodies in those provinces. The incorporation of TCM as a discipline that students can study in Canada can be found in most of the provinces at institutions of higher learning. The author's impressive experiences as a TCM patient lie in the expertise of TCM practitioner and the setting of Elements of Health Centre. I have received high quality care and can be confident that my insurance company will pay for the services I received from my TCM practitioners as they are respected and considered an equal in their approaches to health and well-being.

Funding

None.

Ethical approval

This study does not contain any studies with human or animal subjects performed by the author.

Author contributions

Honoré France has done the research and writing of the paper.

Conflicts of interest

The author declares no financial or other conflicts of interest.

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Edited by Zhiheng Guo

How to cite this article: France H. TCM in Canada: health care and the importance of alternative medicines that complement medical practice. Chin Med Cult 2022;5:216–220. doi: 10.1097/MC9.0000000000000033.

Research article

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Development of Chinese Medicine Education in the United States: Two Examples of Pacific College of Health and Science New York and Eastern School of Acupuncture and Traditional Medicine

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Abstract

Chinese medicine originated in China and has taken root all over the world. In the United States, Chinese medicine belongs to the category of complementary and alternative medicine and has a history of over 50 years as a recognized profession. The education of Chinese medicine is undoubtedly the foundation for the development and growth of Chinese medicine practice. In this article, we briefly introduced the history of acupuncture profession and its development in the United States. Pacific College of Health and Science New York and Eastern School of Acupuncture and Traditional Medicine were discussed and analyzed. This article aims to discuss two examples of acupuncture schools in the United States to provide an overview of the history and current development of Chinese medicine education in the United States.

Keywords: Acupuncture school; Chinese medicine; Education; United States

1 Introduction

Chinese Medicine (CM) originated in China and spread to Europe in the 17th century. Acupuncture, as an important part of CM, was brought to the United States during the 1800s.[1] After many years of professionalization and legislation, acupuncture, compared to Chinese herbal medicine, has become one of the most popular complementary and alternative medicines in the United States.[2] The US National Health Interview Survey (NHIS) 2007 explored that about 14.01 million Americans have been receiving acupuncture treatment in 2007.[3] As of January 1, 2018, there are 37,886 licensed acupuncturists practice in California (12,135; 32.03%), New York (4438; 11.71%), and Florida (2705; 7.13%),[4] respectively. One hundred and thirty-three diseases, conditions, or symptoms were recognized by the World Health Organization which can benefit from acupuncture.[5] Among the 50 states in the United States, only South Dakota, Oklahoma, and Alabama do not have legislation and regulation on Acupuncture; the rest of the 47 states and the District of Columbia require licensure to be able to practice.[6] However, none of the states has legislation and regulation on Chinese herbal medicine. Herbal products are generally regulated as dietary supplements. Currently, 51 Acupuncture and Oriental Medicine schools throughout the United States have received accreditation and recognition by the Accreditation Commission for Acupuncture and Herbal Medicine (ACAHM).[6] According to ACAHM,[7] California, New York, and Florida are the top three states that have most licensed acupuncturists. They have 13, 3, and 6 accredited Acupuncture and Oriental Medicine schools, respectively. Only education offered by colleges which received the ACAHM accreditation are accepted for licensing in all US states except California, and as the pre-requisite for taking the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) examination. Previous studies have looked at complementary and alternative medicine curriculum in the American medical schools. We have chosen two cases of acupuncture schools in the United States to provide more details of CM education including their school history, curriculum, student and faculty number,

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Chinese Medicine and Culture (2022) 5:4

Received: 31 July 2022; accepted: 31 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000034

teaching clinics, and etc. Previous studies have rarely discussed the history and curriculum of these two schools, and there was no systematic analysis of CM education in the United States. This study aims to discuss and compare these two cases based on the information collected through literature search and interview.

2 History of CM education in the United States

In 1969, the first and only organized acupuncture class in the United States was held at the Institute for Taoist Studies (ITS) in Los Angeles.[8] Ten students sat and learned acupuncture from Dr. Gim Shek Ju who taught an apprenticeship program at the ITS.[9] Dr. William Prensky and Dr. Steven Rosenblatt were two of the 10 students who followed Dr. Ju for over 5 years learning CM and acupuncture. They were two of the earliest non-Asian acupuncturists in the United States. They had played a major role in the development of CM and acupuncture at the beginning of the CM education.[10] They were graduate students in psychology at the University of California, Los Angeles (UCLA), and, during that time they were doing research on pain relief without any big improvement. They were looking for another modality or method that is something new and different from what they were doing. Tai Ji practices were brought to their mind. After studying and discussing a few weeks of Tai Ji with Marshall Hoo, they were introduced to Dr. Gim Shek Ju, and started learning CM and acupuncture in 1969.

Two years later, in 1971, before President Nixon's visit to China, a reporter from the New York Times named James "Scotty" Reston published a seminal article about his experience of receiving acupuncture for abdominal pain due to appendicitis in China.[11] Acupuncture has become the attention of the public and the US medical community. Along with the booming period, Dr. William Prensky and his team founded the National Acupuncture Association (NAA) and helped to draft out the first legislation of practicing acupuncture and accreditation of the first two acupuncture colleges in the United States.[8] California Acupuncture College (CAC) was one of the first accredited educational acupuncture school and eligible for licensure which founded by a group of NAA members in the early 1976.

About the same time frame in the 1970s, auricular acupuncture as another form of practice in the United States was introduced to assist opioid addiction treatment in New York. In the mid-1970s, Dr. Michael Smith who worked at Lincoln Hospital in the South Bronx area of New York was inspired by a research that was done by Chinese neuro-surgeon H.L. Wen about reducing opium withdrawal symptoms by using electrostimulation on ear Lung point.[12] In the early 1990s, Lincoln Detox, a department at Lincoln hospital, started to offer a 2-week training program to certify Acupuncture Detoxification Specialists. This training program allows non-acupuncture practitioners to perform NADA protocol under licensed acupuncturists or medical doctors' supervision.[12,13] As more and more people know about and are learning acupuncture and herbal medicine, a national level credentialing organization was needed in the meantime. The NCCAOM was established in 1982. It is a non-profit organization that serves as a board examination and certification for state-level licensure. According to the state licensure requirements on the NCCAOM website, each state regulatory board has different requirements for licensure. The NCCAOM holds four examinations including the Foundations of Oriental Medicine, Acupuncture with Points Location, Biomedicine, and Chinese Herbology.[14]

The ACAHM, a specialized accreditation agency recognized by the United States Department of Education (USDE), was founded in 1984 to serve as the nationally recognized accrediting agency in acupuncture and East Asian Medicine (EAM) programs and institutions exclusively providing EAM-related programs.[15] In 1990, Clean Needle Technique (CNT) certificate was added for licensure in acupuncture provided by the Council of Colleges of Acupuncture and Herbal Medicine (CCAHM).[16] The CCAHM provides training on assessment and allows for interprofessional collegial sharing of resources but does not act as a regulating body. Each accredited institution is required to perform comprehensive assessment including faculty evaluations. Evaluations are provided by students at the completion of each course offering.

3 Current acupuncture practice in the United States

Acupuncture was firstly legalized in April 1973 in Nevada in the United States. As of 2021, there are a total of 47 states and the District of Columbia that have regulations on acupuncture practice. However, Chinese herbal medicine is only regulated as dietary supplements, so it does not require a license to practice. As only acupuncture is legalized, this section will introduce acupuncture practice instead of the general CM practice.

As of July 14, 2020, according to the New York Labor department, there are 3,986 active licensed acupuncturists providing both physical and mental health care to society. According to the scope of practice for acupuncture in California, for instance, acupuncturists can perform or prescribe the use of Asian massage, acupressure, breathing techniques, exercise, heat, cold, magnets, nutrition, diet, herbs, plant, animal, and mineral products, as well as dietary supplements to promote, maintain, and restore health.[17] In January 2020, Medicare, a government national health insurance program for people aged 65 or older, included acupuncture treatments for chronic lower back pain.[18] More and more mainstream commercial health insurance started to cover acupuncture for pain management, morning sickness, or nausea during

pregnancy or chemotherapy, headache, migraine, anesthesia during surgery, etc. Currently, most acupuncture practices accept insurances that cover acupuncture but paying out-of-pocket is still the major payment method.

To become a licensed acupuncturist in the United States, one needs to find an ACAHM-accredited school and completes the total education hours requirement that applies to the state that one wants to practice. The minimal education hours in acupuncture set by the NCCAOM is 1,905 hours, while California Acupuncture Board requires 3,000 hours. Once finished with the acupuncture and CM program, one can register to participate in the board exam held by NCCAOM or California Acupuncture Licensing Examination (CALE) after obtaining the CNT certificate from CCAHM. CALE is the exam for licensure in California. After passing the required exams, one can apply for an acupuncture license in the respective state of practice. In addition, 60 points of continuing education unit (CEU) are required to renew the NCCAOM certification in a 4-year recertification cycle. Only 27 states require NCCAOM certification for licensure.

4 Acupuncture and Chinese herbal medicine educational programs

In the United States, there are two most common acupuncture-related master's programs - Master of Science in Acupuncture (MSAc) and Master of Science in Traditional Oriental Medicine (MSTOM). Certificate in Chinese herbal medicine (CCHM) is a complementary certificate that helps MSAc holder to practice herbal medicine in the regulated states. For doctorate programs, there are Doctor of Acupuncture (DAc), Doctor of Acupuncture and Chinese Medicine (DACM), and Doctor of Acupuncture and Oriental Medicine (DAOM).[19] For example, the Oregon College of Oriental Medicine (OCOM), DACM enables graduates of master's programs of acupuncture and CM to augment their knowledge, skills, and behaviors to a level consistent with OCOM's entry-level DACM standards.[19] This program allows master students to attain an entry-level doctoral degree which fills the gap of becoming a licensed acupuncturist at master level before proceeding to the terminal and highest level of DAOM. The DAOM program is an advanced clinical doctoral program. Candidates must be licensed active acupuncturists throughout the duration of this program. Some schools offer both English and Mandarin doctorate program. For example, the Five Branches University provides opportunity of international externships in Asian countries.

Each state has a different education requirement. To meet professional education requirement in acupuncture or oriental medicine programs, for example, New York state stipulated that a minimum of 4,050 hours of classroom instruction, supervised clinical experience, and out-of-classroom or out-of-clinic study assignments must be achieved. Professional education requirement varies in different states. Passing the NCCAOM examinations is one of the requirements for licensure in each state, however, meeting the education requirement is the other.

There are currently enough textbooks available in both eastern and western medicine for students to use in their courses. In the past 10 years, there has been a tremendous number of new textbooks written in English or translated from Chinese language. The foundational texts have become standardized for more than 20 years. Supplementary texts on specific topics such as CM Theory have also been recently published.

5 Pacific College of Health and Science-New York Campus

Pacific College of Health and Science (PCHS) is a for-profit private school originally founded in 1986 in San Diego. Its former name was Pacific Institute of Oriental Medicine (PIOM). PIOM only offered acupuncture programs as well as acupuncture and herbal medicine programs when it was established. As PIOM was accredited by CCAHM and the New York State, the school changed its name to Pacific College of Oriental Medicine in 1990. It became the first accredited acupuncture school in New York. As the school expands, its New York and Chicago campuses were founded in 1993 and 2001, respectively.

In 2008, the doctorate program at Pacific College San Diego received its accreditation. In 2010, the Swedish Institute and Pacific College New York were bought by the same owner of Pacific College of Oriental Medicine. It resulted in the merging of acupuncture programs in both schools. The Swedish Institute's acupuncture curriculum was based on Master Jeffrey Yuen's teaching in Classical Chinese Medicine (CCM), whereas the Pacific College's acupuncture curriculum was based on TCM. CCM utilizes the complete channel system which takes ancient cycles and patterns into consideration in diagnosis and treatment. After the merger, the new curriculum which consists of both CCM and TCM is taught only at Pacific College New York campus.

The Pacific College New York was founded by Alex Tiberi and Jack Miller, while the Swedish Institute was family owned since the late 1800s. Paula Eckardt was the former President of Swedish Institute, while Jack Miller is currently the President of PCHS.

As of January 1, 2020, the Pacific College of Oriental Medicine changed its name to the PCHS. The school offers degree programs such as MSAc, MSTOM, Associate of Occupational Studies in Massage Therapies (AOS), Master of Science in Nursing (MSN), and online transitional doctorate programs – Doctor of acupuncture (tDAC) and Doctor of acupuncture and Chinese medicine (tDACM), and online certificate programs in Medicinal Cannabis, Health Coaching, Integrative Public Health, Yoga, and Cosmetic Acupuncture.

Prior to the coronavirus disease 2019 (COVID-19) pandemic, the MSAc, MSTOM, and AOS programs were taught in person. Starting from March 2020, all programs have an online component. Some courses have gone virtual completely while some courses become hybrid. The instructors at PCHS utilize quizzes/examinations, papers, or presentations to measure course outcomes. Students who attend in each course are required to buy specific textbooks by themselves. There are also recommended books as well as other resources stated in the course syllabus for students use as reference for their study. In the MSAc program, students are required to take both western medicine, biology, and the oriental medicine course which account for 30.34%, 1.87%, and 20.97%, respectively.

The school's curriculum for the MSAc program emphasis heavily on student's hands-on experience in the clinical settings. The school has a clinic where the clinical training mainly takes place. There are several offsite clinics that have affiliations with PCHS where students can apply to do their clinical courses outside of the school. As of August 2022, these offsite clinics include the New York Harm Reduction Educators, The Institute for Family Health, Yinova, Kamwo, and Columbia University Health Clinic.

According to the PCHS policy, the instructor must have a master's degree and at least 4 years of experience in the field of teaching and 5 years of experience in clinical supervision in order to teach in the MSAc and MSTOM programs. The program review is conducted by the school faculty governance committees internally. The chairs of every department of the school perform a review of the faculty each trimester. Externally, the American Association of Colleges of Osteopathic Medicine (AACOM) audits the school every 3 years, while the Western Association of Schools and Colleges' Senior College and University Commission audits the school every few years.

Approximately 1,950 students have graduated from MSTOM and MSAc programs. In 2021, PCHS has conducted a survey with graduates. The response showed that 87.6% of the graduates remained practicing in the CM field. As of July 30, 2022, the current student number in MSAc and MSTOM programs at PCHS-NY is 124 and 241. The total student number at PCHS-NY is 1,793.

6 Eastern School of Acupuncture and Traditional Medicine

The Eastern School of Acupuncture and Traditional Medicine (ESATM or the Eastern School) is an institutionally accredited school by ACAHM for both the MSAc and Certificate in Traditional Herbology (CTH) programs.

ESATM was founded in 1997 by Julie Puretz, LAc. Julie intended to establish the Eastern School to introduce the profession of acupuncture in New Jersey.[20] Thus, it was the first acupuncture school in the state. The curriculum was initially modeled after the curriculum of Tri-State College of Acupuncture where she graduated. The school, which is fully accredited by ACAHM, remains the only college of EAM in New Jersey State offering a licensing program before 2021.[7]

In 2015, the ESATM re-conceived the curriculum and changed from seminar style to trimesters. The fall 2016 semester featured a new, expanded curriculum designed to educate and prepare students to be outstanding practitioners in the field of Asian medicine, and hence the institution was approved for the first master's degree in acupuncture in the state of New Jersey.

The college has been active in the CCAHM since its founding in 1997, with the current Dean, Dr. Thomas Kouo, having served for 6 years on the Executive Committee as a representative of the ESATM. Moreover, he served as the past chair of the CCAHM Herb committee. Currently, he is serving as the Vice-President of CCAHM and co-chair of the CCAHM School Clinics Committee. The ESATM has made a concerted effort to be a leader within the field. This effort leads to the subsequent success of establishing community acupuncture and herbal medicine schools. The ESATM began its institutional accreditation with the ACAHM in 2003 and has maintained its accreditation without interruption since then.[7] Prior to 2016, the college offered a master's level Certificate in Acupuncture, and in 2016 the New Jersey Office of the Secretary of Higher Education approved the school's Master of Science degree in Acupuncture, a milestone for the school and for the state.

In addition to its programs, the ESATM has enjoyed a consistently well-attended series of CEU classes held several times per year taught by Kiiko Matsumoto and Jeffrey Yuen. Additionally, ESATM's 2019 Strategic Plan called for an expansion of ESATM's CEU program to create an additional viable revenue stream. With a brief period of inactivity due to the COVID-19 pandemic, the ESATM has enjoyed an expanded program with the Sports Medicine Acupuncture Certification (SMAC) program and the Neuropuncture training held on the campus. These two major programs have attracted other inquiries for CEU offerings that have helped to increase revenues without additional investment of ESATM resources. Practitioners have traveled from all over the country to attend these classes at the ESATM and the school's positive reputation is built through positive exposure and association. When the COVID-19 pandemic closed the state down, the ESATM had been making contingency plans and the institution was able to move to remote classes and clinics without any loss of class time. No staff or faculty missed any days of work due to the state shutdown and the transition to remote operations. Their transition was successful, and their community came together to figure out how to make the best of the online clinic through guided casework

and a modified form of telemedicine that they piloted. When it was safe to do so, the school brought its clinic back to campus and has been back with few interruptions since. Their staff was evacuated from campus early in the pandemic and have learned to work effectively and efficiently from home. As the COVID-19 pandemic is not over, the staff has maintained a half/half presence on campus and working remotely. The Eastern School has shifted its modes of communication from an "open door" policy, to email or ZOOM meeting correspondences. The "open door" policy remains, but the staff is not in the office as much as they used to be.

All of the wonderful changes that the Eastern School has recently adopted stand as a reminder that we must continually work diligently to meet the challenges of a growing school in a dynamic profession. The ESATM lives by the ethic of perpetual work to improve its educational programs and its administrative effectiveness. While the school remains relatively small, each team functions collaboratively and supportively to maintain its solid foundations. The College has a "group process" structure where individuals work as a team to perform educational analysis, foster curriculum revision, and utilize a variety of evaluation methods to assess learning outcomes. Their inter-team communication remains a strength by which they have been able to efficiently adjust and exhibit strong, good judgment in keeping the institution thriving even under difficult circumstances. The self-study process which is based on ACAHM requirements and criteria gives the college a framework within which the entire community participates and grows as a result of their own self-reflective review.

For CM education in these two colleges, there are some similarities and differences in the curriculum (See Table 1). The Eastern School has another CTH program, so it does not have any herbology course in MSAc.

7 Discussion

Over the past 50 years, acupuncture, a typical symbolism of CM, has been recognized by the US federal government as a form of healthcare profession due to the tremendous contributions and efforts of acupuncture professionals. The ancient origins of using herbal medicine in the United States is also indisputable. After the Dietary Supplement Health and Education Act of 1994 was passed and became law, herbal medicine practices were officially legalized.[21] Although herbal products can be traded on the market, they are still not allowed to claim any therapeutic effects. That makes practicing the whole form of CM which contains acupuncture and Chinese herbal medicine in the US challenging. Until today, some states still do not have a clear regulation or law on herbal medicine practice. That is the reason curriculum of acupuncture schools and the licensing process vary in different states in the United States. Meanwhile, acupuncture has become the most recognizable representative of CM.

Acupuncture education has always been a key factor in promoting the development of CM profession. In addition to Chinese mainland the United States also has an organized and influential CM education system to the world.[22,23]

If we classify the curriculum arrangements of the two schools in a modular way, PCHS has the largest number of western medicine courses (16 modules) with the highest credit ratio. It can be seen that PCHS pays great attention to the knowledge of modern medicine in its overall teaching. When students learn acupuncture and traditional medicine, western medicine content needs to be taken into account. In addition, there are 15 clinical courses in PCHS, which ranks the second in the number of modules. The credit hours for clinical courses are as high as 735. This indicates that PCHS attaches great importance to clinical practice. In the ESATM program, the number of courses between Eastern medicine and Western medicine is the same, each has 13 modules, 39 credits, and 585 credit hours. This shows that the school attaches equal importance to Eastern and Western medicine. Similar like PCHS, ESATM also focuses on clinical courses. Having 860.5 credit hours, clinical courses rank first among

Table 1 Comparison of MSAc curriculum settings between PCHS and ESATM

	PCHS					ESATM				
Course category	No. of courses	Units	Credit hours	Hr%	Unit%	No. of courses	Units	Credit hours	Hr%	Unit%
Oriental medicine	10	28	420	16.77	20.97	13	39	585	21.66	25.77
Acupuncture	11	24.5	450	17.96	18.35	9	27	405	15.00	17.84
Western medicine	16	40.5	660	26.35	30.34	13	39	585	21.66	25.77
Body work (Qigong, Tuina)	3	4.5	90	3.59	3.37	4	8	120	4.44	5.29
Clinical	15	26.5	735	29.34	19.85	8	28.7	860.5	31.86	18.96
Business	2	5	75	2.99	3.75	2	6	90	3.33	3.96
Biology	1	2.5	45	1.80	1.87	0	0	0	0.00	0.00
Herbology	1	2	30	1.20	1.50	0	0	0	0.00	0.00
Miscellaneous medical research, integrative medicine, comprehensive exam review)	0	0	0	0	0	3	3.66	55	2.04	2.42
Total	59	133.5	2505			52	151.36	2700.5		

ESATM: Eastern School of Acupuncture and Traditional Medicine; MSAc: Master of Science in Acupuncture; PCHS: Pacific College of Health and Science.

all modules. It is obvious that both schools attach great importance to clinical practice, which reflects the characteristics of CM education, or all medical education. Only with more clinical practice can we combine theory with practice and achieve better learning effects and outcomes. PCHS curriculum includes business course, which is also relatively unique in CM education, so that students can have the basic knowledge of business operation and lay the foundation for independent medical practice or clinic operation after graduation. The biggest difference between the two schools is that PCHS contains a herbology module, while ESATM does not. Herbology at ESATM is an additional course related to the degree in TCM. ESATM contains miscellaneous modules of Medical Research, Integrative Medicine, and Comprehensive Exam Review, while PCHS has no such related modules. In terms of class size, PCHS is a larger school and thus has more students than the smaller ESATM. Additionally, the emphasis on Western Medicine and Integrative Medicine at PCHS is in contrast with the emphasis on CM and traditional medicine practice at ESATM.

The strength of this article is that through investigation and analysis of the two typical and most representative CM schools in the eastern state, we can see that the CM education in the United States, particularly acupuncture education, has entered the localization development. It is foreseeable that the joint efforts of local CM practitioners in promoting legislation and certification, the development of CM in the United States will have a bright future.

The weakness of this article is that due to the limitations of time and human resources, only two CM schools in eastern state have been studied, and some of the views discussed may inevitably be partial. The development of Chinese herbal medicine education is lagging behind compared to acupuncture education, and we expect Chinese herbal medicine to receive more attention in the United States. Therefore, our future research will explore more schools in order to understand and discover more features and highlights of CM education in the United States.

8 Conclusion

Over the past few decades, an estimated 40,000 people have received formal education at acupuncture colleges in the United States. Acupuncture, one of the best growing areas of CM education in the United States, is receiving increasing attention. Acupuncture education has established a solid foundation in the United States. With the clear implementation of doctoral programs and the need for non-pharmacological pain management, acupuncture is likely to play a huge role in the integrated healthcare system in the United States.

Acknowledgments

The authors would like to express their gratitude for the support from Kimberlie Wilson, LAc, DACM, Cynthia Neipris, LAc, DACM and Ashley Kowal, EdD.

Funding

This study is financed by the grant from the school of Acupuncture-Moxibustion and Tuina SHUTCM (No. 2022SHUTCMKCJS060).

Ethical approval

This study does not contain any studies with human or animal subjects performed by any of the authors.

Author contributions

Bin Xiao and Qi-Hui Jin participated in the research design. Qi-Hui Jin, Yan Zhou, Thomas Kouo and Bin Xiao participated in the writing of the paper. Qi-Hui Jin and Yan Zhou participated in the literature retrieval, interview, and survey.

Conflicts of interest

The authors declare no financial or other conflicts of interest.

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Edited by Jiayu Gong

How to cite this article: Jin QH, Zhou Y, Kouo T, Xiao B. Development of Chinese medicine education in the United States: two examples of Pacific College of Health and Science New York and Eastern School of Acupuncture and Traditional Medicine. Chin Med Cult 2022;5:221–227. doi: 10.1097/MC9.0000000000000034.

Research article

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Shen in Acupuncture for Chronic Pain

Yong-Shun Bei✉

Abstract

Chronic pain is one of the major complaints from patients seen in all acupuncture clinics. The most common principle to treat pain with acupuncture is to activate channels to relieve pain; however, little attention has been paid to treating the patient's *shen* when treating their pain. This article is an introduction to the incorporation of the treatment of *shen* when treating chronic pain with acupuncture. The discussion of the *shen* and its treatments in this article are based on the review and study of the theories and principles in the ancient classics of traditional Chinese medicine. *Shen* is the interaction between *yin* and *yang*. *Shen* is the governor of life; it controls all physical and mental activities. *Shen* enables us to feel pain. The disorders of *shen* in pain sufferers can negatively affect how they feel or recognize pain, how they response to pain and how they report their pain level. We should pay more attention to the treatment of patient's *shen* during the entire treatment course of chronic pain. Guarding *shen* is the key to acupuncture efficacy; the essential principles are harmonizing *yin* and *yang* by needling techniques and regulating *hun* and *po* at the needling sites.

Keywords: Acupuncture; Chronic pain; *Hun*; *Po*; *Shen*

1 Introduction

The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage."[1] Pain is unpleasant but the feeling of pain is an adaptive self-protection against further injury and it is a warning sign of actual or potential tissue damage or of more serious issues. Chronic pain refers to pain that lasts or recurs for more than 3 to 6 months.[2] According to data from the Centers for Disease Control and Prevention, in 2019, there were 20.4% of the adult population in the United States suffered from chronic pain and 7.4% of adults whose life and work activities were affected by their chronic pain for at least 3 months.[3]

Chronic pain is one of the major complaints from patients seen in all acupuncture clinics. The most common principle to treat pain with acupuncture is to activate channels to relieve pain; however, little attention has been paid to treating patient's *shen* when treating their pain.

This article is an introduction to the incorporation of the treatment of *shen* when treating chronic pain with acupuncture. The discussion of *shen* and its treatments in this article are based on the review and study of the theories and principles in the ancient classics of traditional Chinese medicine (TCM).

2 Role of *shen* in chronic pain

2.1 *Shen*, the governor of life that makes us be able to feel pain

Shen is the governor of life; it controls all physical and mental activities. *Shen* is defined in Chapter 8 of *Ling Shu* (《灵枢》 *Spiritual Pivot*) that "what the heaven has given me (human) is the *de* (德); what the earth has given me is the *qi*. When the *de* flows and acts on the *qi*, essences (*jing* 精) are created. When two essences (of *yin* and *yang*) clash into each other, it is called *shen* (神). That which comes and goes following the *shen* is the ethereal soul (*hun* 魂); that which enters and leaves together with the essence is the corporeal soul (*po* 魄); that which is responsible for all affairs is called the heart. When the heart reflects on something, that is called intention (*yi* 意); When the intention is stored, that is called will (*zhi* 志); If the will longs for changes, that is called pondering (*si* 思); If the pondering results in far reaching plans, that is called consideration (*lü* 虑); If the considerations guide one's handling of the affairs, that is called wisdom (*zhi* 智)."[4,5]

In other words, *Ling Shu* describes that *shen* is essentially the interaction between y*in* and y*ang*. *Hun* is the pre-existing spirit in the universe and it follows *shen*; it is called the y*ang shen* (阳神). *Po* is the spirit from the

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Chinese Medicine and Culture (2022) 5:4

Received: 27 June 2022; accepted: 30 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000032

essences of *yin* and *yang* and it enters and stays with *shen*; it is called the *yin shen* (阴神). As *shen* is hosted by the heart, we also refer it as the heart *shen*. The intention (*yi* 意), will (*zhi* 志), pondering (*si* 思), consideration (*lü* 虑), and wisdom (*zhi* 智) are derived from the activities of heart *shen*. *Shen* (神), *hun* (魂), *po* (魄) are not parallel with *yi* (意), *zhi* (志), *si* (思), *lü* (虑), and *zhi* (智). This concept is very clearly stated in Chapter 8 of the *Su Wen* (《素问》*Basic Questions*), that the heart is the sovereign of all organs and it governs the *shen* and its associated activities.[6]

Shen enables all physical and mental activities. In TCM, pain is one of the perceptions controlled and conducted by *shen*, or heart *shen*. Chapter 74 of the *Su Wen* states that the symptoms of pain and itch belonged to the disorders of the heart *shen*.[6] So, heart *shen* enables people to feel, recognize, and respond to stimuli and changes that happen to their body and this is the basic understanding of the mechanism of pain in TCM.

2.2 Disorders of *shen* in chronic pain

There is a saying that should resonate with sufferers: pain is fact and fact is pain. Patients' *shen* is involved in their chronic pain. A disorder of *shen* is often present in patients with chronic pain; when a patient has chronic pain, his/her *shen* is not in a normal state.

The perception of pain involves the sufferers' psychological and physical experiences. How much pain a sufferer feels, how much pain he or she reports and how his/her body and mind respond to the pain are based on individual pain threshold and associated physical and mental experiences.

The disorders of *shen* can cause the sufferers to have psychological manifestations. Patients with chronic pain often have accompanying mental and emotional symptoms such as anxiety and/or depression.[7] Furthermore, Chapter 74 of the *Su Wen* states that symptoms of disorientation, confusion, and convulsion belong to the fire (which disturbs the heart). Pain and itching belong to the disorders of the heart where the *shen* dwells.[6]

The disorders of *shen* can also cause the sufferers to have physical responses such as uncoordinated movements, over-tensed muscles and tendons, muscle weakness, decreased range of motion, decreased pain threshold, and etc. These physical manifestations are the results of *shen*'s disorders; they may or may not have a direct connection to the disease that causes the pain. These physical manifestations could misguide a medical diagnosis and, as a result, delay the healing or recovery of the illness that causes the chronic pain.

Patients with a disorder of *shen* can recognize, report/rate, and respond to pain abnormally. Patients with disorders of *shen* can exaggerate or understate the pain level that they experience.

In a nutshell, the disorders of *shen* could distort a person's subjective feelings and perceptions, especially pain. The disorders of *shen* can negatively affect how the patients feel or recognize pain and how they report their pain level.

Shen is the spirit created by the interaction of *yin* and *yang* and there are two kinds of *shen*: the *yang* aspect of *shen* is called *hun,* whereas the *yin* aspect of *shen* is named *po*.[8] The disorder of *shen* can be subdivided into the disorders of *hun* and *po*.

2.2.1 Disorders of hun

Hun, also known as the *yang shen*, is stored in the liver. It controls the functions and feelings from all formless and invisible elements of our body such as *qi*, thoughts, emotions, wisdom, conscience, judgement, and etc. It is stated in Chapter 8 of the *Ling Shu,* that "when grief and sorrow attack the center, this will harm the *hun* soul. The patient will be mad, forgetful, or not witty; his judgements are not proper."[4]

Depression, anxiety, and exaggeration of pain level in patients with chronic pain are related to the disorders of *hun*. A patient with disorder of *hun* usually reports the pain intensity as more severe during daytime. Patients with disorder of *hun* could lack common sense or proper judgement in managing their pain in their daily life. Some patients with the disorder of *hun* could be obsessed with the belief that their diseases are much more severe and much more life-threatening than the actual diagnosis and prognosis.

2.2.2 Disorder of po

Po, also known as the *yin shen*, is stored in the lung. It controls the body's involuntary functions such as heartbeat, blood pressure, body temperature, breathing, coordination of body movements, muscle tension, and pain threshold.

When a patient has a disorder of *po*, he or she is not nimble. The patient may have uncoordinated movement, decreased range of motion of body parts, decreased pain threshold, increased tension in muscles or weakness of muscles, and/or sleep apnea. Patient with the disorder of *po* usually report that the pain intensity is more severe during sleep time at night. It is commonly found that the pain level or the degree of musculoskeletal functions reported by patients with disorder of *po* does not match with their injuries or tissue damages diagnosed by clinical evaluation, diagnostic imaging, and other medical examinations.

3 Principles of treatment of *shen* in acupuncture

The treatment of *shen* should be incorporated in the acupuncture treatments of pain, especially for chronic pain. The goal is to regulate the *shen* back to its normal state.

Chapter 1 of the *Ling Shu* emphasizes the importance of the treatment of *shen* as follows: "The essential of performing acupuncture treatment is easy to talk about but it is difficult to perform. Unrefined practitioners are stuck on the physical appearance of the needling techniques while the outstanding practitioners hold *shen* in their treatments."[4]

Guarding or treating *shen* is the key to an effective treatment for chronic pain. There are many ways to restore the normal state of *shen* but the essential principles are harmonizing the y*in* and y*ang* by needling techniques and regulating the *hun* and *po*.

3.1 Harmonizing *yin* and *yang* by needling techniques

It is stated in Chapter 5 of the *Su Wen*, that the law of *yin* and *yang* is "the natural order of the universe, the foundation of all things and all changes, the root of life and death, and the palace of the *shen*."[6] Furthermore, Chapter 8 of the *Ling Shu* states that *shen* is the interaction of the essences of *yin* and *yang* (the interaction includes the interaction itself and the results of the interactions).[4] Therefore, harmonizing *yin* and *yang* is essential to maintain or restore the normal state of *shen*.

Restoring the normal state of *shen* in each selected point of the acupuncture treatment is the way to restore the normal state of *shen* of the whole body.

The acupuncture points existing on our body are not designed only for acupuncture treatments; each point has its own *shen* and has the function to communicate. The points are specific sites through which the *qi* of the *zang fu* organs and the *qi* of the meridians are transported to the surface of the body so that the *qi* between the exterior and interior of the body, and the *qi* between the body and nature could be connected and be in communication. It is stated in Chapter 1 of the *Ling Shu*, that the so-called points are the locations where the *shen qi* passes, exits and enters.[4] Each point is a very important gateway for the communication of *shen* between the interior and exterior of the body and also between the body and nature. Therefore, and more importantly, our body is part of the whole universe.

When the *shen* of a point is not normal, it manifests itself as a disorder of its corresponding *zang fu* organ systems, and the abnormal state can cause miscommunication between the body and nature on the *shen* level. Chapter 68 of the *Su Wen* further states that when the passing (ascending and descending), exiting, and entering movements are disabled, the generating and transforming of *shen* (*shen ji* 神机) will be destroyed, and the setting up of *qi* (*qi li* 气立) will be secluded and destructed.[6]

It is essential to use proper needling technique to normalize the *shen*. There are many needling techniques taught in the TCM ancient classics, ancient books, and modern lectures. No matter which needling technique is employed, the goal is to normalize the *shen* by harmonizing the *yin* and *yang* at each selected point.

The principle of the needling technique for treating the *shen* is described in Chapter 9 of the *Ling Shu*, that the meaning of *de qi* (*qi* arrival 得气) is to make the *yang qi* move to the deep and to bring the *yin qi* to the shallow to make a good communication and interaction between the *yin* and *yang*, hence the *shen qi* is guarded and the evil *qi* stopped.[4]

3.2 Regulating the *hun* and *po*

Liver hosts the *hun*. Any pathological disorders of the liver can result in the dysfunction of the *hun*. When treating and regulating the *hun* in patients with chronic pain, we should focus on the liver. Soothing the liver, clearing the liver heat, and nourishing the liver blood are common treatment methods to regulate the liver and, therefore, to restore its normal hosting function of the *hun*.

Lung hosts the *po*. Any pathological changes of the lung such as lung *qi* deficiency, lung *yin* deficiency, invasion of the lung by cold, and etc. will cause malfunctions of the lung in hosting *po*. When treating and regulating the *po*, we should focus on the treatment of lung's descending and dispersing functions. Tonifying the lung *qi*, nourishing the lung *yin*, dispelling cold from the lung are the most common treatment methods.

4 Practice of treating the *shen* in acupuncture

4.1 Specific points used for the treatment of *shen*

Although all acupuncture points are the sites where *shen qi* passes, exits, and enters, some of them are specifically associated with the *shen*, *hun*, or *po* of the whole body. Using these acupuncture points is helpful to treat *shen* in general.

It is difficult to discuss the systematic application of points for the treatment of *shen* of the whole body since the records of such treatment in the TCM ancient classics are scattered and not well explained. This article only provides a list of points (Table 1) with names that give clues that they could be beneficial for the treatment of *shen*.

4.2 Needling techniques for the treatment of *shen*

In the acupuncture treatment of *shen*, the principle of needling technique is to restore the normal state of *shen* in each selected point as discussed in the Section 2.1.

In question number 48 of the *Nan Jing* (《难经》 *The Classic of Difficult Issues*), it is stated that a person may have three kinds of deficiency and three kinds of excess.[9] "Three" in this statement refers to "many." A TCM syndrome identification is a comprehensive conclusion which describes the root cause of an illness.

Table 1 Suggested acupuncture points

Name	Meaning of name	Functions of point
Shenmen (神门 HT 7)	Door of the *shen*	Nourish heart and calm *shen*
Pohu (魄户 BL 42)	House of *po*	Clear lung and calm *po*
Shentang (神堂BL 44)	Hall of *shen*	Clear heart and calm *shen*
Hunmen (魂门 BL 47)	Door of *hun*	Nourish liver and calm *hun*
Yishe (意舍 BL 49)	House of thoughts	Strengthen spleen and clear thoughts
Zhishi (志室 BL 52)	House of will power	Tonify kidney and strengthen will power
Benshen (本神 GB 13)	Origin of *shen*	Regulate and calm *shen*
Dazhong (大钟 KI 4)	Great bell (in a Buddhist temple)	Arrest *po* and awake *hun*
Zhubin (筑宾 KI 9)	Playing music to entertain guests	Relieve depression and restore *hun*
Shenfeng (神封 KI 23)	Domain of *shen*	Regulate and calm *shen*
Lingxu (灵墟 KI 24)	City of *shen* in ancient time	Regulate and restore *shen*
Shencang (神藏 KI 25)	Vault of *shen*	Restore *shen*
Lingtai (灵台 DU 10)	Stage of *shen*	Clear mind and calm *shen*
Shendao (神道 DU 11)	Passage of *shen*	Clear mind and calm *shen*
Shenting (神庭 DU 24)	Courtyard of *shen*	Clear mind and calm *shen*
Dadun (大敦 LV 1)	Great management	Sooth liver and calm *hun*
Xingjian (行间 LV 2)	Walking between	Clear liver heat and calm *hun*
Taichong (太冲 LV 3)	Great rushing (of blood)	Nourish liver blood and foster *hun*
Zhangmen (章门 LV 13)	Door to management	Clear liver, remove liver stagnation, and calm *hun*
Tianfu (天府 LU 3)	Palace of heaven	Promote lung's dispersing and descending functions, calm *po*
Xiabai (侠白 LU 4)	A knight fighting for the west	Clear lung and restore *po*
Jianshi (间使 PC 5)	Order to clear boundaries	Calm mind, regulate *shen*

Whether a patient has been diagnosed with a deficient or excess syndrome, the *shen* state of each acupuncture point on this patient is independent of his/her syndrome identification and it could be in a deficient or an excess state itself. The *shen* state of each point may or may not match with the syndrome identification of the patient's illness. For example, Taixi (太溪 KI 3) could be in a deficient state (soft) on a patient with low back pain due to *qi* and blood stagnation (an excess syndrome identification). Restoring the normal state of *shen* of the point selected for the treatment is the key.

4.2.1 Step 1: Palpating to determine the state of shen in each selected point

The practitioner should palpate the point to detect and determine the state of *shen* of that point before needling. In general, the state of *shen* in a selected point can be put into two categories: deficiency and excess. If the practitioner perceives softness like pressing a cotton ball and the patient feels itchiness, comfort or pleasure under pressing, it usually indicates that the *shen* in this point is in a deficient state. If the practitioner feels firmness or a nodule when pressing, and the patient feels pain or uneasy, it usually indicates that the *shen* in this point is in an excess state.

The needling technique to be employed on a selected point should be based on the state of *shen* of this point.

4.2.2 Step 2: Tonifying deficiency and reducing excess

It is stated in Chapter 3 of the *Ling Shu* that an outstanding practitioner guards the *shen* by tonifying insufficiency and reducing excess.[4] It is essential to apply tonification needling technique for deficiency and reduction needling technique for excess to restore the normal state of *shen* in each and all selected points in a treatment. There are many acupuncture needling techniques for tonification and reduction. Among them, the needling techniques from *Nan Jing* best meet the principles discussed in the Section 3.1.

The tonification and reduction needling techniques are described in question number 76 of the *Nan Jing*. It states that "getting *qi* from the *wei* (defensive level 卫) for tonification and getting *qi* from the *ying* (nutrient level 营) for reduction. The key is to bridge the communication between the *ying* (nutrient) and *wei* (defense)."[4] This statement can be considered as the basic needling technique to restore the normal state of *shen*. Both tonification and reduction needling techniques can be broken down into three steps.

1) Tonification needling technique
   Step 1: Inserting needle into the *wei* (defensive) level and twisting the needle gently and subtly clockwise to obtain *de qi* (*qi* arrival).
   Step 2: Holding *de qi* (*qi* arrival) and pushing the needle to the *ying* (nutrient) level.
   Step 3: Releasing *de qi* (*qi* arrival) by twisting needle gently and subtly counter-clockwise.
2) Reduction needling technique
   Step 1: Inserting and pushing needle into the *ying* (nutrient) level.
   Step 2: Twisting the needle gently and subtly clockwise to obtain *de qi* (*qi* arrival).
   Step 3: Holding *de qi* (*qi* arrival) and pulling the needle back to the *wei* (defensive) level and releasing *de qi* (*qi* arrival) by twisting needle gently and subtly counter-clockwise.

4.3 Clinical case

4.3.1 Patient's I.D.

Age: 62
Gender: male
Source: self-reported; reliable

4.3.2 Patient's description

A 62-year-old man described his chief complaint as pain from his skin rashes on his abdomen, subcostal region, and back, along the 10th to 12th ribs on his right side. The pain started 3.5 months ago. He described the pain as burning, aching, sharp, and sudden like an electric shock. The pain was more severe during sleep at night.

The patient also stated that he is moody and depressed, has a poor appetite, has irregular bowel movements which were loose, watery, and sometimes unexpectedly urgent, and his sleep is disturbed by the pain.

4.3.3 History of present illness

Patient stated that he started to experience pain and skin rashes with blisters about 3.5 months prior to his first visit in my office. Through clinical findings and polymerase chain reaction (PCR) test, herpes zoster was the diagnosis given by the patient's neurologist. On the 3rd day after the onset, patient started taking 7 days of acyclovir and 14 days of prednisone. The skin rashes and blisters had faded with the medications, but the pain remained. At the time of his first visit, the patient was taking 300 mg of gabapentin (2–3 times a day) for his pain, but he stated that his pain was scored 9 out of 10 on the Visual Analogue Scale (VAS).

4.3.4 Physical examination

On his first visit, physical examination revealed a body temperature of 36.3°C, heart rate 72 beats per minute and blood pressure 120/82 mmHg. It was observed that the patient's rashes were not fresh, and covered his abdomen, subcostal region, and back, along the 10th to 12th ribs on his right side. The lesions on his abdomen, subcostal region, and back were very sensitive to touch, including his clothing and light palpation. Patient's complexion was pale with a painful expression.

His tongue was pale-purple and dull in color, but the tip of his tongue was red. The tongue body was enlarged with teeth marks on both sides. The coating was white and moist. His pulse was thready, wiry, and slippery on both sides.

4.3.5 Lab and diagnostic test results

A PCR test for Varicella Zoaster Virus (VZV) was performed 3.5 months ago. It was positive.

4.3.6 Assessment/treatment

1) Integrative diagnosis: The diagnosis of his condition was postherpetic neuralgia (PHN). The diagnosis of PHN is determined mainly by clinical symptoms, physical exams, and a positive VZV PCR result. Based on the patient's presenting symptoms and signs along with the characteristics of the tongue and pulse, the TCM syndrome differentiation for the patient's condition was *qi* and blood stagnation with disharmony of the liver and spleen and disorders of the *hun* and *po*.
2) Treatment plan: The treatment principle was to regulate the liver, strengthen the spleen, activate the *qi* and blood and regulate the *hun* and *po* to relieve pain.

Taodao (陶道 DU 13), Pishu (脾俞 BL 20), Pohu (魄户 BL 42), Hunmen (魂门 BL 47), Taichong (太冲 LV 3), and Zhigou (支沟 SJ 6) were the major point selections for treatment. Filiform needles were used on all points. *Nan Jing*–based tonification and reduction needling techniques discussed above were employed based on the state of *shen* in each point. He received acupuncture treatments twice a week for 3 weeks, then once a week for 5 weeks.

4.3.7 Outcome

After the 3rd treatment, his pain had decreased from 9 to 4 to 5 on the VAS. The patient's primary care doctor approved reducing 300 mg gabapentin from 2 to 3 times a day to once a day before bedtime. On his 5th visit, patient reported that the pain level was 2 to 3 on VAS. He had stopped taking gabapentin after consulting with his primary care physician. On his 10th visit, patient reported that there was no pain on the right side of his body where the rashes were. It was observed that the skin rashes had faded although some marks remained. He reported that his sleeping, digestion, energy and mood had improved significantly. The patient was discharged after his 11th visit.

In this case, the patient's disorders of *hun* and *po* were addressed in his TCM syndrome identification. The treatment of *shen*, especially through the treatment of *hun* and *po*, was emphasized in acupuncture treatment. The point selections and needling techniques also followed the principle of the treatment of *shen*. The result was satisfactory.

5 Conclusion

It is stated in Chapter 73 of the *Ling Shu*, that "it is essential not to neglect *shen* in order to apply (acupuncture) needles successfully."[10] We should pay more attention to the disorders of *shen*, *hun*, and *po*, throughout the entire course of acupuncture treatment including clinical evaluation, treatment principle, point selections, and needling techniques. While treating a patient with chronic

pain, the acupuncture treatment would be more effective if the treatments of *shen* (*hun* and *po*) is incorporated.

Funding

None.

Ethical approval

This study does not contain any studies with human or animal subjects performed by the author.

Author contributions

Yong-Shun Bei wrote and revised this paper.

Conflicts of interest

The author declares no financial or other conflicts of interest.

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Edited by Lin Su

How to cite this article: Bei YS. Shen in acupuncture for chronic pain. Chin Med Cult 2022;5:228–233. doi: 10.1097/MC9.0000000000000032.

Research Article

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Production of Chinese Medicinal Herbs in North America: Challenge and Reconciliation

Jean Giblette✉

Abstract

As the practice of traditional Chinese medicine developed in the United States since the 1970s, evidence has accumulated suggesting that an undetermined number of the herbs of the Chinese *Materia Medica* could be produced in North America. While some attempts have been made to establish production, growers are inhibited by lack of access to capital and technical support. The evidence in support of US domestic production – including (1) historical, (2) sociological, (3) ecological, and (4) agronomic factors – is reviewed. Economic obstacles to this type of production are described, as directly experienced by the farmers, Chinese herbal medicine practitioners, and organizers involved. When analyzed in reference to current trends, however, these economic obstacles appear, at least potentially, as temporary. Because popular demand supported the rise of traditional Chinese medicine practice and the growth of organic food production, these social movements could expand and promote conditions that favor domestic production of Chinese herbs.

Keywords: Chinese herbal medicine; Chinese Materia Medica; Ecological agriculture

1 Introduction

Since 1990, in the direct experience of the author and her colleagues, a small social network of Chinese herbal medicine practitioners, horticulturalists, and farmers in the United States (US) has investigated agricultural production of a few hundred of the plant species listed in the Chinese *Materia Medica*.[1]

A strong rationale with phyto-geographical, historical, and cultural roots supports these efforts. Changes in medical philosophies along with parallel changes in attitudes toward food and farming have occurred in the past 50 years. However, economic obstacles encumber farmers who would undertake production. This is a current problem without an apparent solution, yet impending changes may bring about a favorable resolution that will further the worldwide acceptance of traditional Chinese medicine (TCM).

The historical context as well as ecological and agronomic factors of this problem are described as follows. Economic barriers are analyzed and, in conclusion, prospects for development of this emerging industry are assessed.

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Chinese Medicine and Culture (2022) 5:4

Received: 28 July 2022; accepted: 31 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000037

2 Historical context: the loss and reclamation of botanical medicine in the United States

Native Americans possessed extensive knowledge of medicinal plants that continues to be a focus of study.[2] After the European colonization of North America, botanical medicine was practiced widely, with schools such as the Thomsonians and the Eclectics established during the 19th century.[3]

By the early 20th century, public health victories over various epidemics and the rise of the American Medical Association led to a restructuring of medical education. In 1910, the Carnegie Foundation commissioned a report from educator Abraham Flexner concerning the quality of American medical schools. The resultant Flexner Report advised that only schools adhering to an orthodox definition of science should be supported by private foundation funding.[4] Botanical medicine was considered to be folklore, therefore unscientific. Based on this recommendation, divergent forms of medical education began to disappear. The last college of Eclectic Medicine closed in the 1930s.[5] Without market demand for the herbs used in botanical medicine, there was no motivation for farmers to cultivate these plants.

German physician and scientist Paul Ehrlich (1854–1915) introduced an arsphenamine compound in 1906, leading the way for pharmaceuticals. The first Pure Food and Drug Act, passed by the US Congress that same year, recognized the pharmacopeia standards. Botanicals became a minority in the US Pharmacopeia by 1910,[6] with wholly synthetic drugs dominant by 1950.

A popular reaction to the established practice of medicine occurred in the United States during the 1960s. Various practices that arose in the 19th century were recalled and brought forward, including homeopathy and osteopathy. Grassroots interest in herbalism was influenced by writers who recalled the old ways such as Jethro Kloss (1863–1946) whose popular book *Back to Eden* was self-published in 1939 and then re-published by others several times.[7] Many people began to search for alternatives to pharmaceutical medicine and industrial agriculture. Within this social context, botanical medicine was reclaimed and the popular acceptance of traditional Chinese medicine took form.

3 Sociological context: the rise of traditional Chinese medicine

Acupuncture was recognized in the 19th century, studied by a few European and American physicians of the time.[8] However, it was primarily Chinese immigrants who brought a more complete set of traditional medicine skills and herbal materials to North America. An outstanding example is Dr. Ing Hay (1862–1952) who operated a clinic in eastern Oregon beginning in the 1880s. His wooden clinic building, complete with herbs and artifacts, remained intact in the dry climate and is now maintained as a National Historic Landmark.[9]

The process of adoption of acupuncture in the United States, with Chinese herbal medicine added on later, may seem peculiar to those familiar with TCM in China. The practice of acupuncture attracted widespread public attention in 1971 when an American journalist, traveling in advance of President Nixon's trip to China, was hospitalized with appendicitis, treated with acupuncture, and wrote an article about his experience published in the *New York Times*.[10] After that sensational report, medical doctors (MDs) were among the early adopters of acupuncture in the United States. As their training and historical bias favored "scientific" medicine, they discounted herbs as folklore. Nearly two decades passed before Chinese herbal medicine and dietary therapy received appropriate recognition as central to TCM.

A few young American scholars studied in Macau and Taiwan of China during the 1970s and brought back a more holistic picture of traditional Chinese medicine. In 1986, the first English translation of the Chinese *Materia Medica* was published in the United States.[11] Soon after, the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) created the national certification exam in Chinese herbal medicine. Currently, three separate certifications are recognized by the US Department of Education: in Acupuncture, Chinese Herbology, and Oriental Medicine.[12]

The first colleges of acupuncture were founded in Maryland and Massachusetts in the early 1970s. At present the Council of Colleges of Acupuncture and Herbal Medicine (CCAHM) lists 52 accredited colleges in 21 states.[13]

In the US, the states license health professionals. The first acupuncture practice law was enacted in Nevada in 1973.[14] Earlier practice laws focused on acupuncture; some of these were subsequently amended to include Chinese herbal medicine. Over the past thirty years, the number of states with practice laws has increased from 22 to 47 (plus the District of Columbia). Now, two-thirds of the state laws incorporate Chinese herbal medicine in the scope of practice.[15]

After the 1994 Dietary Supplement Health and Education Act (DSHEA) of the US Congress, which amended the *Food and Drug Act*, herbs were defined as dietary supplements. Licensed acupuncturists, even without certification in Chinese Herbology, were allowed to recommend dietary supplements. However, they are advised not to make claims in advertising that the herbs can mitigate, treat, or cure disease or symptoms.[16]

To Chinese practitioners of TCM, the blurring of certification status, together with the diversity in state practice laws, may appear inharmonious. To Americans considering the prospect of domestic production of Chinese herbs, the ambiguity reduces to the problem of market research needed to determine what portion of the huge dietary supplement market consists of herbs dispensed by Chinese herbal medicine clinicians to their patients.[17]

Since the early 1990s, the number of licensed practitioners of TCM increased nearly 700 percent, from approximately 5,500 to 38,000.[18] This growth was fueled by popular demand with treatments paid out-of-pocket. At present, only a few medical insurance companies reimburse acupuncture treatments.

A current preferred term for US practitioners is not necessarily TCM but also East Asian Medicine (EAM), incorporating the Korean and Japanese variants. The phrase "Chinese herbal medicine," however, persists in the nomenclature despite differences in certification status.

4 Ecological basis of the Chinese *Materia Medica* in North America

Since the time of Carl Linnaeus (1707–1778), botanists have recognized a remarkable similarity in the flora of eastern Asia and eastern North America.[19] Hypotheses regarding this geographical distribution anomaly point to disruption of a continuous range of species due to glaciation, beginning about two million years ago.[20]

These floristic relationships are highly relevant to the potential for North American production of Chinese medicinal species, because the plant genera are familiar to farmers and horticulturalists. The ecological niches in which these plants thrive are well known and widely distributed on the continent.

At least some of the analogous species have been used for similar medicinal purposes by the Chinese and Native Americans. In 1985 two botanists who traveled extensively in China compared databases of usage and identified 130 genera with vicariad species (eg, Arisaema, Coptis, Nepeta, and Tsuga), then published a two-volume reference set.[21]

Today, several Chinese herbal medicine practitioners in the United States have voiced the opinion that the analog species be tested clinically as substitutes for the Asian species. If herbal products produced domestically are accepted for clinical use, then a systematic test of North American analog substitutes is possible. Conditions of scarcity could prompt such investigations.

The US growers network, over the years, has developed a list of 150 species that are prioritized for production. This unpublished list is in draft form, circulated among the grower network, and is considered proprietary. The priority factors include: availability of reliably identified germplasm, suitability to various ecological niches available on member farms, and the level of interest or demand among the customer base. Priority species can be adapted to the wide range of production systems available on American organic farms.

Half of the 150 priority species were present in the United States prior to 1990. These include analog species accepted in the Chinese *Materia Medica*, such as Chui Xu Shang Lu (垂序商陆 *Phytolacca americana* L.) or Mei Guo Ling Xiao [美国凌霄 *Campsis radicans* (L.) Seem].

Of those species present but not currently listed in the Chinese *Materia Medica*, the active constituents and clinical efficacy of the medicinal portions have yet to be tested. The lack of research and data is a component of the economic obstacles to the development of production.

Many of the species are maintained in botanical garden collections. These specimens provide a potential source of germplasm to enable clinical research. Others were introduced as ornamentals or for other uses. A few of these in the last category escaped from management in the 19th or early 20th century and naturalized, gradually becoming notorious invasives, such as Ge Gen/Hua [葛根/花 *Pueraria montana* var. *lobata* (Willd.) Maesen & S. M. Almeida ex Sanjappa & Predeep] or Hu Zhang (虎杖 *Reynoutria japonica* Houttuyn).

5 Agronomic context: changes in US agriculture

Synchronous with popular acceptance of Chinese herbal medicine in the United States, knowledge of the failures of industrial agriculture based on toxic chemicals became widespread. The public was shocked by the publication of Rachel Carson's *Silent Spring* in 1962.[22] The resulting popular environmental movement included a number of idealistic young people, some without much experience in farming, who went "back to the land" and founded organic agriculture as it exists today.[23]

Organic or ecological agriculture drew on earlier scientific reports. Franklin H. King's *Farmers of Forty Centuries* published in 1911 was, and continues to be, an important influence.[24] Thanks to early advocates, this book has never gone out of print. Dr. King (1848–1911) was a scientist with the US Department of Agriculture who traveled to China, Korea, and Japan to document long-standing ecological farming methods. He described an ancient system of agriculture, without the use of toxic chemicals, that now is being updated for contemporary needs. Sir Albert Howard (1873–1947) was another prophet of organic farming, a British scientist who worked in India and was influenced by Chinese ecological agriculture.

Thus, the impetus for US domestic production of Chinese medicinal herbs comes from two convergent cultural streams, traditional medicine and traditional agriculture, both originating in China.

This synchronous revival of traditional practices is due to expanding knowledge of the complexity of natural systems, and how they are negatively impacted by toxic chemicals. Food production methods and government dietary recommendations have been constantly challenged during the past half-century. For example, questions regarding the practice of pasteurization have led to a campaign for raw milk resulting in some form of legal access in most states.[25] Substantial popular resistance to products highly profitable for industrial agriculture, such as genetically modified soybeans (94% of soy acreage[26]) and margarine (trans fats), continues to support demand for organically grown food.

If Americans question the use of toxic chemicals in their food supply, they tend to be more likely to question synthetic chemicals used as medicine and become motivated to seek alternatives in the form of dietary supplements and herbal medicine.

Doubts remain concerning the reliability of organic certification itself.[27] These uncertainties led to yet another popular movement known as "localism" or "know your farmer." Various forms of direct marketing continue to reinforce this value, including farmers' markets and Community Supported Agriculture.[28]

Agriculture is an applied science, like medicine. In the last 50 years, ecological methods were retrieved from past experience, tested, and modified by these organic farmers in a popular, grassroots movement. Not only were their pest problems few despite the organic prohibition on the use of toxic chemicals but also the quality of their direct-marketed products gained repeat customers. Lower costs and higher prices made small farms more profitable.

Constant growth of the organic food industry, during US economic recessions in each decade since 1970 to the present, is sustained by popular demand. US organic

sales resumed double-digit annual growth in 2020 when the COVID-19 lockdowns led to more cooking at home.[29]

The significance of the organic agriculture and localism developments for US production of Chinese medicinal herbs rests on farmer innovation and popular acceptance. The response of the land grant (agricultural) university system, state and federal governments has been uneven and insufficient, as described in the next section.[30]

6 Economic obstacles to domestic production of chinese herbs

Access to capital for farming operations has been a constant problem in the US since the European colonization. Commodity export crops, originally cotton and tobacco, remain the center of the national farm economy while specialty crops continue to receive little public support. For example, the current US Farm Bill, 2019–2023, funds commodity programs at $30 billion while the Specialty Crop Block Grant Program is at $425 million.[31]

The population of the US was primarily rural until the 20th century; family farms grew their own food crops and traded locally. Currently, there are approximately two million farms in the United States, only one-third the number before World War Two. Ninety-eight percent of current farms are family-owned; 90% are small and own 49% of the land in agriculture. Of small farms, 41.4% have a family member working off farm and 10.7% are owned by retired people.[32]

These statistics indicate that choices of crops and cropping systems are made by individual farm families, some of whom can afford long-term planning for an income stream from a perennial crop.

In the herbal products industry during the 1990s, a boom followed by a steep decline resulted in losses to some US farmers. In response, representatives of several medicinal herb growers associations began a discussion series to share information and find solutions to problems.

They investigated Chinese herbs as a means to avoid exploitation by product makers, and concluded that direct marketing of their agricultural products (bulk herbs) to licensed clinicians could become profitable but only in the long term.[33] Subsequent efforts to implement this concept involved nine farmer groups in California, Illinois, Minnesota, North Carolina, New Mexico, New York, Virginia, Washington, and West Virginia (in the author's experience).

Only two of these, in California and New York, have survived. Recruitment of farmers interested in experimentation, typically small-scale specialty crop growers, has not been difficult. Retention of those growers over the multi-year period needed to establish production of perennial crops proves difficult.

Cooperative groups are deemed necessary to provide mutual education and support, to obtain funding from public and private sources, and to grow a wide variety of crops. Hundreds of Chinese bulk herbs imported by trusted sources are available online to US clinicians, who are trained to use herbs in formulas rather than as singles. To be credible to this market segment, farmers must present a substantial array of varieties with the promise of future additions. One farm may grow one or a few species as part of a diversified operation, but a group of farms can produce more varieties and also share propagation and processing costs.

The network of growers has received short-term financial support from state, federal and private sources. However, agricultural funding policies are directed toward job creation, annual crops, and documented results within one or two years. Grower groups have been pressured by funding agencies to make financial outlays that cannot be sustained over time. For example, a funding agency prioritized job creation which led to the hiring of employees before crop revenue was sufficient to cover expenditures. Another agency awarded funds to support the construction of processing facilities that required ongoing maintenance, while harvests were years in the future.

In the United States, agricultural cooperatives tend to fail at the beginning of the enterprise because they cannot produce enough volume to employ a coordinator. Perennial crop growers are especially vulnerable. For Chinese herb production, effective coordination is necessary to sustain farmers' interest and commitment over many years while this emerging industry connects with its market.

In this type of agricultural enterprise, capitalization includes the farmer's time to absorb knowledge of new crops, to experiment with production techniques, and to commit labor, land and facilities to the effort. This economic activity is usually not paid in cash although it can be quantified. The cash deficit ultimately limits participation. If the enterprise is a cooperative group, its coordination and marketing costs are extra and usually paid in advance.

At present, production volumes of US-grown Chinese medicinal herbs are very small, as groups operate without sufficient access to capital while the means to connect with the market are being tested. Strategies to overcome such obstacles are matters for debate without an apparent resolution. Also unclear, the degree to which US production will serve domestic demand, much less meet export standards, has yet to be determined.

7 Prospects for development of US production of chinese herbs

Although Chinese herb growers in the United States are hard-pressed to overcome the obstacles they face, several long-term trends can be identified that could alter the

framework of the problem. These trends include continued innovation in agriculture, increasing acceptance and support from the market, disruption of supply lines for imported products whether from scarcity or increased costs.

7.1 Continued innovation in agriculture

Although Chinese herbs are a small niche category of specialty crops, farmers who are growing these herbs cite two main features of interest: ecological benefits, especially relevant to perennial crops, and long-term economic diversification. Farmers are often motivated to persist despite obstacles to preserve the farm for their children. They are aware that perennial crops or permanent agriculture is equity: wealth banked in the land or capital formation without money.

The ecological benefits of perennial polyculture are becoming more apparent. A leading edge of innovation provides new models of farming conducive to new crop development, including Chinese medicinal herbs. Regenerative practices restore the soil's health, its capacity to hold water, and its fertility. A key tenet of regenerative farming is to maximize the presence of living roots in the soil. Perennial plants take on ecological value in such systems.

A second general area of innovation is a renewed interest in agroforestry, which includes many different practices. Understory plants, shade perennials and, of course, trees, and shrubs are desirable and useful crops. As per Table 1, of the grower network's priority crops, 62 of the 150 have potential for agroforestry operations.

Perennial crops are receiving increased attention from ecologists and researchers concerned with carbon sequestration as a mitigant of climate change. For example, several species of Chinese medicinal plants are included in an extensive list of economically valuable perennial crops cited in a recent handbook, *The Carbon Farming Solution*.[34]

Although the acreage devoted to such innovations is a small fraction of the current agricultural picture, if these lines of development are continued US agriculture will increasingly resemble Native American farming practices. Perennial crop operations were once standard practice, as revealed in late 20th century archeological findings of pre-Columbian agriculture in the Ohio and Mississippi River basins.[35]

Table 1 Characteristics of 150 priority species of the grower network

Characteristics of 150 priority species		
Full sun herbaceous perennial	65	43.3%
Shade herbaceous perennial	20	13.3%
Woody shrub or vine	21	14.0%
Tree	21	14.0%
Annual or biennial species	23	15.3%

Percentages do not add up to 100% due to rounding.

7.2 Increased acceptance and support from the market

Chinese herbal medicine practitioners in the United States have benefitted from the low cost and reliability of goods imported from China. A handful of importers sell only to the profession and have a long-standing reputation for quality and safety. Most practitioners rely on pre-packaged formulas made in China to enhance patient compliance. However, they do have access to dispensaries that take orders for formulas compounded from bulk herbs, then shipped directly to the patient.

While imports remain at low cost, acceptance of domestic production is limited. The growers network has received some acknowledgment and support from the EAM profession, but is far from winning general acceptance. Concerns over quality of the herbs, together with distrust of organic certification, are applicable to domestically grown products as well as the imported. To attract the market with quality, freshness, and a wide selection is necessary but insufficient. The cost factor will be the driver that leads to increasing interest in domestic production.

7.3 Disruption of supply lines

The continued worldwide acceptance of TCM, now in over 100 countries, cannot be sustained without more widely distributed production of the herbs. China has begun to import herbs from neighboring countries. For example, Gan Cao (甘草 *Glycyrrhiza uralensis* Fisch. ex DC.) is a nationally protected species of which only twenty percent of needs are supplied through cultivation.[36]

Conservation imperatives include preservation of wild medicinal plants. However, cultivation using industrial methods with toxic chemicals that kill soil biology often results in an inferior product, leading to increased pressure on wild stocks. Ecological production is the answer to that dilemma. Recent research suggests that the soil microbiome helps plants adapt to a new location,[37] a boon to distributed production.

More immediate concerns over supply lines have surfaced within the last two years. Beyond US tariffs on goods from China, the price of shipping container rental increased abruptly along with rising prices for fuels. US importers of the herbs worry also about the continued effects of COVID-19 lockdowns on production in China.[38]

The costs of global trade based on long-distance transport could prompt a re-evaluation of the potential for distributed, US-based production. The cost factor may converge with demand for clean, ecologically grown products and local control over certification. In a highly dynamic, unstable world economy, US growers eventually could become major producers by default.

8 Conclusion

The concurrent establishment of traditional Chinese medicine and organic agriculture in the United States during the past half-century was a result of popular movements. People sought alternatives to conventional medical practice and industrial agriculture, and banded together to found new institutions. Interest in the domestic production of Chinese medicinal herbs grew out of these movements, encouraged by ecological and agronomic factors.

Cooperative associations were formed to produce the herbs, but were constrained by a chronic insufficiency of financial capital. Only two of these groups remain, their production volume is very small, and they continue to face economic obstacles to further development.

Current trends could alter economic conditions in favor of distributed ecological production. Continued innovation in farming methods, increased acceptance of domestically grown products by the primary market, and disruption of supply lines with increased costs of imports may converge to promote a reconciliation in favor of US producers. In that event, the American penchant for voluntary cooperation will prove itself once again.

Funding

None.

Ethical approval

This study does not contain any studies with human or animal subjects performed by the author.

Author contributions

Jean Giblette wrote and revised the manuscript.

Conflicts of interest

The author declares no financial or other conflicts of interest.

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Edited by Jiayu Gong

How to cite this article: Giblette J. Production of Chinese Medicinal Herbs in North America: Challenge and Reconciliation. Chin Med Cult 2022;5:234–240.

Review

CHINESE 中医药文化(英文)
MEDICINE AND CULTURE

OPEN

Traditional Chinese Medicine and COVID-19: Experiences, Lessons, and Suggestions

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Abstract

Coronavirus disease-2019 (COVID-19) has now entered its third year as a worldwide pandemic. Unlike the Unites States, over 90% of patients have used traditional Chinese medicine (TCM) in China combined with conventional western medicine. The present minireview/commentary summarizes the experiences of TCM in the treatment of COVID-19 combined with conventional western medicine, lessons from the United States and some additional insights. COVID-19 falls into the category of "dampness–toxin plague" and is divided into five stages: mild stage, moderate stage, severe stage, critical stage, and recovery stage. Clinical trials conducted in China have suggested that TCM treatment plays a significant role in alleviating clinical symptoms, decreasing the time of hospitalization, reducing the overall fatality rate, and providing other beneficial outcomes when combined with conventional western medicine. To date, TCM is not widely used in the American hospital system. Only one TCM clinical trial to treat mild to moderate COVID-19 has been registered with ClinicalTrials.gov. A suggestion of dialogues among associated parties is proposed. TCM has been used as part of an integrative medicine treatment paradigm combined with conventional western medicine for COVID-19 in China. As registered clinical trials combining conventional western medicine with TCM continue to be produced and show positive benefits, the possibilities for TCM integration into treatment protocols for COVID-19 will become more of a possibility in the United States.

Keywords: Acupuncture; COVID-19; Dialogue; Miscommunication; Traditional Chinese medicine

1 Introduction

In December 2019, the first case of coronavirus disease-2019 (COVID-19) was reported in Wuhan, China.[1] Since then, COVID-19 has become a global pandemic. The lung is the main target organ, but reports also show the damage involving the heart,[2] skin,[3] blood vessels and blood cells,[4] liver,[5] neurons,[6] and kidney.[7] Thromboembolic events are also a complication, especially in critical cases.[8] So far, the consensus from the field of traditional Chinese medicine (TCM) practitioners about this disease is: it is a plague; and the etiological factors include cold and dampness. If the pathological factors cannot be resolved at the early stages, they may result in blockage of *Qi*, collapse of *Yin* and *Yang* and eventually death. Its brief mechanism is generally recognized as: the cold and dampness invade through the nose and/or mouth, and accumulate in the lung. When the cold and dampness are transformed into heat, normal functions of the lung and heart will be damaged significantly, thus the disease would progress into the severe stage. If the heat persists, it may ultimately lead to damage of almost all organs. In China, TCM has contributed significantly to the treatment of COVID-19, integrated with modern imaging systems, hospital facilities, pharmaceutical drugs, and other conventional western medicine treatments. Over 90% of patients have been treated with TCM as an integrative therapy in China,[9] and multiple reports indicated a beneficial outcome of adding TCM.[10] However, TCM is not widely used in the hospital system of America. This present minireview/commentary summarizes the experiences of TCM field in the management of COVID-19 combined with conventional western medicine, lessons from the United States, and proposes suggestions to change the current situation.

2 TCM etiology, pathology, and treatment principle

According to the characteristics of COVID-19, it is diagnosed as a "dampness–toxin pestilence,"[11] and divided into five stages: mild, moderate, severe, critical, and recovery. For mild cases, the TCM pattern is cold–dampness invading the lung or damp–heat retaining in the lung. The treatment principles are to remove cold and dry dampness, or to clear heat and resolve dampness. For moderate cases, the pattern is toxic-dampness invading the lung or cold-dampness

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Chinese Medicine and Culture (2022) 5:4

Received: 24 August 2022; accepted: 6 November 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000036

blocking the lung. The treatment principles are to dry dampness and remove toxins, or to dry dampness and remove cold. For severe cases, the pattern is pestilence toxin blocking the lung or heat in both *Qi* and blood. The treatment principles are to eliminate dampness and remove toxin or to clear heat in both *Qi* and blood. As for the critical cases, the pattern is internal blockage and external collapse. The treatment principles are to open blockage and revitalize *Yang*.[12,13] Dampness, instead of cold or wind invasion, is the main pathogenic factor.[14] Patients of the mild, moderate, severe or critical stages can be recovered completely or left with some complications. In the recovery stage, the TCM pattern is *Qi* deficiency of the lung and spleen, or deficiency of *Qi* and *Yin*. The treatment principles are to, tonify *Qi* of the lung and spleen, or tonify *Qi* and *Yin*.[15]

The disease starts at the lung and eventually affects multiple organs if the plague is not controlled. Figure 1 demonstrates the interactions of the lung and other organs according to TCM theory. Organs in the figure are a combination of conventional western medicine anatomy and concepts from TCM theory.

3 Clinical reports of TCM and COVID-19

Reported clinical studies have suggested that TCM treatment plays a significant role in alleviating clinical symptoms, decreasing the time of hospitalization, reducing the overall fatality rate, and providing other beneficial outcomes when combined with conventional western medicine.[16] One systemic review and meta-analysis searched six electronic databases (PubMed/MEDLINE, Cochrane Library, ScienceDirect, Google Scholar, Wanfang Data, and China National Knowledge Infrastructure), collected randomized controlled trials (RCTs) from peer-reviewed journals and non-reviewed publications, and adopted strict standards to satisfy the quality of analysis. They finally included seven original studies, comprising a total of 732 adults, for a meta-analysis. They found that comparing to the standard care, integrating TCM can improve the symptom and sign score, inflammation marker and manifestation of lung CT scan.[17] Here we selected some representative clinical reports, whose dosage form includes patent TCM and TCM formula, disease severity ranges from mild and moderate cases to severe/critical cases, to show the safety and efficacy of TCM combined with conventional western medicine.

TCM has been reported to improve the overall cure rate. In a multicenter, prospective, RCT, Lian Hua Qing Wen Capsules (连花清瘟胶囊), a patent Chinese medicine, significantly improved the recovery rate of patients with COVID-19 (91.5% *vs.* 82.4%) compared to the conventional western medicine alone. Similar positive results were also observed with chest computed tomography results (83.8% *vs.* 64.1%) and the clinical cure

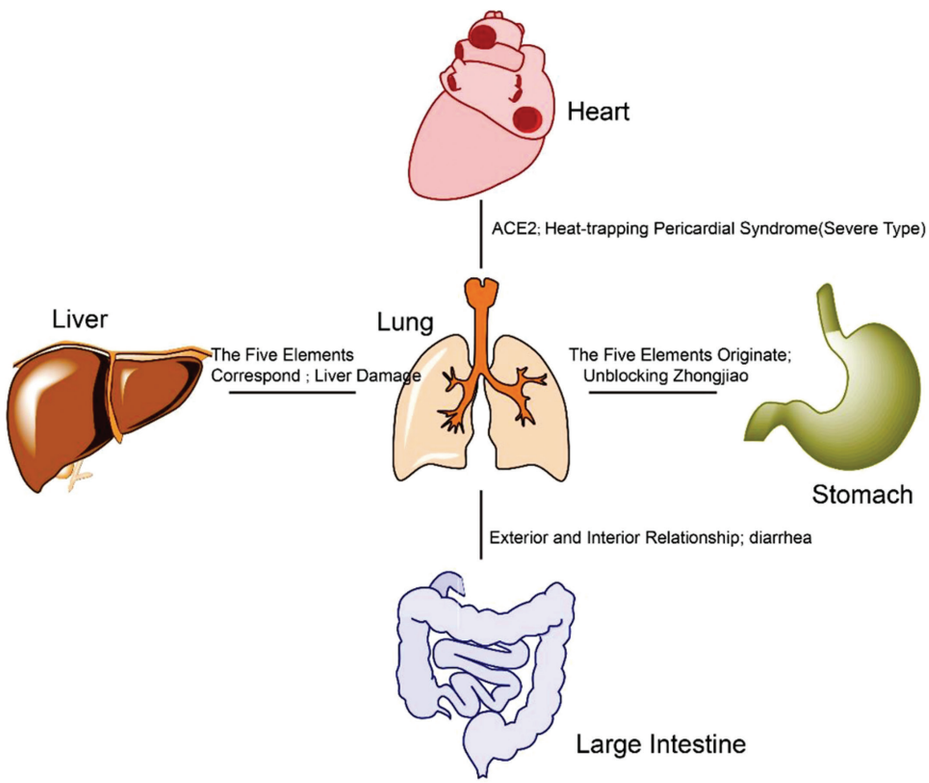

Figure 1 Connections between lung and other organs according to TCM theory, cited from Zhao et al[14]

rate (78.9% *vs.* 66.2%).[18] Furthermore, TCM also alleviated symptoms such as fever, cough, fatigue, and loss of appetite more rapidly.[19]

Tian et al. enrolled 721 mild and moderate COVID-19 patients, including 430 Han Shi Yi Formula (寒湿疫方) users (HSYF group) and 291 non-users (control group). They observed that no cases in the exposed group but 19 (6.5%, $P < 0.001$) cases in the control group advanced to severe disease. After propensity score matching (PSM), none of the Han Shi Yi Formula users but 7 (4.7%, $P = 0.022$) non-users progressed to the severe stage. They concluded that Han Shi Yi Formula can significantly reduce the advancement to the severe stage in cases of mild and moderate COVID-19.[20] The same team also used the method of propensity score matching in a 1:1 ratio and enrolled 156 Chinese herbal medicine (CHM) users and 156 non-users. All-cause mortality was observed in 13 CHM users and 36 non-users, indicating the fatality risk of CHM users was reduced by 82.2% compared to non-users.[21]

A multicenter, RCT conducted at four medical centers took a total of 111 severe/critical patients and randomly assigned them to receive Shen Huang Granule (参黄颗粒剂) as the SHG group twice a day for 14 days with standard care, or to receive standard care alone as the control group. The reports showed that the overall fatality was decreased from 75.9% (41/54) in the control group, to 38.6% (22/57) in the SHG group. Interestingly, the ventilation rate in the SHG group was 0, but in the control group was 58.8% (10/17).[22] This report is important since it is the first report focusing on severe/critical cases at the very beginning of the pandemic with dramatically reduced fatality and rates of mechanical ventilation.

The TCMs of Jin Hua Qing Gan Granule (金花清感颗粒), Lian Hua Qing Wen Capsule/Granule, Xue Bi Jing Injection (血必净注射液), Qing Fei Pai Du Decoction (清肺排毒汤), Hua Shi Bai Du Formula (化湿败毒方), Xuan Fei Bai Du Formula (宣肺败毒方), were renowned and broadly reported for their good efficacies and safety, and were named "three medicines and three formulas" collectively. To save space, we summarize their representative clinical reports, and other TCM mentioned in the above paragraphs in Table 1.

No severe adverse events have been reported in the clinical trials of TCM in their treatment of COVID-19 so far when combined with conventional western medicine.[17]

4 Acupuncture in COVID-19 management

Acupuncture is the main modality of TCM in countries outside of China. In the treatment of COVID-19, it was used as adjunctive therapy to CHM. No clinical trials of acupuncture in the management of COVID-19 have been reported so far. Instead, they were mainly reported as case studies. For example, Yin et al. treated a patient with severe COVID-19, significant shortness of breath and decreased peripheral oxygen saturation (SpO_2), with manual acupuncture combined with the CHM granule formula Fu Zheng Rescue Lung (扶正救肺方) and Xue Bi Jing Injection along with conventional western medicine. After acupuncture was administered, it quickly improved the patient's breathing function, SpO_2 and the heart rate recovered.[27]

Additionally, a 37-year-old female physician in the United States also reported a case of using acupuncture for COVID-19. This case described a New York City anesthesiologist and medical acupuncturist who was infected and confirmed to have the COVID-19 virus. She had severe symptoms of pneumonia, such as pleuritic chest pain, shortness of breath, increased respiratory

Table 1 Summaries of clinical reports of treating COVID-19 with TCM

No	Name of TCM	Type of study	Intervention	Control	Severity	Main outcomes	Reference
1	Lian Hua Qing Wen capsule	Prospective multicenter open-label randomized controlled trial	Lian Hua Qing Wen Capsule + SC	SC	Mild to moderate	Recovery rate and time	18
2	Xuan Fei Bai Du Decoction	Randomized clinical trial	Xuan Fei Bai Du Decoction + SC	SC	Mild to severe	Disappearance rates of major symptoms	19
3	Han Shi Yi Formula	Retrospective cohort study	Han Shi Yi Formula + SC	SC	Mild to moderate	The proportion to severe status	20
4	Ma Huang Liu Jun Tang	Retrospective cohort study	Ma Huang Liu Jun Tang + SC	SC	Severe to critical	All-cause mortality	21
5	Shen Huang Granule	Randomized controlled multicenter trial	Shen Huang Granule + SC	SC	Severe to critical	Overall improvement rate and mortality	22
6	Jin Hua Qing Gan granule	Randomized controlled trial	Jin Hua Qing Gan Granule + SC	SC	Suspected and confirmed cases, mild	Clinical symptoms, disease aggravation rates	23
7	Xue Bi Jing Injection	Randomized controlled trial	Xue Bi Jing Injection + SC	SC	Severe	Recovery rate and inflammation marker	24
8	Qing Fei Pai Du Decoction	Single-center, retrospective, observational study	Qing Fei Pai Du Decoction + SC	SC	Moderate to critical	Death	25
9	Hua Shi Bai Du Formula	Unblinded, cluster-randomized clinical trial	Hua Shi Bai Du Formula + SC	SC	Mild	Recovery or aggravation rate	26

COVID-19: coronavirus disease-2019; SC: Standard Western medicine care; TCM: traditional Chinese medicine.

rate, hypoxia, dry cough, orthostatic hypotension, and headache. She self-treated with cupping therapy at the onset of anosmia, using dry suction vacuum cup therapy (plastic, 1.5 in diameter) in the area of LU 1 bilaterally, and administered acupuncture upon onset of pulmonary symptoms using acupuncture points like Yunmen (云门 LU 2), Kongzui (孔最 LU 6), Zusanli (足三里 ST 36), Quchi (曲池 LI 11), Dazhui (大椎 GV 14), Dingchuan (定喘 EX-B1), and Chuanxi (喘息 EX-B10). All pulmonary symptoms recovered after 2 days, and eventually she made a full recovery.[28]

5 Lessons in America

From the above data, we can conclude that adding TCM to conventional western medicine treatments for COVID-19 patients may be promising with respect to improved treatment outcomes. Unfortunately, TCM is not widely used in the American hospital system, if any. Obviously, using the latest version of the *Standards for Reporting Interventions in Clinical Trials of Acupuncture* (STRICTA) guidelines for all clinical trials involving TCM combined with conventional western medicine must be enforced to increase reproducibility and transparency of all findings.[29] In the United States, as of May 23, 2022, there were 83,281,329 confirmed cases of COVID-19, with 1,002,173 cumulative deaths.[30] The approval of medication Paxlovir did not change the clinical outcome markedly.[31] If the mortality can be reduced by 82.2% as the reported result by integrating TCM into the management,[21] at least 600,000 lives can be saved. Public health measures in the United States, including federal provision and coverage for two rounds of COVID-19 vaccination and later two rounds of booster shots have greatly reduced the number of hospitalizations in the United States. As of May 23, it is estimated that 69% of the US population has been fully vaccinated against COVID-19, while hospitalizations have decreased to only 4,116 ICU hospital beds needed.[32] Although vaccination in the United States has greatly reduced hospitalizations and deaths from COVID-19, how to manage complications of COVID-19 is still a challenge.[33] The effects of what is now formally referred to as long-lasting COVID-19 disease or long COVID is estimated to affect millions of individuals who have previously contracted COVID-19, with symptoms including fatigue, headache, dyspnea, and anosmia.[34] Although there are no published randomized clinical trials using TCM for long COVID, TCM may have its greatest value in resolving symptoms and improving the quality of life, where it might be used as a stand-alone treatment. If TCM were more integrated into the healthcare system of the United States and demonstrated similar safety and efficacy as the results observed in China, then severe/critical cases and associated mortality we hypothesize would be significantly reduced. At the current time, there is only one registered clinical trial in ClinicalTrials.gov of TCM to treat mild to moderate COVID-19 in the United States. However, "The purpose of this study is (only) to document the safety of taking TCM in patients with COVID-19 and to gain information to determine whether a study with TCM can be conducted. The study will test a TCM that has been made into a granule formulation called Xuan Fei Bai Du Granulesv (宣肺败毒颗粒)" (ClinicalTrials.gov Identifier: NCT04810689). As more rigorous clinical trials of TCM continue to be registered, conducted, and published in China, we expect to see more trials of TCM formulations conducted in the United States.

As stated above, another major health concern of contracting COVID-19 even in fully vaccinated and boosted individuals is long COVID. It occurs in a range from 7.5% to 41% in non-hospitalized adults, 2.3%–53% in mixed adult, 37.6% in hospitalized adults, and 2%–3.5% in mainly non-hospitalized children.[35] Pilot study indicates that female sex, age, comorbidities, severity of acute disease, and obesity are related to long COVID. Nearly 50% of primary studies discovered some degree of long COVID-related social and family-life damage, long periods away from work, reduced workloads, and unemployment.[36,37] This indicates that long COVID will likely have a profound public health impact, and although few reports of TCM that include acupuncture for long COVID are currently available, the evidence is emerging.[38] And indeed, effectiveness is increasingly anecdotally observed in the practice of acupuncturists (personal experience and personal communication). More definitive evidence must await larger clinical trials in China and the United States, and these will certainly be forthcoming given that millions of individuals are currently suffering or will suffer from long COVID.

6 Suggestion of dialogues among associated parties

We think that TCM selectively neglected in the American hospital system is mainly due to miscommunication.

To resolve this miscommunication, a dialogue is necessary, and the World Health Organization (WHO) has set a good example. The attitude of WHO about recommending TCM for COVID-19 has always been ambiguous, but this situation has changed recently. Following a high-level policy dialogue between the Director-General of WHO and China's National Administration of TCM (NATCM) in Geneva on January 17, 2022, WHO had a meeting of experts to evaluate the role of TCM in the treatment of COVID-19, from February 28 to March 2, 2022.[39] The key findings of the Expert Meeting include but are not limited to: ①. The evidence evaluation reports applied appropriate and rigorous methodology to determine the current level of clinical evidence and safety of the studied TCM interventions used in the trials. ②. On the basis of clinically relevant outcome measures, the

studied TCMs are helpful in the treatment of COVID-19, particularly in mild-to-moderate cases. ③. There are promising data to suggest that TCM is helpful in reducing the risk of progression from mild-to-moderate stages to severe COVID-19 stages. ④. Though with some limitations, the data from the selected RCTs justify further investigations in clinical trials to assess the potential benefits of selected TCMs in the treatment of COVID-19.

A similar dialogue or public hearing can happen in America. A dialogue between associated parties such as the American Society of Acupuncturists (ASA), National Institutes of Health (NIH), and Food and Drug Administration (FDA) may help to resolve the miscommunication. Indeed, a similar and successful conference was held in 1997: the NIH Consensus Development Conference on Acupuncture. The consensus of that conference stated that: "Promising results have emerged, for example, efficacy of acupuncture in adult post-operative and chemotherapy nausea and vomiting and in postoperative dental pain." "There is sufficient evidence of acupuncture's value to expand its use into conventional medicine and to encourage further studies of its physiology and clinical value."[40] Before this conference, in 1996, the FDA reclassified acupuncture needles for the administration of acupuncture and substantially equivalent devices of this generic type from class III (premarket approval) into class II (special controls).[41] This upgrade means acupuncture needles are medical devices for "general use" by trained professionals, not "experimental" device anymore. These two milestone events laid a solid foundation for American people to enjoy the medical benefits of acupuncture. We hope this good tradition of communication among NIH, FDA, and American acupuncture field can continue.

Currently, the FDA has a major separation between "conventional foods" and drug products and what it refers to as "dietary supplements." As stated by the FDA on their website, "FDA regulates both finished dietary supplement products and dietary ingredients. FDA regulates dietary supplements under a different set of regulations than those covering 'conventional' foods and drug products, specifically under the Dietary Supplement Health and Education Act of 1994 (DSHEA)."[42] TCM currently belong to the category of dietary supplements and dietary supplement ingredients, although there have been a few cases where a TCM formulation has gone through the FDA's rigorous evaluation process of preclinical and clinical testing towards achieving approval as a drug. The successful completion of the phase II clinical trials for the TCM formulation, Compound Dan Shen Dripping Pill (丹参滴丸), approved since 1993 by the Chinese FDA (CFDA), is an example of this. Since the mechanisms and development process of CHM is substantially different from that of drug pharmacy, apparently, they do not fall into the category of drugs in the conventional western medicine paradigm, even though CHM is used in China to treat a wide variety of medical conditions. Due to the fundamental differences in diagnosis and treatment paradigms of TCM and conventional western medicine, FDA approval of any CHM formulations prescribed to diagnose, treat, cure, or prevent any disease condition must be put through the same rigorous preclinical and clinical testing done for all drug approvals in the United States. However, this does not prevent licensed TCM professionals from accredited institutions in the United States from practicing the full scope of their training in TCM in private practice, thanks to state licensure legislation (state board of medical practice or acupuncture) and exam organizations such as the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM), or California Acupuncture Board (administrating California Acupuncture Licensing Examination [CALE]).

For the moment, though, we must accept the fact that in the United States, TCM formulations are classified as "dietary supplements" by the FDA and are treated like all botanical medicines and natural products, and thus are currently regulated under the DSHEA of 1994. Under this paradigm, it is not necessary for traditional CHM manufacturers to get pre-market approval from the FDA, but they are responsible for determining that their products are made according to internationally recognized Good Manufacturing Practices (GMP), that they are safe and that their product claims are supported by some clinical evidence.

As a matter of fact, the attitude of conventional medicine system is becoming more and more friendly toward TCM. For instance, in 2019, WHO member states endorsed the eleventh revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-11). Importantly, ICD-11 now includes TCM for the first time.[43] By adding a supplemental chapter 26 to the ICD-11, which now includes 150 disorders and 196 patterns that derive from the TCM paradigm; and by acknowledging that these 150 disorders and 196 patterns arise from classic concepts that are completely outside of the conventional western medicine paradigm, this bodes well for future integration of TCM into mainstream conventional western healthcare systems. One can imagine in the future United States community clinics and hospital pharmacies carrying conventional western medicine drugs but also TCM formulations, as is done in China today.[44] As with any highly regulated profession, pharmacists will be key stakeholders in evaluating and communicating to the public the sourcing, quality, safety, tolerability, and efficacy of any TCM formulation, just as they are required to do with conventional western medicine drugs.

In the United States, as far as we know, the pharmaceutical companies or distributors only authorize licensed acupuncturists/Chinese medicine practitioner

to order TCM concentrated granules. Given the large amount of preclinical and now clinical trials data registered and published in China, including now clinical trials on concentrated granules used to treat COVID-19 (China Clinical Trial Registry), perhaps there will be a way in the future to provide an FDA fast-track for some of the concentrated granules used in these trials with positive clinical results, and that they might be categorized as drugs to diagnose, treat, cure, and prevent disease, without having to go through the additional millions of dollars of FDA-overseen preclinical and clinical phase I, II, and III clinical trials, requiring massive duplication of time, money, and effort. Better collaboration, cooperation, alignment, and understanding between FDA-like regulatory agencies in places like China, Japan, South Korea, the United States will certainly help people to achieve better health and have more choices to combat future pandemics like COVID-19, but with substantially less mortality.

7 Conclusion

In conclusion, TCM has contributed significantly to the management of COVID-19 in this pandemic. Unfortunately, it is not widely used in the American hospital system for this battle. We think this situation is most likely caused by miscommunication. To resolve this miscommunication, we suggest a dialogue among associated parties. The good dialogue tradition among NIH, FDA and American acupuncturist field, recent improved attitude of WHO toward the role of TCM in the treatment of COVID-19, and newly addition of TCM disorders and patterns to ICD-11, all encourage a promising dialogue in America, and eventually, save more lives.

Funding

None.

Ethical approval

This article does not contain any studies with human or animal subjects performed by any of the authors.

Author contributions

Zuo-Biao Yuan drafted the manuscript. Paul S. Amieux revised the manuscript. Both authors contributed to the conception and design of the article and interpreting the relevant literature, read and agreed to the published version of the manuscript.

Conflicts of interest

The authors declare no financial or other conflicts of interest.

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Edited by Jiayu Gong

How to cite this article: Yuan ZB, Amieux PS. Traditional Chinese medicine and COVID-19: experiences, lessons, and suggestions. Chin Med Cult 2022;5:241–247. doi: 10.1097/MC9.0000000000000036.

News and Views

CHINESE 中医药文化(英文)
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OPEN

Acupuncture Legislation in Virginia, United States: A Personal Experience and Beyond

Arthur Yin Fan[1,2,✉]

Abstract

Virginia was once considered as one of three states in the United States that was particularly resistant to acupuncture and its legislation, due to the historically strong conservative force in Virginia. In this article, the author aims to review and discuss the history and the current situation of acupuncture legislation in Virginia, and provides some insights for the related legislations in other states and at federal level. This study was based on author's personal experience and an interview with Mr. Floyd Herdrich, former president of the Acupuncture Society of Virginia, who made the biggest contribution to this legislation. Led by the Acupuncture Society of Virginia, and supported by the School Tai Sophia Institute, Virginia acupuncture legislation began in 1988 and the law was implemented in 1994. Virginia is the 27th state in the United States to legalize acupuncture practice, and it has been 28 years since then. The author's insights are: the first important factor is dedications as the persistent efforts in legislation usually take many years to materialize. The second factor is the strategy, that is, legislation through the executive or administrative system is probably a much easier route or shortcut.

Keywords: Acupuncture; Legislation; Traditional Chinese medicine; Virginia

1 Introduction

A dozen academic papers on the legislation history of acupuncture or traditional Chinese medicine (TCM) in the United States (U.S.) have been published, including the Nevada, California, New York, Massachusetts, Washington D.C. as well as surrounding states of Maryland,[1–14] and Virginia.[3] Virginia was once considered a state that was particularly resistant to acupuncture and its legislation, due to the historically strong conservative force in that state.[3] Except for the practicing of acupuncture by Western-trained medical doctors, Virginia had been considered as one of three most unlikely states in the country to legalize the acupuncture practice by acupuncturists.[3,15] However, some wanted to change that perception. Dr. Ralph Coan, a medical doctor from Maryland and a life-long supporter of acupuncture, was one of two founders of the American Association of Acupuncture and Oriental Medicine, which became the most important national association for TCM in the U.S.. He has served as president, vice president, and board member for a very long time. He testified in front of the Virginia State Assembly several times for the legislation of acupuncture.[3] There were several others who were inspired by him, and made continuous efforts of their own.

Acupuncture legislation in Virginia was influenced by legislation of other states in the U.S. and other countries. No doubt that Chinese mainland was the first region in the world where the government had issued policies to support TCM, including acupuncture. China has treated TCM practitioners as physicians since the founding of the People's Republic of China; but formal legislation for TCM was not passed until 2016.[16] The first piece of legislation for acupuncture and TCM in the world was passed in Nevada, U.S., in 1973.[17] Dr. Yee Kung Lok, the "Father of acupuncture in the United States," was the first government-recognized doctor of Chinese medicine and acupuncture in Nevada state. His license number was no.1 and acupuncturists in the U.S. commemorate him because of his major contribution in that legislation. Mr. Arthur Steinberg and Mr. Jim Joyce also took the lead in passing acupuncture legislation in Nevada.[9] Without their efforts, the development of TCM or acupuncture in the U.S. would be very different to start. On December 28, 1972, the Washington Acupuncture Center, the first government approved acupuncture clinic in the American history, opened its door.[1–3,18] Fast forward today, there are a total of 48 independent jurisdictions, namely 47 out of 50 states in the U.S. plus Washington, D.C., that have laws regulating the practice of acupuncture or oriental medicine.[19,20] This paper aims to review and discuss the history and the current

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Chinese Medicine and Culture (2022) 5:4

Received: 5 July 2022; accepted: 29 October 2022

First online publication: 30 December 2022

http://dx.doi.org/10.1097/MC9.0000000000000031

situation of acupuncture legislation in Virginia, and provides some insights for the legislations in other states and at federal level.

2 Current basic situation in Virginia acupuncture legislation and personal experience as vice president of American TCM Association

At the beginning of 2018, there were approximately 38,000 active licensed acupuncturists in the U.S.; among them, Virginia had 502 (as of the end of August 2022, the number has become 584[21]), ranking 19th nationally.[19,20] In recent years, I have been participating in legislative activities related to TCM or acupuncture. In Virginia, the administration of acupuncture or TCM has been handled by the Acupuncture Advisory Committee (AAC) under the Board of Medicine, instead of an independent acupuncture board like those in Nevada or California. The reason is cost-efficiency, as all AAC members work as volunteers and without salary. If an acupuncture board is established, the acupuncturists would be responsible for the salary of a specialized officer, which would cost an extra $30,000 to $50,000 per year; this means that the state licensing fee would increase significantly. In 2012, I made a proposal to the AAC, requesting that the Regulations Governing the Practice of Licensed Acupuncturists (hereafter referred as the Acupuncture Regulations) should clearly state that acupuncturists can legally use traditional Chinese herbal medicine(s), and that acupuncturists applying for a license should not only pass the national examination in acupuncture, but also pass the Chinese herbology and biomedical exams, since patients are increasingly using Chinese and Western herbal medicines. I also proposed that licensed acupuncturists with a background in TCM should be able to prescribe biochemical tests to monitor potential side effects or adverse effects during the period using the herbal medicine in patients. In a board meeting, the five members of the AAC expressed their oppositions after a collegial discussion. Their first consensus was that the Acupuncture Regulation (of Virginia) has clearly stated that acupuncturists can use "dietary supplements." Chinese herbal medicine(s) should also be considered as food or dietary supplements; therefore, there is no need to add a term for "TCM" specifically. Second, regarding the proposal that "acupuncturists are required to pass the Chinese herbal medicine and biomedical examinations to apply for a license," they felt that some acupuncturists would oppose to it because such professionals may only be interested in practicing acupuncture only. Third, adding the right to prescribe biochemical test is beyond the original scope of Acupuncture Regulations and it therefore could not be decided by the AAC. Instead, it should be decided by the Board of Medicine. AAC predicted that this proposal would be opposed by (western) medical doctors.

Another issue was the objection to physical therapists practicing acupuncture in the name of "dry needling" with a training of 11 to 54 hours through continued education since 2014. The author attended at least five board meetings of the Virginia Board of Physical Therapy along with other acupuncturists from Virginia and other states. We spoke at each meeting to express our explicit opposition and reasons for our opposition. As a Vice President of the American TCM Association (ATCMA) in academic and legislation affairs for the past 8 years, I worked closely with my ATCMA and other associations' colleagues (Dr. Michelle Lau, Dr. Sarah Alemi, Dr. David Miller, Dr. Haihe Tian, Dr. Hui Wei, Dr. Hui Ouyang, Dr. Deguang He, Dr. Bolin Qin, and Dr. Jun Xu, etc.), launched two rounds of online public comments on the website of the Virginia Board of Physical Therapy, and encouraged 1,176 licensed acupuncturists, medical doctors, and patients to give comments on "dry needling" issue, to express our further opposition and the concerns.[22] The major concern is that the so-called "dry needling" may pose a safety issue to the general public. The ATCMA and other concerned associations hoped that physical therapists could match the medical doctor's acupuncture education requirement of 300 hours. However, as of now, this issue has been more than 6 years since the legislation passed, but it is still unresolved and ATCMA's goal has not been achieved. The battle is still ongoing. The crucial issue is that the majority of acupuncturists are tired and have lost interest in protecting own professional privilege; it is worrisome.

3 History of Virginia acupuncture legislation

While attending some of the above-mentioned meetings, I got to know Mr. Floyd Herdrich, a pioneer in the Virginia acupuncture profession, and met him in person three times. I learned that he was the president of the Acupuncture Society of Virginia (ASVA) when acupuncture legislation was first passed in Virginia. I also received a hardcopy of an old newsletter from him. Virginia acupuncture legislation began in 1988 and was passed in 1994. Virginia is the 27th state in the U.S. to have acupuncture practicing laws,[23] and it has been 28 years since then.

I would like to thank Dr. Ralph Coan, who made special contributions to the legislation of acupuncture in the U.S. as well as Mr. Bob Duggan. Both are fighters and famous figures in the field of acupuncture. Unfortunately, they passed away a few years ago. I mention them specifically, and want to use this article as a kind of special memorial to them. Duggan was a Catholic priest in his early years. He quit the religious work and married a woman named Diane. Then he and Diane went to the United Kingdom to study Five Element Acupuncture with Professor J.R. Worsley. Bob later became a representative of Five Element Acupuncture,

the Dean of the Tai Sophia Institute in Maryland that he and Diane established. He was also a major promoter and advocate of three major organizations in acupuncture and Chinese medicine or Oriental medicine, that is, the Council of Colleges of Acupuncture and Oriental Medicine (CCAOM, now CCAHM, Council of Colleges of Acupuncture and Herbal Medicine), Accreditation Commission for Colleges of Oriental Medicine (Note 1), and the National Certification Commission for Acupuncture and Oriental Medicine. He probably was the first person in the West to clearly and openly express dissent to "TCM" style acupuncture which was formed in 1950s by some acupuncture scholars converted from Chinese herbalists. This kind of acupuncture uses pattern identification (a clinical thinking mainly used by TCM internal medicine practitioners) to direct acupuncture practice. He personally named this kind of acupuncture as "herb" style acupuncture. He believes acupuncture should be based on the *Huangdi Neijing* (《黄帝内经》 *The Yellow Emperor's Inner Classic*), and return to meridian theory to direct its practice. I strongly agree with him, and I have discussed this point of view in various situations and especially with some leaders of China Association for Acupuncture and Moxibustion. I am glad to know that currently more and more acupuncture professionals agree with this viewpoint.

Tai Sophia Institute (Note 2) was the first TCM college in the U.S. that was accredited by the Accreditation Commission for Colleges of Oriental Medicine to grant a master's degree in acupuncture in 1985. Dugan was a very creative educator. His assignment for the masters' students as part of their graduation requirement was to "complete a project that would have an impact on the world." For this goal, some students choose to go to their own states or nearby states to promote acupuncture legislation.[15]

Claire Wistoff, a former TAI student who lived in Virginia at that time, planned to open an acupuncture center in Virginia after she completed her acupuncture studies. She wanted to help promote acupuncture legislation in Virginia. Considering the difficulty of passing acupuncture legislation in Virginia, she called together two other junior TAI students from Virginia, Mr. Floyd Herdrich and Ms. Ann Strozier Adams. While learning about the legislative process and the process for passing acupuncture legislation, they met a woman who told them that she had the privilege of having a meeting with Richard Morrison, the Virginia Health Secretary (the head of Virginia Health Department) at that time. Because she was a fan of acupuncture, she asked the Health Secretary, "How can I legally receive acupuncture in Virginia?" To which, Mr. Morrison said, "Ah, ah, now there is an opportunity, someone submitted a bill to make alternative medicine (acupuncture) legal" and encouraged her to do some lobbying work. They were treating this woman to breakfast at the time, so it was at this breakfast meeting that the three students formed ASVA and went to the state to lobby. This kind of society is used to be branded as "academic," but it is inaccurate. In fact, it should be called "professional association" because such state associations serve the interests of the entire acupuncture industry. They do sometimes carry out academic activities; however, the purpose of such academic activities is mainly as a means to subtly raise fund for the organization. ASVA's first board consisted of three people: Claire Wistoff as President, Ann Adams as Vice President, and Floyd Herdrich as Treasurer.

Since then, the three students drove every week to the state capital Richmond. It took 7 hours to drive back and forth; sometimes they went together, sometimes only one person. They visited and lobbied state legislators, including state representative Marianne Van Landingham. Marianne enthusiastically suggested that they should mobilize Virginia residents to write supporting letters, so that the legislators could hear the voices from the residents of their constituents. This was not an easy task. However, they were fortunate as several reports on the efficacy of acupuncture appeared in newspapers and on televisions at that time. The enthusiasm of the public for acupuncture was mobilized, so these students collected a lot of supporting letters from the public. Later, during the acupuncture legislation process, some residents even went with the three students to meet their representatives. Floyd made a bigger contribution to Virginia's acupuncture legislation, persuading Senator Clive Duvall to submit an acupuncture bill to the state legislature. This bill was very brief, as it did not explicitly propose detailed content of acupuncture legislation, but just let the state medical administration install acupuncture ("…by the Board of Medicine to look at acupuncture in the state"). This was a good strategy, as it avoided a debate by members of Congress and left the executive branch to think about how to install and operate.

In the following years, although they had graduated, the three students still received full support and help from TAI's administration, including legislative strategy seminars and financial supports. TAI's alumni also initiated multiple donations to support them. They still went to the state health administrative department every week to "grin." Sometimes people in these administrative departments were not enthusiastic about them, and they would just smile. I once asked Floyd, "You didn't have an acupuncture license at the time, how could you practice acupuncture or solve your survival issue?" He told me that he had a clinic in Maryland and a clinic in Virginia; he was practicing legally in Maryland but illegally in Virginia. I asked him, "You're not afraid of being caught and jailed by the Virginia State Police?" He smiled and told me that Virginia is a state in which "small government" has been advocated for. Unlike other states, there were not many police officers, and they would not spend a lot of money to arrest people for "small mistakes like illegal

medical practice" as long as the health administrative department turns a blind eye. As the Health Secretary and the Board of Medicine had been discussing with the three students on how to install acupuncture into the Virginia's health system, the administration did not care about Floyd and others practicing acupuncture without a license in the "northern border area" (northern Virginia). During this period, Floyd spent the most time and efforts on legislation, and finally, in 1994, Virginia's Acupuncture Regulations was approved and signed into the law by Governor Douglas Wilder (Fig. 1), who is an African-American and a member of the Democratic Party. The law required acupuncturists to practice under the "supervision of a physician." This requirement was removed in 1996,[24] after lobbying by ASVA members, and replaced by a requirement that the patient must sign a document stating that they should go to a physician (a licensed practitioner of medicine, osteopathy, chiropractic, or podiatry) or get a prescription of a physician with a definitive diagnosis in order for the acupuncturist to treat them.

Of course, the requirements in Virginia's acupuncture practicing law were stricter than those in other states. For example, when I applied for an acupuncture license in Virginia in 2001, I encountered difficulty. At that time, Virginia required acupuncture license applicants to obtain a degree from a domestic American school; if the applicant had a foreign degree, they must acquire an acupuncture license in another U.S. state in advance and had practiced acupuncture for more than 5 years. I was educated in China in a college of Chinese medicine for 5 years and had practiced in China for 16 years, and I strongly questioned this unreasonable requirement. In the following year, the regulation was changed; therefore, I could also be considered to have made a little "contribution" to the legislation of acupuncture in Virginia, and I am probably the first licensed acupuncturist in Virginia who has an education background in Chinese mainland and successfully applied for a license directly.

4 Some insights

My insight is that both "academic societies" and "professional associations" in the U.S. should be the organizations that serve the interests of their industry. TCM organizations should actively support the legislation and promote the development of Chinese medicine profession. On the other hand, TCM practitioners should dedicate more of their time to the advancement of their professions. Thinking of the reasons that Floyd and others were able to successfully legalize acupuncture in this "difficult" state, the first important factor is their dedications as they made efforts persistently for so many years. The second is the strategy. If they adopted the ordinary legislation process through the House like acupuncture legislation in some other states,[3,9–11] it would be more difficult to be successful. They adopted legislation through the executive or administrative system. Looking at the acceptance of acupuncture by the Veteran Health Administration, and how TriCare medical insurance for civilian and military employees began to include auricular acupuncture in recent years, we will understand that legislation through the administrative system will cost much less and have a higher success rate than the formal legislative process through the legislative system. Now Medicare has started to cover acupuncture for chronic lower back pain for senior citizens in the U.S. since January 2021; however, acupuncturists are not eligible to treat Medicare patients because they are not listed as the Medicare providers. We should look for a resolution through the administrative system similar to that of the Virginia acupuncture legislation, although formal action of the legislation in the Congress has been conducted. As long as our acupuncture community and the public

Figure 1 Virginia Governor Douglas Wilder accepting Honorary Membership in the Acupuncture Society of Virginia. With the Governor are acupuncture student Ms. Sang Yi Lee, ASVA President Floyd Herdrich, and (back row) acupuncturists Koo Lee, Max Warren, Carlos Durana, Hong Do Na, and Luke Kapsak Kim (from left to right)

continue to keep their voices loud, it is estimated that in the next few years, this goal will eventually be reached. This is a personal prediction. Due to the limitation of the author's personal background and experiences, this article may have some omissions, limitations and errors; comments or corrections are welcomed and appreciated.

Notes

Note 1: Since inauguration, it was named as National Accreditation Commission for Schools & Colleges of Acupuncture and Oriental Medicine (NACSCAOM), now known as the Accreditation Commission for Acupuncture & Herbal Medicine (ACAHM).

Note 2: It was established in 1974 as "The College of Chinese Acupuncture," then renamed as "the Traditional Acupuncture Institute" in 1978, which was the origin of the term "TAI." Now it is called "Maryland University of Integrative Health."

Acknowledgments

The author expresses thanks to Mr. Floyd Herdrich for providing the ASVA Newsletter hardcopy (1994, including the photo), Dr. Sarah Faggert Alemi for the English editing, and all colleagues and friends who have made various contributions to the acupuncture legislation in Virginia (some were mentioned in current paper, some were not).

Funding

None.

Ethical approval

This study does not contain any studies with human or animal subjects performed by the author.

Author contributions

Arthur Yin Fan wrote and revised the manuscript.

Conflicts of interest

The author declares no financial or other conflicts of interest.

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Edited by Lin Su

How to cite this article: Fan AY. Acupuncture legislation in Virginia, United States: a personal experience and beyond. Chin Med Cult 2022;5:248–252. doi: 10.1097/MC9.0000000000000031

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Shanghai University of Traditional Chinese Medicine
The Shanghai Key Laboratory of Health Identification and Assessment

The Shanghai Key Laboratory of Health Identification and Assessment of Shanghai University of Traditional Chinese Medicine was approved by Shanghai Science and Technology Commission in October 2013. It passed the acceptance of Shanghai Science and Technology Commission in June 2016, and passed the first evaluation of Shanghai Science and Technology Commission in 2020. The current director of the laboratory is Professor Yiqin Wang, the deputy directors are Professor Zunji Ke and Professor Jiancheng He, and the director of the academic committee is Professor Ping Liu.

Centering on the "Healthy China" strategy and oriented to solve the major national needs and the frontier of traditional Chinese medicine (TCM) science and technology, the Shanghai Key Laboratory of Health Identification and Assessment strives to break through the bottleneck problems of TCM science and technology.The main research areas are the objectivity and standardization of TCM diagnosis, the identification, evaluation and management of subhealth, and the application of TCM diagnosis technology on evaluation of disease and rehabilitation, etc.The laboratoryalways focuses on combining multidisciplinary technologies such as computer, information processing, artificial intelligence, and so on to research the objectivity and standardization of TCM diagnosis. In order to solve problems constraining the development of TCM, the laboratory has strengthened the innovative research and technology integration, attracted and trained outstanding talents, transformed technology achievements to business, and improved the level of TCM services.

The laboratory has achieved remarkable results in team building and talent training. It has built a team of academic leaders with professional skills and deep academic attainments, and trained a group of young scholars with innovative courage and outstanding professional abilities. The laboratory is composed of professionals in TCM, engineering, computer science, medical statistics, immunology, biology, etc. The proportion of talents holding senior professional titles is high up to 85%, furthermore, 94% have master's or doctor's degree.

In recent five years, the Shanghai Key Laboratory of Health Identification and Assessment has been granted more than 30 million CNY research funds, which are from the Thirteenth National Keypoint Research and Invention Program, National Natural Science Foundation of China, Special Technical Standards of Shanghai Municipal Science and Technology Commission, etc. The laboratory has won one first prize of Shanghai City Technology Advance Award, one second prizes of Science and Technology Award of Chinese Society of Integrated Traditional and Western Medicine, and one second prize of Science and Technology Award of Chinese Society of Traditional Chinese Medicine. The laboratory has published more than 300 academic papers, including 31 SCI papers, and obtained eight authorized national invention patents. The lab has also made breakthroughs in international standardization. It has participated in International Organization for Standardization (ISO), and released three international standards for TCM diagnosis (ISO/TR 20498-5, ISO23961-1, ISO23961-2), leading the research of the international standardization of TCM diagnosis.

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中醫藥文化

CHINESE MEDICINE AND CULTURE

ISSN 2589-9627

9 772589 962222 12>

订阅方式 邮箱: tcmoverseas@126.com 电话: 021-51322295 邮发代号: 4-968 国内定价: 50.00元/期 4期/年