

The Theoretical Foundation and Modern Innovation of Traditional Chinese Medicine Culture Transmission

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ABSTRACT

This study explores the inheritance and innovation of traditional Chinese medicine culture, and focuses on the unique philosophical basis, therapeutic concepts and the integration and development of traditional Chinese medicine with modern medicine and other traditional medical systems. This paper discusses the challenges and opportunities facing the Chinese medicine culture, especially the application of modern technologies such as big data and artificial intelligence in the digitalization and internationalization of Chinese medicine. At the same time, this paper also discusses the multi-disciplinary integration of traditional Chinese medicine in modern society, especially the combination of ecological medicine and social and cultural research, which promotes the innovation and development of traditional Chinese medicine in the field of global health.

KEYWORDS

Traditional Chinese medicine culture; Inheritance and innovation; Modern medicine; Big data; Artificial intelligence; Interdisciplinary integration; globalize

1 Introduction

1.1 Importance and uniqueness of Chinese medicine culture

Traditional Chinese medicine culture is the crystallization of thousands of years of historical wisdom of the Chinese nation. It is not only a medical practice, but also a comprehensive philosophical system and cultural heritage. In the theory of traditional Chinese medicine, the core concepts such as "harmony between heaven and man" and "balance between Yin and Yang" reflect a deep understanding of the relationship between life, nature and the universe.

This unique theoretical basis makes TCM have significant advantages in disease prevention, health management and life recuperation.

Traditional Chinese medicine has long played a basic medical role in China, and its theory and practice have gradually become international. Under the background of modern medical system emphasizing personalized medicine and holistic health, the holistic view and dialectical treatment of TCM culture have shown important value. For example, research in recent years has revealed the potential of traditional Chinese medicine in chronic disease management and co-existing treatment of multiple diseases. The culture of traditional Chinese medicine also has important social significance. As one of the representatives of Chinese culture, it provides a link for cultural identity and also plays a role in global health governance and cross-cultural communication. With the promotion of the Belt and Road Initiative, traditional Chinese medicine has gradually become an effective medium to promote health cooperation and cultural exchanges.

1.2 Challenges and opportunities faced by TCM inheritance

As an important part of traditional Chinese culture, traditional Chinese medicine has a history of thousands of years and rich medical theories. However, in today's rapidly developing society, the inheritance of traditional Chinese medicine faces many challenges. First of all, with the popularization of modern medical system and the influence of globalization, the concept of Western medicine has occupied a dominant position, leading to the gradual neglect or marginalization of traditional Chinese medicine theory and practice in many countries and regions. Awareness of and interest in traditional Chinese medicine, especially among the younger generation, has declined, putting this valuable cultural heritage at risk.

The language system and cultural characteristics of traditional Chinese medicine also constitute obstacles to its inheritance. TCM terms and concepts often carry strong cultural imprints, such as concepts such as "Yin and Yang" and "qi and blood", which are not only difficult to translate into other languages, but may also be difficult for outsiders to understand due to the lack of a common cultural background. Such language and cultural barriers limit the global dissemination and cognition of Chinese medicine knowledge, especially in cross-cultural communication, many traditional Chinese medicine terms and treatment methods can not be accurately interpreted and applied.

However, the progress of modern technology has brought new opportunities for the inheritance and innovation of

TCM. With the development of big data, artificial intelligence and digital technology, more and more traditional Chinese medicine classics have been digitally preserved and disseminated through network platforms. In addition, the combination of modern scientific methods and traditional Chinese medicine theories has gradually enabled us to verify and interpret the therapeutic effects of traditional Chinese medicine with modern scientific and technological means, which not only provides a theoretical basis for the modernization of traditional Chinese medicine, but also promotes the application and influence of traditional Chinese medicine in the global health field. Through these innovative means, traditional Chinese medicine is expected to find a more suitable space for survival and development in modern society, so as to achieve a wider inheritance (Liu et al., 2018).

2 Theoretical basis of traditional Chinese medicine cultural inheritance

2.1 Philosophical basis of Chinese medicine culture

The philosophical foundation of TCM culture is deeply rooted in ancient Chinese philosophical systems, especially Taoism, Confucianism and the theory of Yin-yang and the five elements. These ideas not only shaped the theoretical system of TCM, but also influenced the use and expression of TCM terms. The theoretical system of traditional Chinese medicine emphasizes integrity, dialectic and harmony with nature, which embodies the philosophical thought of "unity of nature and man".

From the perspective of language and culture, the terms and expressions of Chinese medicine have profound philosophical connotations. The uniqueness of Chinese medicine terms is closely related to its philosophical foundation, especially through the language of Chinese medicine, the philosophical thoughts behind it can be revealed. Dian-Gang Liu et al. (2018) pointed out that the translation and inheritance of TCM terms are inevitably influenced by the cultural and linguistic characteristics of TCM. The linguistic and cultural characteristics of TCM show the characteristics of "integrity" and "dialectical" in the formation, use and understanding of terms, which determines the particularity of TCM language in translation and cross-cultural communication (Liu et al., 2018). For example, concepts such as "qi", "Yin and Yang" and "five elements" are not only the core of traditional Chinese medicine theory, but also the carriers of philosophical ideas conveyed in language expression.

At the same time, Zhang and Li (2021) emphasize in their study that there is a strong link between the philosophical underpinnings of TCM and its practice, especially in the application of acupuncture and other therapeutic methods. The philosophy of Chinese medicine emphasizes the harmonious relationship between man and nature, which is reflected in the holistic diagnosis and treatment methods of Chinese medicine. The essence of TCM terminology lies in the expression of philosophical ideas through language, which is an inseparable part of TCM culture and the key to its inheritance.

Therefore, understanding the philosophical basis of TCM requires not only a study of its theoretical framework, but also an in-depth analysis of the linguistic and cultural characteristics of TCM. This is of great significance for the modern inheritance and international dissemination of traditional Chinese medicine culture.

2.2 Holistic view of TCM and treatment based on syndrome differentiation

The holistic treatment concept of traditional Chinese medicine emphasizes the interconnection and coordination of all parts of the body, believing that the human body is an organic whole, and various physiological and pathological phenomena are closely related to the balance and coordination of the whole. The treatment method of traditional Chinese medicine is based on syndrome differentiation, that is, personalized diagnosis and treatment according to the overall situation of the patient. This concept stems from the philosophy of "harmony between heaven and man" in traditional Chinese medicine, which believes that humans and nature are interrelated, and that factors such as the environment inside and outside the human body and climate change will affect the state of health.

Jia Wei et al. (2014) discussed the combination of modern metabolomics and the holistic treatment concept of traditional Chinese medicine in the book *Metabolomics in Modern Health Sciences and Traditional Medicine*. As an important field of modern medical research, metabolomics can reveal the changes of material metabolism in the human body, and this change is consistent with the syndrome differentiation and treatment of traditional Chinese medicine. Traditional Chinese medicine emphasizes the identification of Yin and Yang imbalance in the body, qi and blood obstruction and other factors to guide treatment. This is similar to the research method of modern metabolomics, which comprehensively analyzes the overall metabolic state of the human body to find the root cause of diseases and take corresponding treatment measures. Therefore, metabolomics provides modern scientific and technological support for the holistic view of TCM, and further validates the scientific and operability of the holistic treatment concept of TCM (Wei et al., 2014).

Yang Jing-Wen et al. (2014) proposed in their study that acupuncture, as an important part of TCM treatment, embodies the holistic treatment concept of TCM. Acupuncture treatment does not only focus on local symptoms, but by

stimulating specific meridians and acupuncture points to regulate the circulation of qi and blood throughout the body and restore the body's balance. Studies have shown that the therapeutic effect of acupuncture is not only reflected in alleviating local symptoms, but also can achieve the purpose of reconciling Yin and Yang and balancing qi and blood by adjusting the overall physiological function (Yang et al., 2014). This process fully embodies the core concept of "treating no disease" and "holistic treatment" of traditional Chinese medicine, that is, not simply treating the lesion, but restoring health through overall adjustment.

Compared with the local treatment methods of modern medicine, the holistic treatment concept of Chinese medicine pays more attention to the whole and systematic, emphasizing the restoration of the balance and function of the body as a whole. This unique treatment method not only helps to relieve symptoms, but also pays more attention to the conditioning and prevention of causes, reflecting the profound wisdom of TCM treatment.

2.3 Classification and core value of traditional Chinese medicine knowledge

The traditional knowledge system of TCM is huge and complex, covering the whole process of planting, collection, processing, compatibility and use of medicinal materials. The core value of TCM lies in its systematicness and flexibility, especially in its classification system and theoretical framework. The theory of traditional Chinese medicine not only relies on the study of the characteristics of a single drug, but also emphasizes the interaction between drugs and the human body, paying attention to the changes in the condition and the treatment needs brought about by individual differences of patients.

According to the study of Zhao Yihang et al. (2024), one of the core theories of traditional Chinese medicine is the drug interaction and "dynamic processing theory". Taking aconite and licorice as an example, the treatment of these two herbs not only pays attention to their individual characteristics, but also considers the changes in their effectiveness in the interaction. In the theory of traditional Chinese medicine, aconite is used to warm Yang to dispel cold, return Yang to rescue the reverse, while licorice enhances the effect of other drugs by "harmonizing the medicinal properties". The compatibility of this drug not only helps the effectiveness of the drug, but also minimizes the negative reactions between drugs. The principles of "drug compatibility" and "dose regulation" embodied in this process are the essence of traditional Chinese medicine knowledge system.

Traditional Chinese medicine also has a strong holistic view and the characteristics of syndrome differentiation. In patients with different pathological states and different constitutions, the same drug or drug combination may play a different effect, which requires doctors to adjust the prescription flexibly during the diagnosis and treatment process, and formulate a personalized treatment plan through a comprehensive evaluation of the condition. This individualized treatment mode of Chinese medicine is in sharp contrast to the symptom-oriented treatment mode of Western medicine, which fully embodies the comprehensiveness and comprehensiveness of its treatment.

The theory of dynamic transformation and compatibility of medicinal materials actually reflects the deep understanding of natural laws of the TCM system. This theory is not only a guide to the use of drugs, but also the embodiment of the philosophy foundation of traditional Chinese medicine culture - the holistic view and dynamic balance. In modern society, these traditional knowledge is gradually integrated into the framework of modern medicine and science, showing more and more strong practical and application value.

3 Theoretical and technological innovation of TCM modernization

3.1 Application of big data and artificial intelligence in TCM inheritance

With the continuous progress of science and technology, especially the rapid development of big data and artificial intelligence (AI) technology, modern science and technology has become an important force to promote the inheritance of traditional culture, especially traditional Chinese medicine. As an important part of traditional Chinese culture, traditional Chinese medicine has a history of thousands of years and carries a wealth of medical theory and practical experience. However, with the modernization of society, traditional Chinese medicine is faced with a series of problems such as knowledge gap and insufficient information transmission. Therefore, how to promote the digital protection and inheritance of traditional Chinese medicine through modern science and technology, especially big data and artificial intelligence technology, has become an important issue at present.

The development of big data technology enables massive amounts of medical data to be collected, collated and analyzed. In the field of traditional Chinese medicine, tens of thousands of medicinal materials, prescriptions, symptoms, medical records and other data can be processed and stored through big data technology, so as to systematize and standardize traditional Chinese medicine theory. Through the analysis of historical cases, classical medical books and traditional Chinese medicine prescriptions, researchers can discover hidden rules and information, which can provide references for modern clinical practice. This data-driven research approach not only enhances the scientific nature of TCM

theory, but also provides strong support for its inheritance. For example, Li Yanwei, Liu Ying and Wen Yulong (2022) proposed that algorithms based on big data and deep learning can help traditional Chinese medicine discover more potential treatment modes in the digital process, and enable these treatment plans to be optimized through algorithms, thus improving the accuracy and effect of clinical diagnosis and treatment.

On the other hand, the application of artificial intelligence technology also brings new possibilities for the inheritance of traditional Chinese medicine. The core concept of TCM treatment is "syndrome differentiation and treatment", that is, according to the patient's physique, condition and other factors, choose the appropriate treatment plan. However, because traditional Chinese medicine diagnosis relies on the rich experience and intuition of doctors, it is subjective and uncertain to a certain extent. Through the learning of massive data, artificial intelligence technology can analyze a large number of medical records and treatment plans in a short time, so as to provide doctors with more accurate diagnosis basis. AI technology can analyze a patient's condition through machine learning to provide personalized treatment recommendations. At the same time, AI can also analyze ancient Chinese medicine books, prescriptions and cases through natural language processing technology and translate them into modern language, making the knowledge of traditional Chinese medicine easier to understand and apply.

AI technology can also assist TCM doctors to make clinical decisions through intelligent diagnostic systems. For example, artificial intelligence can analyze the symptoms and signs of patients, combined with the huge knowledge base of traditional Chinese medicine, propose possible causes and treatment plans, and provide references for doctors. This not only improves the efficiency of TCM diagnosis and treatment, but also makes the knowledge of TCM better inherited and applied.

3.2 Research on traditional Chinese medicine processing and dynamic component transformation

Chinese medicine processing science is an important part of Chinese medicine, which plays a crucial role in the play of drug efficacy and therapeutic effect. With the progress of modern science and technology, especially the development of chemistry, pharmacology and modern biotechnology, the research of TCM processing has ushered in a new stage of modern exploration. The traditional Chinese medicine processing method has formed a unique theoretical system through the accumulation of experience and long-term clinical application. However, traditional processing theory often relies on experience and intuition, which exposes some problems that need to be improved and optimized under the background of modern medical development. Therefore, the introduction of modern science and technology, especially big data, chemical analysis technology and dynamic component transformation research, has provided scientific basis for TCM processing and promoted the modernization process in this field.

According to the study of Zhao Yihang et al. (2024), complex transformations and interactions occur in the active components of TCM during the processing of TCM. In the process of processing Chinese medicine, a series of new chemical components are formed through physical, chemical and biological effects, which may change the pharmacological activity of medicinal materials. For example, during processing, some ingredients may be converted into active compounds with stronger potency, while others may be degraded into more absorbable forms that increase potency. Through modern analysis technology, researchers can more accurately track the changes of components in the process of TCM processing, and provide a basis for optimizing the processing technology of TCM. Using big data analysis and chemical mass spectrometry technology, researchers can quantitatively analyze the chemical composition changes of each medicine during processing, and further reveal the influence of different processing methods on drug efficacy.

Dynamic component transformation research is an important direction in the exploration of TCM processing modernization. The active ingredients of traditional Chinese medicine do not appear immediately after processing, but are gradually released through dynamic changes under specific processing conditions. Through the study of dynamic component transformation, scientists can reveal the change path, change rate and change mechanism of components during processing. For example, changes in temperature, time and solvent during processing will directly affect the transformation process of chemical components in medicinal materials, and then affect the biological activity of drugs. Through the in-depth study of these dynamic processes, the processing technology of traditional Chinese medicine can be further improved to ensure the safety and effectiveness of traditional Chinese medicine in treatment.

The modern processing method has also laid the foundation for the standardization, standardization and industrialization of traditional Chinese medicine. By studying the dynamic component transformation in the process of TCM processing, more refined control means can be provided for the production process of TCM to ensure that each batch of medicinal materials can reach the same quality standards, which is of great significance for the clinical application and global promotion of TCM.

3.3 Internationalization of Chinese medicine from a cross-cultural perspective

With the advancement of globalization, cross-cultural communication is becoming more and more important. As a

treasure of Chinese traditional culture, TCM has made remarkable progress in internationalization in recent years. Through the spread and development of traditional Chinese medicine, countries around the world have gradually realized its unique advantages in disease prevention, treatment and health management. Especially in some countries and regions, traditional Chinese medicine has gradually become an important supplement to the local medical system, and even formed a wide audience. In this process, the introduction of cross-cultural perspectives not only contributes to the effective dissemination of TCM knowledge, but also promotes the globalization of TCM theory and practice.

From a cross-cultural perspective, the internationalization of Chinese medicine faces many challenges and opportunities. First of all, cultural differences are one of the main obstacles for TCM to enter the international market. Traditional Chinese medicine has a profound cultural background and philosophical system, such as the concepts of Yin and Yang and the five elements, Qi and blood channels and collaterals, which are often very different from the concepts of Western medicine such as anatomy and pathology. Therefore, in the process of internationalization, how to overcome language barriers, cultural misunderstandings and conceptual conflicts has become the key to promote the internationalization of TCM. In order to overcome this problem, some scholars and experts began to try to localize the translation and adaptation of TCM knowledge from the perspective of culture and language. For example, in the promotion of acupuncture treatment in Western countries, researchers gradually realized the need to effectively link the principles of acupuncture with Western medical treatment methods, so that Western patients can more easily understand and accept the therapeutic effects of acupuncture.

The modernization and scientific development of Chinese medicine is an important approach to its internationalization. With the deepening of modern medical research, many traditional Chinese medicine treatment methods have been validated by modern science and have been recognized worldwide. For example, some of the active ingredients in traditional Chinese medicine, such as ginseng, Astragalus and Ginkgo biloba, have been proven to have significant antioxidant, anti-inflammatory and immunomodulatory effects, and have been applied in a number of international clinical studies. The provision of this scientific basis has significantly improved the trust of TCM in the international community. At the same time, more and more transnational cooperative research projects and the establishment of international academic exchange platforms for TCM have also promoted the international dissemination and development of TCM.

However, the internationalization of TCM is not only about the spread of knowledge and technology, but also about the exchange of cultural identity and values. In this process, the cultural value of traditional Chinese medicine needs to be fully respected and understood. As mentioned in the literature, under different cultural backgrounds, the acceptance of TCM is influenced by many factors, including cultural identity, education system, social needs, etc. (Kloppenburger et al., 2014). Therefore, to promote the internationalization of TCM, it is necessary not only to rely on scientific research and technological innovation, but also to take into account the cultural differences of different countries and adopt adaptive communication strategies.

In this process, international Chinese medicine needs to balance the inheritance of its traditional culture with the innovation of modern medical technology, so as to retain its cultural characteristics and integrate into the global medical system. Through multi-party cooperation and research, traditional Chinese medicine will occupy a more important position in the global health system and make unique contributions to human health.

4 Cross-integration of traditional Chinese medicine and multi-disciplines

With the development of global medicine, the combination of traditional medicine and modern medicine has become an important trend in recent years. Traditional Chinese medicine, with its unique theoretical system and treatment methods, can make up for each other's shortcomings in the combination of modern medicine. For example, traditional Chinese medicine provides long-term treatment through holistic conditioning, acupuncture and herbal remedies, while modern medicine manages conditions with drugs, which combine to provide a more comprehensive treatment plan.

The technological progress of modern medicine, such as imaging and genetics, has provided a new perspective for the clinical application of traditional Chinese medicine. Big data analytics and clinical trials help to evaluate the effectiveness and safety of traditional Chinese medicine more scientifically, further promoting the combination of the two, especially in the treatment of chronic diseases and cancer has achieved remarkable results.

Traditional Chinese medicine is highly compatible with ecological medicine, emphasizing the harmonious symbiosis between man and nature, and paying attention to the impact of external factors such as the environment and seasons on health. TCM responds to these changes by regulating "qi and blood" and "Yin and Yang", providing a sustainable health wisdom.

In modern society, the concept of personalized and integrated health has attracted more attention and application of traditional Chinese medicine, promoted its deep integration with modern medicine, ecological medicine and other fields, and brought new opportunities for global health.

5 Conclusion and prospect

The inheritance and innovation of traditional Chinese medicine culture is at a critical stage, with deepening global understanding of it and cross-cultural and interdisciplinary cooperation to promote its development. Big data, artificial intelligence and other technologies will promote the digitalization, precision and personalized development of TCM, and effectively protect and pass on TCM knowledge and practice.

Traditional Chinese medicine should be integrated with modern medicine, ecological medicine and social and cultural research to solve the health problems that modern medicine cannot cope with. By strengthening international cooperation, TCM will play an important role in global health and medical innovation.

In short, the inheritance and innovation of traditional Chinese medicine is a process of cultural and global cooperation. Respect for tradition combined with modern technology can ensure its sustainable development and contribute to global health.

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