

Research on the integration of Traditional Chinese Medicine nutritional theory and modern nutrition

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Abstract. Traditional Chinese Medicine (TCM) nutrition, with Yin-Yang and Five Elements, homology of medicine and food, and dietotherapy based on syndrome differentiation as its core, is the crystallization of wisdom from the in-depth integration of the TCM system and dietary culture. This paper systematically sorts out the theoretical origin, core principles and practical application of TCM nutrition, comparatively analyzes the commonalities and complementarities between the holistic concept and balance concept of TCM and modern nutrition, and explores the integration path of TCM nutrition and modern nutrition by combining the modern scientific verification of homology of medicine and food substances, nutritional intervention for chronic diseases and health management practice. The research shows that TCM nutrition emphasizes the correspondence between human and nature, visceral regulation and the priority of dietary nourishment, which is highly consistent with the concepts of balanced nutrition, precise intervention and chronic disease prevention and control in modern nutrition; the integration of the two can construct a nutritional system with both oriental characteristics and scientific evidence, providing more appropriate theoretical and practical support for national health.

Keywords: TCM nutrition, homology of medicine and food, dietotherapy based on syndrome differentiation, modern nutrition, health management

1. Introduction

Nutrition is the core element for maintaining life activities and ensuring physical health. Modern nutrition takes nutrient analysis, metabolic mechanism and dietary guidelines as its framework, focusing on the quantitative supply and functional verification of macronutrients and micronutrients; guided by the holistic concept, TCM nutrition combines the nature, flavor, meridian tropism and efficacy of food with human constitution, visceral functions and natural rhythms, forming a unique theoretical and practical system of "integration of medicine and food, and incorporation of medical principles into dietary practices". From the dietary structure of "cereals for nourishment, fruits for supplementation, meat for enrichment, and vegetables for sufficiency" proposed in *Huangdi Neijing (Yellow Emperor's Internal Classic)* [1], to the special chapter on "dietotherapy" in *Sun Simiao's Qianjin Yaofang (Essential Prescriptions Worth a Thousand Gold)* [2], and then to the inheritance and development of dietetic materia medica in successive dynasties, TCM nutrition has

been verified by thousands of years of practice and become an important part of China's traditional health culture.

At present, problems such as the high incidence of chronic diseases, unbalanced dietary structure and the expansion of the sub-health population have become prominent, and nutritional intervention oriented to a single nutrient can no longer meet the personalized health needs. The concepts of holistic conditioning, preventive treatment of disease and dietotherapy based on syndrome differentiation in TCM nutrition complement the development direction of precision, individuation and functionalization in modern nutrition. Based on classic TCM theories and modern research evidence, this paper expounds the core connotation of TCM nutrition, analyzes its integration points and application value with modern nutrition, and provides a theoretical reference for constructing a nutrition and health system with Chinese characteristics and promoting the innovative development of the nutrition discipline.

2. The theoretical foundation and core principles of TCM nutrition

2.1. Theoretical origin: classic foundation and system formation

TCM nutrition originated from the ancient agricultural civilization, and the story of "Shennong Tasting Hundreds of Herbs" initiated the exploration of the homology of medicine and food. *Huangdi Neijing (Yellow Emperor's Internal Classic)* constructed the theoretical framework of TCM nutrition, put forward the core ideas such as Yin-Yang balance, correspondence between human and nature, and the entry of five flavors into five zang-organs, clarified that "health is maintained when Yin and Yang are in a state of dynamic balance", and established the fundamental goal of dietary conditioning. *Shennong Bencaojing (Shennong's Classic of Materia Medica)* recorded 365 kinds of medicines and foods, divided them into three grades of superior, middle and inferior, defined the nature, flavor, efficacy and taboos of food, and laid the foundation of dietetic materia medica. Zhang Zhongjing integrated the combination of medicine and food into clinical practice in *Shanghan Zabing Lun (Treatise on Cold Damage and Miscellaneous Diseases)* and *Jinkui Yaolue (Synopsis of the Golden Chamber)*, created classic dietotherapy prescriptions such as Angelica Sinensis, Ginger and Mutton Decoction and Wheat, Jujube and Licorice Decoction, and emphasized that "diet enhances the efficacy of medicines, and medicines exert their effects by virtue of diet". Sun Simiao set up a special volume on "dietotherapy" in *Qianjin Yaofang (Essential Prescriptions Worth a Thousand Gold)*, proposing that "A physician must first thoroughly understand the etiology of a disease and identify its causes, treat it with dietotherapy, and resort to medicines only when dietotherapy fails", which established the clinical principle of giving priority to dietotherapy. Later monographs such as *Shiliao Bencao (Dietetic Materia Medica)* and *Bencaogangmu (Compendium of Materia Medica)* continuously enriched food varieties, compatibility methods and application scenarios, forming a systematic and complete TCM nutrition system.

2.2. Core principles: holistic concept and dietotherapy based on syndrome differentiation

2.2.1. Yin-Yang balance and four natures, five flavors as well as meridian tropism

TCM holds that food has four natures (cold, hot, warm and cool) and five flavors (sour, bitter, sweet, pungent and salty), corresponding to the waxing and waning of Yin and Yang in the human body and the preferences of the zang-fu organs. The four natures regulate the balance of cold and heat in the body; for example, warm and hot foods (ginger, mutton, longan) warm Yang and dispel cold, suitable for those with Yang deficiency and fear of cold; cold and cool foods (mung bean, bitter melon, tremella) nourish Yin and reduce fire, suitable for those with Yin deficiency and internal heat. The five flavors correspond to the five zang-organs, namely "sour enters the liver, bitter enters the heart, sweet enters the spleen, pungent enters the lung, and salty enters the

kidney", and the coordination of visceral functions is achieved through the harmonization of the five flavors. The meridian tropism theory clarifies the visceral and meridian systems that food acts on in a targeted manner; for example, wolfberry enters the liver and kidney meridians to nourish the liver and improve eyesight, and Chinese yam enters the spleen and stomach meridians to invigorate the spleen and replenish Qi, realizing precise conditioning [3].

2.2.2. Correspondence between human and nature and treatment based on three factors

TCM nutrition emphasizes the unity of the human body and the natural environment, and abides by the principle of dietotherapy based on time, location and individual constitution. Dietotherapy based on time: in spring, pungent and sweet foods for dispersing (Chinese chives, Chinese toon) are taken to promote the ascension of liver Qi; in summer, light foods for clearing dampness and promoting diuresis (wax gourd, coix seed) are taken to clear heat and relieve summer heat; in autumn, moist and warm foods for promoting the production of body fluid (lily bulb, pear) are taken to moisten the lung and prevent dryness; in winter, warm and tonic foods for nourishment (mutton, walnut) are taken to tonify the kidney and store essence. Dietotherapy based on location: more dampness-eliminating ingredients are used in the humid and hot southern areas, and more middle-warming ingredients are preferred in the cold northern areas, in line with the regional climatic and product characteristics. Dietotherapy based on individual constitution: the diet is adjusted according to age, gender, constitution and occupation; for example, invigorating the spleen and kidney for the elderly, protecting the spleen and stomach for children, tonifying Qi for those with Qi deficiency, and resolving phlegm and eliminating dampness for those with phlegm-dampness constitution, realizing personalized dietary nourishment.

2.2.3 Homology of medicine and food and priority to dietary nourishment

The homology of medicine and food is the core characteristic of TCM nutrition, meaning that most natural substances have both food nutritional and medicinal conditioning effects. The catalogue of homology of medicine and food substances issued by the National Health Commission of the People's Republic of China provides a standardized basis for the dual use of substances as medicine and food. TCM advocates the "preventive treatment of disease", aiming to prevent diseases and improve constitution through daily dietary conditioning and avoid excessive medication, which is consistent with the prevention-oriented concept of modern health management.

3. Analysis of the complementarity between TCM nutrition and modern nutrition

3.1. Consensus of concepts: balance and holism

Modern nutrition emphasizes dietary balance, nutrient synergy and holistic health, which is highly consistent with the Yin-Yang balance and holistic concept of TCM nutrition. The dietary structure of "cereals for nourishment" in TCM corresponds to the balanced supply of whole grains, high-quality protein, fruits and vegetables, and dietary fiber in modern nutrition; the "harmonization of five flavors" in TCM to avoid dietary partiality is consistent with the advocacy of a diversified diet and restriction of high oil, high salt and high sugar in modern nutrition. Both recognize that "dietary imbalance is the root cause of diseases"; for example, excessive consumption of greasy and sweet foods leads to the internal generation of phlegm and dampness in TCM, corresponding to the occurrence of chronic diseases such as obesity, diabetes and metabolic syndrome caused by a high-fat and high-sugar diet in modern nutrition [4].

3.2. Complementarity of advantages: holistic conditioning vs precise quantification

The advantages of TCM nutrition lie in holistic conditioning, constitution identification and dynamic balance, focusing on the improvement of the body's functional state, and it is suitable for sub-health conditioning, nursing in the recovery period of chronic diseases and long-term health maintenance; the advantages of modern nutrition lie in precise quantification, clear mechanism and sufficient evidence, which clarifies the physiological functions and safe doses of nutrients through nutrient detection, metabolic pathway research and clinical evidence-based medicine, and is suitable for acute nutritional deficiency, nutritional support for severe patients and nutritional intervention for special populations. The complementarity of the two can realize the dual value of "macro holistic conditioning + micro precise intervention" [5].

3.3. Practical integration: from experience to evidence-based practice

Modern analytical technologies provide scientific verification for TCM nutrition: ultra-high performance liquid chromatography, mass spectrometry and other technologies analyze the active components of homology of medicine and food substances (wolfberry polysaccharide, astragalus polysaccharide, curcumin, tea polyphenols, etc.) [6]; cell and animal experiments confirm their mechanisms of action such as antioxidant, anti-inflammatory, immune regulation and intestinal flora improvement; clinical studies verify the intervention effect of dietotherapy prescriptions on chronic diseases. For example, wolfberry polysaccharide can enhance immunity and protect the retina, astragalus polysaccharide can improve mitochondrial function and tonify Qi to resist fatigue, and Chinese yam and ophiopogon japonicus polysaccharides can regulate intestinal flora and protect the intestinal barrier, all of which provide modern evidence for the efficacy of TCM nutrition [7].

4. Modern application and practice of TCM nutrition

4.1. Nutritional intervention for chronic diseases

TCM nutrition has shown unique value in the prevention and control of chronic diseases such as type 2 diabetes, obesity, hypertension and non-alcoholic fatty liver disease. The intervention for diabetes follows the principle of "invigorating the spleen and replenishing Qi, nourishing Yin and moistening dryness", selecting homology of medicine and food ingredients such as Chinese yam, pueraria lobata, bitter melon and buckwheat, combined with a low-sugar and high-fiber diet to assist in blood glucose regulation; the intervention for obesity adheres to the principle of "invigorating the spleen and eliminating dampness, resolving phlegm and reducing fat", using ingredients such as coix seed, adzuki bean, lotus leaf and hawthorn, combined with energy-restricted diet to improve metabolic disorders; the intervention for hypertension focuses on "calming the liver and suppressing Yang, clearing heat and nourishing Yin", selecting ingredients such as celery, chrysanthemum, cassia seed and black fungus to assist in stabilizing blood pressure. TCM nutritional intervention is not limited to a single nutrient, but improves the metabolic internal environment through holistic conditioning, which is in line with the needs of long-term management of chronic diseases [8].

4.2. Sub-health and constitution conditioning

Most sub-health populations present with constitutional biases such as Qi deficiency, Yin deficiency, Yang deficiency and phlegm-dampness, and TCM nutrition achieves precise conditioning through dietotherapy based on syndrome differentiation. For Qi deficiency constitution (fatigue, susceptibility to colds), Astragalus Stewed Chicken and Millet and Red Date Congee are taken to tonify Qi and invigorate the spleen; for Yin deficiency constitution (dry mouth, tidal fever), Lily Bulb and Tremella Soup and Dendrobium and

Ophiopogon Japonicus Tea are taken to nourish Yin and promote the production of body fluid; for phlegm-dampness constitution (obesity, drowsiness), Wax Gourd and Kelp Soup and Pericarpium Citri Reticulatae and Poria Cocos Tea are taken to eliminate dampness and resolve phlegm. Compared with the general dietary recommendations of modern nutrition, TCM constitutional dietary nourishment is more in line with individual differences and improves the conditioning effect [9].

4.3. Medicated diet and health industry

Medicated diet is the core carrier of the industrialization of TCM nutrition, expanding from traditional family dietotherapy to the fields of catering, food and health care. Standardized medicated diet formulas, functional foods (wolfberry polysaccharide drinks, Chinese yam meal replacement powder, hawthorn digestion pills) and health care dietary schemes transform the wisdom of TCM nutrition into accessible health products for the public. At the same time, the "Internet + nutrition" platform combines TCM constitution identification with modern nutrition assessment to provide personalized dietary nourishment schemes, promoting the scientific, popular and standardized development of TCM nutrition.

5. Challenges and countermeasures for the development of TCM nutrition

5.1. Main challenges

First, the modernization of theories is insufficient, and the traditional theories of four natures, five flavors, meridian tropism and constitution lack unified modern scientific interpretation and quantitative standards; second, the evidence-based evidence is insufficient, most dietotherapy prescriptions rely on experience inheritance, and large-sample, multi-center, randomized controlled clinical studies are scarce; third, the standardization level is low, and the medicated diet market has problems such as non-standard formulas, exaggerated efficacy and uneven quality of ingredients; fourth, there are deviations in popular science and cognition, the public holds extreme perceptions of TCM nutrition as either "mystical" or "ineffective", and there is a shortage of professional talents [10].

5.2. Development countermeasures

Theoretical innovation and scientific interpretation: Combine systems biology, intestinal microecology and nutritional genomics to interpret the mechanism of action of TCM nutrition, and establish a quantitative evaluation system for four natures, five flavors, meridian tropism and constitution identification.

Evidence-based research and standard formulation: Carry out clinical evidence-based research on homology of medicine and food substances and classic dietotherapy prescriptions, and formulate industry standards and norms for medicated diet formulas, ingredient use and efficacy evaluation.

Talent training and popular science communication: Strengthen the training of interdisciplinary talents in TCM nutrition and modern nutrition, break cognitive misunderstandings through authoritative popular science, and promote the scientific concept of dietary nourishment [11].

Industrial integration and standardized supervision: Promote the in-depth integration of TCM nutrition with the food, catering and health care industries, strengthen market supervision, and ensure product safety and credible efficacy.

6. Conclusion

TCM nutrition is a scientific nutritional system rooted in Chinese traditional culture and verified by thousands of years of practice, with Yin-Yang balance, homology of medicine and food, dietotherapy based on syndrome differentiation and correspondence between human and nature as its core. It is highly consistent and complementary with modern nutrition in terms of concepts, goals and practices. Under the background of national health and chronic disease prevention and control, promoting the in-depth integration of TCM nutrition and modern nutrition is not only the inheritance and innovation of traditional wisdom, but also the inevitable direction of the development of the nutrition discipline. Through scientific interpretation, evidence-based verification, standardization and industrial implementation, TCM nutrition will provide more appropriate, effective and oriental characteristic solutions for personalized health management, chronic disease prevention and control, and national nutrition improvement, contributing to the construction of Healthy China.

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