

# Transmutation Process and Trouble Thinking of the Relationship between Sports and Medicine in China

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## **Abstract:**

The theory of ancient Chinese medicine and the exploration of famous doctors, which promoted the formation of the embryonic form of ‘combination of sports and medicine’. With the rise of the fitness industry, the combination of sports and medicine has been developing continuously, the combination of sports and medicine has entered the initial stage of integration.’ Fourteenth Five-Year Plan and 2035 Vision Goal’ proposed ‘integration of health and sports’. However, integration of sports and medicine was faced with difficulties such as low degree of integration, the medical function of sports is not well understood by the whole people, there is a lack of integration mode of sports and medicine with Chinese characteristics, and high threshold for inter-disciplinary talents. Therefore, the policy of ‘integration of sports and medicine’ can be widely implemented to improve the degree of physical and medical integration; Break away from the prejudice of sports and medical treatment, and form equal status; Explore the model of integration of physio-medicine with Chinese characteristics to form a community of sports and medical interests; Adjust the employment threshold for interdisciplinary talents in sports and medicine, avoid the brain drain and other ways to promote the integration of sports and medicine.

**Keywords:** *Sports and Medicine, Transmutation process, Dilemma; Path, China.*

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Sports and medicine are like the wings of a bird and the two wheels of a car, jointly escorting human health<sup>[1,2]</sup>. During the Eastern Han Dynasty, the genius doctor Hua Tuo used the ‘five-animal exercises’ for disease prevention and treatment, thus accelerating the combination of sports and medicine<sup>[3]</sup>. In 2016, the ‘Healthy China 2030’ planning outline (hereinafter referred to as the ‘Outline’) proposed for the first time ‘the integration of sports and medicine’. Documents including ‘National Fitness Program

(2016-2020)', 'Guiding Opinions on Accelerating the Development of the Fitness and Leisure Industry', 'China's Medium and Long-term Plan for the Prevention and Treatment of Chronic Diseases (2017-2025)' emphasize adherence to 'prevention first' and need to strengthen 'integration of sports and medicine'. In October 2020, the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China reviewed and approved the 'Fourteenth Five-Year Plan and 2035 Long-Range Objective', which places 'moving forward the health threshold and deepening the integration of sports and health work' at the prominent position in efforts to build a healthy China and a strong sports country, thus guaranteeing the people's health and priority development. Therefore, in the new era, 'the integration of sports and medicine' and 'the integration of sports and health work' have become a powerful starting point to curb the rise of chronic diseases<sup>[4]</sup> and facilitate the construction of a 'healthy China'<sup>[5]</sup>.

China is currently transiting from 'combination of sports and medicine' to 'integration of sports and medicine', which means it is in the initial exploration stage of 'integration of sports and medicine'<sup>[6,7]</sup>. Although sports and medicine are mutually accepted in the concept with scattered link in practice, the two still take respective interests as the starting point. There are problems such as lack of top-level systems, insufficient coordination, insufficient talent training<sup>[8]</sup>, ideological concepts, policy funds, and management system obstacles<sup>[9]</sup>. A precise point of convergence has not been found to achieve true integration, so it is impossible to jointly solve people's health problems.

The theory of social symbiosis believes that: co-existence lies in all aspects of society, and social progress lies in improving symbiotic relationships. As two heterogeneous symbiosis units, sports and medicine have an asymmetric and reciprocal symbiosis relationship, but the optimal symmetry and reciprocity symbiosis is yet to be formed<sup>[10]</sup>, which hinders the deep integration of sports and medicine. The industrial integration framework proposes that 'integration' is the prerequisite of 'symbiosis'. Without integration, symbiosis is impossible and a community of interests cannot be formed. At the same time, symbiosis function allows convergence on the same value orientation, promotes the further integration of the symbiosis unit, and enables rise to the symbiosis stage<sup>[11]</sup>. Then, 'symbiosis of sports and medicine' represents an advanced stage of 'integration of sports and medicine', and the symbiosis effect promotes the deep integration of the two. Therefore, on the basis of clarifying the connotations of 'combination of sports and medicine', 'integration of sports and medicine', and 'symbiosis of sports and medicine', this study analyzes the origin of 'combination of sports and medicine' and the mechanism of its evolution to 'integration of sports and medicine', and sorts out the real dilemma in 'integration of sports and medicine'. Using the principle of social symbiosis, it proposes an implementation path to continuously promote the co-evolution of the two, accelerate the deep integration of sports and medicine, and achieve the symbiosis of sports and medicine as soon as possible.

## **I. COMBINATION OF SPORTS AND MEDICINE, INTEGRATION OF SPORTS AND MEDICINE, SYMBIOSIS OF SPORTS AND MEDICINE, AND THE RELATIONSHIP CLARIFICATION BETWEEN THE THREE**

### 1.1 Combination of Sports and Medicine

The concept of ‘combination of sports and medicine’ originated in the United States in the 19th century, which advocates the integration of medical elements into fitness clubs<sup>[12]</sup>. In the United Kingdom, it is called the ‘combination of medical treatment and endowment’, which is achieved through medical rehabilitation and medical care<sup>[13]</sup>. Domestic research in this aspect began in 1998 in ‘A Random Talk on Hua Tuo's Combination of Sports and Medicine’. At the beginning of the 21st century, China conducted research on the concept of ‘integration of sports and medicine’, and scholars have different understandings, which are mainly expounded from the following four perspectives:

(1) If we explain from the perspective of abstract concepts, ‘combination of sports and medicine’ is a large health service model different from the traditional and single system<sup>[14]</sup>.

(2) From the perspective of the knowledge system, ‘combination of sports and medicine’ is the combination of numerous knowledge that complements and penetrates each other, including sports health care, sports medicine, rehabilitation medicine, medical nutrition, sports prescription, health assessment<sup>[15]</sup>.

(3) From an operational perspective, ‘combination of sports and medicine’ points to its practical connotation dimension, which means that sports department and medical and health department cooperate and supplement each other in medical examination, physical fitness measurement, and health and rehabilitation to effectively and smoothly popularize medical services, health education, and national fitness in the community<sup>[6]</sup>.

(4) At the disciplinary level, the combination of sports and medicine means the intersection and integration of sports science and medical science, which is not only reflected in the mutual learning and use of technical means in the two disciplines, but also includes the close combination, mutual supplement and mutual penetration of ideas, concepts and other aspects and levels<sup>[16]</sup>. It can be seen that ‘combination of sports and medicine’ is a great health service model in which sports and medicine complement and permeate each other in knowledge, technology and operation.

### 1.2 Integration of Sports and Medicine

In a broad sense, ‘integration of sports and medicine’ refers to all fitness approaches and methods selected based on the combination of medical treatment and sports<sup>[7]</sup>. In a narrow sense, ‘integration of

sports and medicine' aims to build a healthy country and improve the health of the whole people. It combines physical exercise habits with medical care knowledge, which is a result of multi-level and three-dimensional combination of medical field and sports field. Through the model, in-depth linkage is achieved in sports concepts, methods, medical knowledge and technology to jointly promote the national health services<sup>[6]</sup>. 'Integration of sports and medicine' means to apply medical physiology, biochemistry indicators to sports to give play to the role of medical supervision and guidance and guarantee scientific, safe and sustainable sports<sup>[9]</sup>; it represents in-depth and multi-dimensional integration of sports and medicine in the fields of sports science, public health, and clinical medicine. The integration of sports and medicine emphasizes the need to view medical treatment from sports so that we re-understand the nature of the disease. Also, it emphasizes the need to view sports from medical treatment so that we rediscover the functional value of sports. It can be seen that integration of sports and medicine is a kind of dependence or a brand-new mode formed by sports and medical treatment through mutual attraction in the process of communication and contact.

### 1.3 Symbiosis of Sports and Medicine

In 1897, German biologist Soderberg proposed the concept of symbiosis. Symbiosis refers to the close and mutually beneficial relationship formed between two different organisms, in which both obtain benefits in common life but cannot survive separately. There is a 'symbiosis' between any two of the three: animals, plants, fungi (Baidu Encyclopedia). In a symbiotic relationship, one party provides the other party with help for survival, and at the same time receives the other party's help<sup>[17]</sup>. In the 1950s, the theory of symbiosis shifted from biology to social science. It is proposed that the phenomenon of social symbiosis exists universally, which penetrates into all walks of life as the basic existence of human survival and development<sup>[17]</sup>. The theory of social symbiosis considers that symbiosis refers to the relationship between symbiosis units in a certain symbiosis environment which is formed in accordance with a certain symbiosis model. Symbiosis behavior patterns include parasitism, partial benefit symbiosis, asymmetric reciprocal symbiosis and symmetric reciprocal symbiosis. Symbiosis organization models include point symbiosis, intermittent symbiosis, continuous symbiosis and integrated symbiosis, among which symmetric reciprocal symbiosis behavior mode and integrated symbiosis organization method are the most ideal symbiosis modes<sup>[10,17]</sup>. Therefore, symbiosis of sports and medicine refers to the symbiosis relationship formed between the two symbiosis units of sports and medical treatment according to a certain pattern under the premise of symbiosis environment. There is the best compatibility state or the best resource allocation state when sports and medicine achieve symmetry and mutual symbiosis.

### 1.4 Relationship Clarification

'Combination' refers to the close connection between people or things. 'Integration' in the physical

sense means to melt or fuse into one body; in the psychological sense, it means the cognition, emotion or attitude tendency of different individuals or different groups merge into one after a certain collision or contact. Integration is a process of dynamic development. In this process, things aim to reach a new form. It emphasizes the location of the boundary of things and takes the formation of new things as its fundamental sign. 'Symbiosis' focuses on the merging of boundaries between different things related to value. Therefore, to remove boundary barriers between different things, they must first merge together, and then match each other through symbiosis to better adapt to the environment, and ultimately create or realize value as their own responsibility requires. The 'sports' in 'the integration of sports and medicine' means 'sports', and 'medicine' means 'medicine', that is, medical treatment and treatment of diseases. The 'health' of 'integration of sports and health work' refers to 'health work', which refers to personal and social hygiene measures taken to enhance human health, prevent diseases, improve and create production environments and living conditions that meet physiological and psychological needs. 'Integration of sports and health work' emphasizes the integration of sports and health. It can be seen that health work has broader connotation than medicine. In view of the more common use of 'integration of sports and medicine', this paper replaces the newly updated 'integration of sports and health work' with 'integration of sports and medicine'.

#### 1.4.1 Combination of sports and medicine and integration of sports and medicine

1) 'Integration of sports and medicine' indicates the mature stage after exploration and improvement of 'combination of sports and medicine', which is the sublimation and result of 'combination of sports and medicine'<sup>[6,18]</sup>.

2) 'Integration of sports and medicine' is the development stage of 'combination of sports and medicine', which means the establishment of a point of convergence after the sports system and the medical health system effectively link the interests of the two<sup>[8]</sup>. Therefore, 'integration of sports and medicine' is the result of the further development of 'combination of sports and medicine'.

#### 1.4.2 Integration of sports and medicine and symbiosis of sports and medicine

In the cultural field, scholars believe that 'symbiosis' is an advanced stage of 'integration'. For example, cultural integration is a two-way dependence of culture, a form of low-level cultural protection, while cultural symbiosis can be one-way or two-way protection, which is a more advanced form<sup>[19]</sup>. From the perspective of ecology and economy, 'integration' is the prerequisite of 'symbiosis'<sup>[20]</sup>. There is only one consciousness subject in integration, which may be the one before the integration, or it may be a brand-new subject created by the integration, and symbiosis involves two consciousness subjects. Therefore, 'integration of sports and medicine' refers to the main body of sports or medicine, or the formation of a new sports-medicine integration body, while 'symbiosis of sports and medicine' means

that sports and medicine are both the main body, and the two exist on an equal basis. Therefore, symbiosis can promote the deep integration of symbiosis units, which is an ideal integration state. By forming a symmetrical and mutually beneficial symbiosis relationship, sports and medicine can better give play to their respective advantages and characteristics, form a more stable community of interests, and serve human health.

#### 1.4.3 Combination of sports and medicine and symbiosis of sports and medicine

‘Combination of sports and medicine’ is the foundation of ‘integration of sports and medicine’, while the latter is the result and sublimation of the development of the former. The integrated symmetrical and mutual beneficial ‘symbiosis of sports and medicine’ is the advanced stage of ‘integration of sports and medicine’, while ‘integration of sports and medicine’ is the prerequisite for ‘symbiosis of sports and medicine’; ‘combination of sports and medicine’ is a necessary condition for the formation of ‘symbiosis of sports and medicine’, while ‘symbiosis of sports and medicine’ is an upgraded form of ‘integration of sports and medicine’ (See Figure 1).

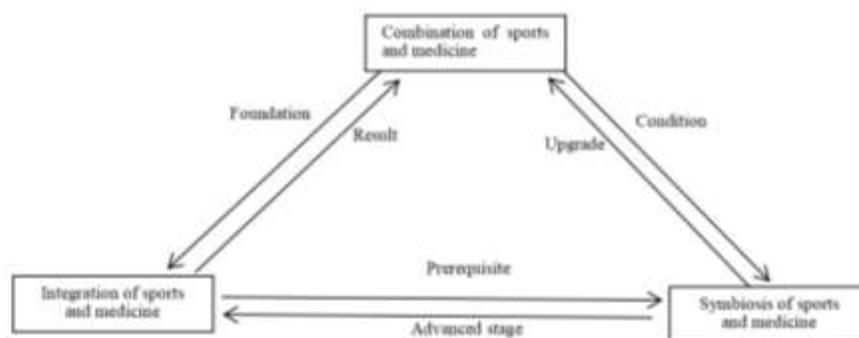


Figure 1 Relation of sports and medical combination, integration and symbiosis

(Resources: Made by the authors)

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(Resources: Made by the authors)

## II. THE EVOLUTION FROM ‘COMBINATION OF SPORTS AND MEDICINE’ TO ‘INTEGRATION OF SPORTS AND MEDICINE’ AND MECHANISM OF THE EVOLUTION FROM

### 2.1 The Evolution from ‘Combination of Sports and Medicine’ to ‘Integration of Sports and Medicine’

Since ancient times, martial arts and traditional Chinese medicine have the same roots and the same

origin, forming a ‘combination of martial arts and medicine’, in which martial arts is the representative of sports, and traditional Chinese medicine is the representative of medical treatment. The combination of the two fully reflects the idea of ‘combination of sports and medicine’<sup>[21]</sup>. By the end of the Eastern Han Dynasty, the genius doctor Hua Tuo used the ‘five-animal exercises’ for disease treatment and accelerated the combination of sports and medicine<sup>[3]</sup>. In the Tang and Song dynasties, China’s medical industry was at its peak, forming specialized departments and branches. When people were sick, they had the habit of seeking medical treatments. A large number of medical theories and writings were spread to Korea, Japan, Central Asia, West Asia, etc. For instance, Jianzhen crossed the ocean to Japan, creating an impact on Chinese medicine in Japan<sup>[22]</sup>. During the Jin and Yuan Dynasties, the government paid great attention to medical development, with doctors’ status improved. However, from the self-seclusion in the late Qing Dynasty to China’s invasion by Western powers, the nation's fortunes declined. At this time, the influx of Western medicine impacted the development of Chinese medicine. People began to treat diseases with the thinking mode of the Western medical system, and Chinese medicine fell into a controversial situation<sup>[23]</sup>. At the same time, wars at home and abroad continued, the people were living in extreme misery, the development of sports faded out of people's vision, so sports and medicine became increasingly alienated. After the founding of New China, the country attached great importance to the physical health of the people. On June 10, 1952, Comrade Mao Zedong wrote the inscription ‘Develop sports and enhance people's physical fitness’, which laid an important ideological foundation for the development of sports and health in China.

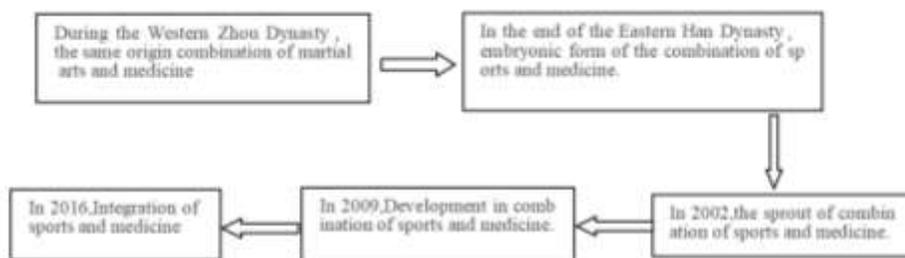


Figure 2 The evolution process from the combination to the fusion of sports and medicine

(Resources: Made by the authors)

Figure 2: The evolution process from the combination to the fusion of sports and medicine

(Resources: Made by the authors)

During the Western Zhou Dynasty, traditional martial arts and traditional Chinese medicine had the same root and the same origin combination of martial arts and medicine. In the end of the Eastern Han Dynasty, the ‘five-animal exercise’ was used for disease treatment, embryonic form of the combination

of sports and medicine. In 2002, the 16th CPC National Congress put national fitness into the work report for the first time. The sprout of combination of sports and medicine. In 2009, the State Council promulgated the 'Regulations on National Fitness'. Development in combination of sports and medicine. Fourteenth Five-Year Plan' and 2035 Long-Range Objectives: Integration of sports and health 'Healthy China 2030 Planning Outline' in 2016. Integration of sports and medicine. Domestic research on 'integration of sports and medicine' appeared in 1998 in 'A Random Talk on Huatuo's Integration of Sports and Medicine'. The research and practice in this area mainly focus on the cultivation of compound talents. It was not until the beginning of the 21st century that 'integration of sports and medicine' was applied to the fitness industry. The relationship between sports and medicine has gone through the following stages:

1) Combination of martial arts and medicine: Traditional martial arts and traditional Chinese medicine have the same root and the same origin. Martial arts and medicine are used together for disease treatment and prevention, thus forming 'combination of martial arts and medicine', an early manifestation of 'combination of sports and medicine'.

2) Combination of sports and medicine: The Embryonic stage: In the end of the Eastern Han Dynasty, the genius doctor Hua Tuo used the 'five-animal exercises' for disease treatment in an effort to explore the positive role of sports in disease treatment, and put it into practice, forming the embryonic form of 'Integration of Sports and Medicine'. The sprout stage: In 2002, the 16th National Congress of the Communist Party of China included the National Fitness in its work report for the first time, officially opening the modern 'combination of sports and medicine'<sup>[24]</sup>. The Development stage: In 2009, the State Council promulgated the 'Regulations on National Fitness', which is an important symbol of the further legalization and standardization of national fitness<sup>[25]</sup>.

3) Integration of sports and medicine: In 2016, the 'Healthy China 2030' strategy promoted the evolution from 'combination of sports and medicine' to 'integration of sports and medicine'.

4) Integration of sports and health work: In 2020, the 'Fourteenth Five-Year Plan for National Economic and Social Development of the People's Republic of China and Outline of 2035 Long-Range Objectives' proposes 'integration of sports and health work', which sets forth higher requirements for the in-depth integration of sports and medicine.

2.2 Mechanism of the Evolution from 'Combination of Sports and Medicine' to 'Integration of Sports and Medicine'

2.2.1 Ancient Chinese medicine theory and exploration of famous doctors promote the integration of sports and medicine

In the Western Han Dynasty, traditional Chinese medicine masterpiece ‘Inner Canon of Yellow Emperor’ mentioned that ‘the best doctors value the prevention of disease’<sup>[26]</sup>. The silk painting ‘Daoyin Graph’ unearthed from the Han tomb records 44 Daoyin actions and methods. The Qing Dynasty medical treatise ‘Internal Strength Illustration’ puts forward: ‘Heaven and earth are yin and yang, yin and yang are about motion and stillness. The human body is yin and yang; yin and yang means motion and stillness. ‘Combination of motion and stillness’ has the effect of repelling diseases and strengthening the body<sup>[27]</sup>. These traditional Chinese medicine theories provide conceptual support for the ‘integration of sports and medicine’. During the Eastern Han Dynasty, wars, natural disasters led to frequent diseases, with corpses littered in the fields. Due to lack of doctors and medicines, good physical fitness was required to resist diseases. During this special period, genius doctor ‘Hua Tuo’ actively conducted explorations and invented the ‘five-animal exercises’, put it into practice, thus opening the door of ‘Integration of Sports and Medicine’. Ge Hong’s life conservation via Qigong in the Jin Dynasty, and the Sui Dynasty Chao Yuanfang’s ‘Theories of the Sources of Diseases’ which recorded 289 articles and 213 specific methods for ‘Health Prescriptions’ or ‘Daoyin’ reflect that sports and medicine have been used as two important means for disease prevention and treatment since ancient China. Therefore, these traditional Chinese medicine works and the practice of famous doctors have contributed to the complementarity between traditional Chinese sports and traditional Chinese medicine, which accelerates ‘combination of sports and medicine’.

2.2.2 The fitness industry makes active practice to boost the development of the combination of sports and medicine

Theory is the cornerstone of practice, and the broad and profound Chinese medicine culture provides direction guidance for the ‘combination of sports and medicine’ in domestic practice. Since the reform and opening up, China’s economy has grown rapidly and people’s living standards have continually improved. At the same time, non-communicable diseases such as obesity, cardiovascular and cerebrovascular diseases, diabetes and other chronic diseases have quietly increased in number. In 1990-2017, stroke had the highest increase rate, followed by ischemic heart disease and diabetes<sup>[28]</sup>. The prevalence rate of cardiovascular disease (2005) and diabetes (2002) in China both exceeded the global average, and stroke is always higher than the global average. After it is recognized that lack of physical activity has become an independent risk factor for many chronic diseases, the awareness of fitness among Chinese residents has increased significantly. The fitness industry continues to prosper, and there is an increasing demand for weight loss, lowering blood lipids, and functional recovery of stroke patients. At this time, with medical ethics, Nirvana Fitness instructed members to make overall improvements from life to diet and even exercise, thus opening the modern ‘combination of sports and medicine’; Shentong Fitness conducts health evaluations for healthy and sub-healthy people. Using exercise as a means and based on medical theories, it adopts specific fitness methods to help members strengthen their

bodies, develop health care and rehabilitation, and facilitate body shaping, thereby improving their health and enabling the development of ‘combination of physical and medical’; Wuzhou Fitness Club gathers experts in the fields of sports, nutrition, and medical treatment to improve the standardized and specialized process of ‘Combination of Sports and Medicine’, thus opening a new beginning for ‘Combination of Sports and Medicine’. These positive attempts in the fitness industry actively respond to the health needs of the people and accelerate the ‘combination of sports and medicine’<sup>[29,30]</sup>.

In addition, many sports scientific research institutions, sports hospitals, national fitness monitoring centers, fitness institutions, Chinese medicine hospitals, and community health service centers are actively making explorations, looking for opportunities to cooperate with medical/sports institutions, thereby contributing positive forces to the acceleration in combination of sports and medicine.

2.2.3 The construction of a healthy China will help transform combination of sports and medicine to integration of sports and medicine

The ‘Healthy China 2030’ planning outline puts forward the strategic theme of ‘sharing and co-construction, health for all’, emphasizes the need to strengthen ‘integration of sports and medicine and non-medical health intervention’, upgrade the exercise prescription library for different groups of people, and vigorously develop the health industry. This strategy gives a new era mission to ‘integration of sports and medical’, emphasizing that development in mutual penetration and integration is needed for sports and medicine so that we can jointly respond to people's health problems, and promote the transformation of disease ‘treatment’ to ‘prevention’. The sports industry is a vital part of the health industry. The integration of the two industries will help promote the development of ‘integration of sports and medicine’ and alleviate the contradiction between health demand and medical supply caused by the continuously rising chronic diseases. The integration of medicine and sports is urgently needed in this regard.

Therefore, the ‘Healthy China 2030’ planning outline is promulgated to ensure health services for people throughout the life cycle and boost the evolution from ‘combination of sports and medicine’ to ‘integration of sports and medicine’. In October 2020, the Fifth Plenary Session of the 19th Central Committee of the Communist Party of China reviewed and approved the ‘Fourteenth Five-Year Plan for the National Economic and Social Development of the People's Republic of China and the Outline of 2035 Long-range Objectives’, which changes ‘integration of sports and medicine’ to ‘integration of sports and health work.’

### III. REALISTIC DILEMMA IN THE EVOLUTION OF ‘INTEGRATION OF SPORTS AND MEDICINE’

#### 3.1 Low Integration of Sports and Medicine

Degree of integration refers to the degree to which different things are integrated together. The degree of integration cannot be directly measured. The degree of integration between things is usually reflected through rough description of the integration phenomenon. At present, although sports and medicine are partially integrated in the fields of competitive sports, mass sports, and disease prevention through technology, talent training, and resources, the overall integration is still low. Its main manifestations are as follows:

1) Limited technological integration. In the field of sports, medical technology is adopted in treatment and rehabilitation of sports injuries and monitoring of physiological and biochemical indicators. In the medical field, the mature exercise therapy in sports is used for recovery of muscle and joint function after the exercise system operation, the rehabilitation of limb function in patients with stroke, and the improvement of heart function in patients with heart disease. However, exercise interventions for chronic diseases, such as diabetes, high blood pressure, and hyperlipidemia that plague the nation as the main health problems, are rarely carried out in the medical field, and the technical integration of the two is limited.

2) Insufficient integration of talent training. Only a few medical colleges such as Anhui Medical University, Wannan Medical College, Xinxiang Medical University offer ‘Sports Prescription’ and other sports-medicine integration courses<sup>[31]</sup>. Though many sports colleges such as Nanjing Sport Institute, Xi'an Physical Education University, Chengdu Sport University, etc. offer courses such as Internal Medicine, Diagnostics, and Exercise Therapy for Chronic Diseases in major of human movement science and sports rehabilitation majors<sup>[32]</sup>, the number of sports schools in China and the number of enrollments in the above-mentioned majors are limited. The proportion of courses such as sports prescription, sports health care is too low in medical schools, which restricts the integration of sports and medicine in talent training.

3) The integration of resources is not broad. Beijing, Shanghai, Changzhou use existing national physical health monitoring stations, stadiums, community health service centers to integrate resources, establish institutions like community health guidance centers, exercise prescription clinics, sports hospitals to carry out integration of sports and medicine for residents<sup>[10]</sup>. However, cities other than provincial capitals in underdeveloped areas, especially the villages or townships in the great agricultural country rarely carry out the integration of sports and medicine, which shows that the integration of sports and medicine resources is not broad enough in China.

China's sports and medical services have not formed a large-scale and universal integration, and the degree of integration between the two is still low. The main reasons are as follows:

1) The limited integration of physical and medical technology is mainly manifested in the limited integration of sports field technology with medicine. This concerns the facts that evidence-based medical technology is easy to be accepted in the sports field, while the accumulated experience in sports has not been widely popularized. The medical field has insufficient mastery and understanding of the technology that has been effectively proven in the sports field.

2) China is in the initial stage of the integration of sports and medicine. The existing teachers of sports and medicine integration are insufficient, and there is a lack of sports prescribers and other occupations related to the integration of sports and medicine in the classification of occupational codes, which hinders the cultivation of compound talents in sports and medicine.

3) The inadequate integration of physical and medical resources mainly concerns factors such as uneven regional development, imperfect systems and mechanisms, and lack of propagable models for the integration of physical and medical resources in China.

### 3.2 The Unequal Social Status of Sports and Medicine

In domestic health services, sports and medicine are in an unbalanced state of 'strong medicine and weak sports' and 'emphasis of medicine over sports'. The specific manifestations are as follows:

1) Medical services are the mainstay of the health industry. 95% of domestic health industry is engaged in medical services, medicines and equipment, while nutrition and fitness are relatively rare<sup>[33]</sup>. Medicine has become the main body of health services, while sports health services are at a disadvantage.

2) Society has prejudices against sports. Confucian theory and political philosophy even refer to sports as 'insignificant stunt', and believe that sports are mainly to 'compete for gold and silver and win glory for the country'.

Common people use sports only as a tool for relaxation, leisure and entertainment, and interpersonal communication, failing to upgrade it into disease prevention, and even treatment and rehabilitation. The main reasons are as follows:

1) Differences in characteristics between medicine and sports. With its unique advantages of quick effect, short cycle, and high profit, medical treatment occupies a leading position in health management. The health promotion effect of sports is slow, with long cycle and low efficiency, which puts it at a disadvantage. In addition, Chinese residents have relatively low health literacy and physical literacy, with relatively weak concept of disease prevention and rehabilitation, which adds to strength of medical treatment.

2) The traditional concept produces restriction effect. Since the Han Dynasty, domestic thinking of ‘putting mental pursuits above martial arts’, ‘valuing civil officer and restraining military officer’, and that ‘a good scholar will make an official’ has profoundly affected China's educational thinking<sup>[33]</sup>. Medical treatment is subordinate to mental pursuits, while sports is subordinate to martial arts. The traditional concept makes people believe in the positive effects of medical treatment on health, while there is low recognition towards the health promotion effect.

### 3.3 Lack of Sports-Medicine Integration Service Model with Chinese Characteristics

Domestic sports-medicine integration service model mainly includes: sports club model, community fitness testing center model, hospital health guidance center model, and government-market combination model<sup>[34]</sup>. In addition, there are also models such as four-party cooperation between ‘Sports-Medicine Integration Research Center-Grade A Class Three Hospitals-Community Hospitals-Fitness Guidance Center’, sports bureau-hospital cooperation, university-hospital, national fitness testing center-hospital physical examination department, etc.<sup>[12]</sup>. At present, domestic sports-medicine integration has best development in Jiangsu Province, which has established more than 100 individual fitness testing and sports fitness guidance stations. Many hospitals have added sports rehabilitation departments, and established a relatively successful platform—Changzhou Sports Hospital to carry out cooperation with multiple community health service centers. Exercise prescription outpatient clinics are set up to provide targeted free or low-cost services to people with chronic diseases such as obesity, diabetes, and hyperlipidemia.

In China, the current sports-medicine integration model does not form an integrated interest community of sports and medicine. The more popular model is that hospitals set up exercise prescription outpatient model. However, venues and personnel for exercise guidance are limited, and part of the patients are diverted to sports institutions, hospital income is thus indirectly reduced. As a result, exercise prescription outpatient clinics have short operation duration and few admissions. In addition, sports guidance has significantly lower income than medical care. Driven by economic interests, it is difficult to promote the sports-medicine integration service model and it relies mainly on government support. The aforementioned models of sports-medicine integration in China have the following dilemmas:

1) Fixed content and form have not been formed, the long-term effects of different models have yet to be tested, and the models that can be widely promoted have not yet been determined.

2) The domestic sports-medicine integration model has relatively low standardization, institutionalization, and localization<sup>[35]</sup>. It mainly draws on models from the United States and the United Kingdom, ignoring the role of traditional sports and traditional Chinese medicine in health promotion, and lacking sports-medicine integration service model with Chinese characteristics.

The main reasons for the above dilemma are as follows: 1) The integration of sports and medicine is in its infancy. Since China started the integration of sports and medicine in 2016, many work including sports-medicine integration service models are in the exploratory period. The two departments of sports and medicine have been pursuing their own policies for a long time, while the integration of sports and medicine requires constant adjustment between the two departments to open up the borders for joint cooperation. Localities and cities have exploratively and tentatively developed integration models based on local conditions. However, given that many models are restricted by factors such as no fixed organization, intermittent operation, and insufficient funding, the implementation effect cannot be evaluated, and no researchers have reported relevant reports. Therefore, China is still unable to introduce propagable sports-medicine integration service model.

2) Western medicine has brought a huge impact to Chinese medicine with its advantages of accuracy, standardization, and quantification, while modern sports criticize traditional Chinese sports characterized by ‘performance and entertainment’ with its ‘higher, faster, stronger’ competitiveness and transcendence. At the same time, with the continuous invasion of Western culture, developing countries tend to accept the successful experiences of developed countries. Our community sports-medicine integration model mainly draws on Western countries, medical intervention is dominated by western medicine, and sports intervention is mainly achieved through modern items such as running and aerobics, which lacks the Chinese characteristics of integrating traditional Chinese medicine and traditional sports.

### 3.4 High Barriers to Employment for Sports-Medicine Integration Compound Talents

Medical colleges or sports colleges are reforming the training of sports-medicine integration compound talents. Some colleges and universities have planned to revise their curriculum training programs. For instance, Wuhan Sports University, Beijing Sports University, Chengdu Sports University and many other sports colleges train sports rehabilitation professionals. Nonetheless, there is a real dilemma of high employment thresholds for the sports-medicine integration compound talents. The main manifestations are as follows: most of the human movement science majors and sports rehabilitation professional compound talents cultivated by sports colleges and universities without medical background

as well as talents in the sports field with the qualifications of exercise prescribers cannot find employment in medical institutions.

The main reasons for this dilemma are as follows: sports rehabilitation and sports therapist qualification examinations in many provinces require a medical background or work experience. These clauses restrict the employment of sports-medicine compound talents cultivated by sports colleges. These personnel cannot participate in qualification certification, so it is impossible for them to find employment in the medical institutions though they lack talents in this field. Moreover, medical students trained in the medical field lack sports instruction skills, which makes it impossible to transfer scientific fitness knowledge and skills from medical institutions to patients or high-risk groups, thus hindering the integration of sports and medicine. In addition, since 2017, the state has trained more than 2,000 exercise prescribers. However, due to the absence of such occupation in the occupational code, such people have become ‘unqualified’. In particular, unemployed student groups are unable to engage in the industry in this field, which indirectly raises the threshold to employment.

#### **IV. ACCELERATE THE EVOLUTION OF THE ‘INTEGRATION OF SPORTS AND MEDICINE’**

##### **4.1 Extensively Implement the ‘Sports-Medicine Integration’ Policy to Enhance the Sports-Medicine Integration Degree**

Since the founding of New China, we have promulgated a number of policies to promote health through sports. In 1954, the ‘Interim Regulations and Project Standards for the Preparatory Work and National Sports System’ were issued; in 1995, the ‘Outline of the National Fitness Program’, ‘Outline of Sports Industry Development’, and ‘Sports Law of the People's Republic of China’ were issued, which laid the foundation for raising the national health level through the important starting point of sports.

In October 2014, Premier Li Keqiang proposed to ‘promote the integrated development of sports fitness, medical care, culture, etc.’; on January 13, 2016, the State Council included ‘Sports Prevention and Intervention Technologies for Chronic Diseases’ in the ‘High-tech Fields Supported by the State’, thus opening the door for ‘the integration of sports and medicine’. Subsequently, ‘Several Opinions on Accelerating the Development of the Sports Industry and Promoting Sports Consumption’ (2014), ‘The 13th Five-Year Plan for the Development of the Sports Industry’ (2016), ‘Healthy China 2030’ Planning Outline’ (2016), ‘Guiding Opinions on Strengthening Health Promotion and Education’ (2016), ‘China’s Mid- and Long-term Plan for Prevention and Control of Chronic Diseases’ (2017), ‘National Nutrition Plan (2017-2030)’ (2017) and other related policies have been continuously launched. Coincidentally, they emphasize ‘strengthening the integration of sports and medicine as well as non-medical health intervention’ to give play to the active role of sports intervention in the prevention and control of chronic diseases.

The above policy escorts the ‘integration of sports and medicine’. In the process of building a ‘healthy Jiangsu’, Jiangsu Province actively explores national physique database integrating sports and medicine, the training of sports-medicine integration compound talents, the construction of sports-medicine integration service points, and the formulation of sports prescription norms and standards. By carrying out ‘sports-medicine integration’ practice, it has become a demonstration for the implementation of our ‘sports-medicine integration’ policy. In the past five years, other provinces and cities across the country have successively carried out practical explorations. In December 2016, the Longhua Hospital Shanghai University of Traditional Chinese Medicine and the Shanghai Research Institute of Sports Science established the ‘Sports Rehabilitation Clinic’. In June 2017, the Institute of Sports Medicine of the General Administration of Sport of China established the ‘Sports Prescription Clinic and Spine Health Clinic’.

In March 2019, Shenzhen organized the city’s physical education teachers to participate in sports medicine-related training. Shenzhen Youth Spine Health Center cooperated with 11 municipal fitness measurement and exercise guidance stations. Yantian District People’s Hospital, Shenzhen established the ‘Heart Rehabilitation Home’. In May 2019, Wuhan Jianyoutang Traditional Chinese Medicine Health Management Center became the first TCM health management and sports rehabilitation center integrating ‘sports and medicine’. In November 2019, Qingdao City established a sports-medicine integration expert advisory committee to develop Qingdao City’s ‘exercise prescription’ promotion manual and boost the implementation of sports–medicine integration. In early 2019, the Diabetes Health Management Clinic of the Endocrinology Department of Beijing Hospital was opened, and a number of community health service centers carried out practice of integrating sports and medicine.

In March 2020, five rehabilitation training centers in Yunnan Province launched the ‘integration of sports and medicine’ for drug treatment. In June 2020, Anhui Province carried out a pilot program of deepening the integration of sports and medicine in Luyang District, Feixi County of Hefei City, Jieshou City, and Yijiang District of Wuhu City. In June 2020, Xiamen City Sports Bureau and Xiamen Municipal Health Commission jointly promoted the first batch of pilot work organized by the Municipal Social Sports Development Center, Physical Education Institute of JiMei University, Yundang Sub-district Community Health Service Center, and Yuxiu Community.

In January 2021, First Affiliated Hospital of Kunming Medical University established the ‘Sports-Medicine Integration Center and Sports Prescription Clinic’. It can be seen that many domestic provinces and cities have carried out the work of integrating sports and medicine. However, except a few areas and individual medical institutions that include ‘physical fitness testing’ and ‘exercise prescriptions’ as charging items, most entities still have no legal charging standards. Many sports scientific research institutions or physical fitness testing centers implement free-of-charge model, which

limits sustainable development of ‘sports-medicine integration’. Therefore, on the one hand, the ‘sports-medicine integration’ policy needs to be widely implemented. In our large agricultural country, ‘sports-medicine integration’ should be actively popularized to rural areas, township health centers, but currently the project mainly targets at community health service centers, scientific research institutions or hospitals in developed cities. On the other hand, the relevant supporting guarantee system for the implementation of ‘sports-medicine integration’ should be perfected by, for instance, setting up charging standards and including sports prescribers in the occupational code. The implementation of these policies will help to improve the symbiosis environment of sports and medical policies, add the symbiotic friction between the two, and thereby deepen the integration of sports and medicine.

#### 4.2 Break away Parochial Prejudice Against Sports and Medicine, and Form an Equal Position

School sports is subordinate to education, while mass sports and competitive sports are under the management of the sports department, and medicine is under the management of the health department. The integration of sports and medicine here includes not only school sports, but also mass sports and competitive sports. School sports is always at a disadvantage in education. The status of mass sports in sports is increasing day by day, while competitive sports is in an advantageous position. However, compared with medicine, sports has a relatively low status while medicine has a higher status. Deng Yaping’s appointment as a professor at the China University of Political Science and Law was controversial, who was ridiculed by saying ‘Is your law taught by a physical education teacher?’. Hefei ‘forced door opening incident’ was broadcasted by the Qingdao TV station as ‘If it is a physical education teacher, it will not raise eyebrows’, openly mocking physical education teachers. Students and parents jointly accuse physical education teachers’ role as class teachers. These living examples fully reflect sad situations where physical education teachers are discriminated, sports people are described to have ‘simple mind, well-developed limbs’, and sports are not recognized by the world. Affected by traditional cultural concepts, the society’s prejudice towards sports and the anomie of individual sports players result in deeply ingrained Chinese concept of ‘emphasizing medicine over sports’. Such parochial prejudice cannot effectively give play to the role of sports in promoting health. Therefore, actively taking effective ways to break away parochial prejudice against sports is the key to promoting the integration of sports and medicine.

Specific measures are as follows: 1) Strengthen public opinion propaganda in the mass media. Actively publicize the effects of sports on disease prevention and treatment through radio, television, Internet and other media, publicize that disease prevention is more important than treatment, publicize scientific sports methods, and renew people's understanding of sports.

2) Increase medical initiative. The key to the integration of sports and medicine lies in the acceptance of sports by medicine. It is recommended that the public health and clinical medicine majors of medical

schools add related courses such as ‘Sports and Health Promotion’ and ‘Sports Prescription’ to improve medical students' awareness of sports. Also, relevant courses can be appropriately added in continuing education and training to increase the recognition of sports by medical workers. Then, by letting doctors recommend physical exercises to patients in need, it will facilitate people’s acceptance and implementation.

3) Deepen scientific research on promoting health through sports. Researchers in the fields of sports medicine and human movement science should actively explore the mechanism of disease prevention and treatment by sports, formulate exercise prescriptions suitable for different populations and diseases, accumulate scientific research data, enrich the evidence that sports improve health, strengthen hard power of sports, and increase the attractiveness of medical treatment.

4) Hospitals can establish affiliated fitness club or add sports rehabilitation room. Existing fitness institutions or centers can actively establish cooperative relations with hospitals, so that doctors issue exercise prescriptions, affiliated fitness clubs execute exercise prescriptions. Resident doctors can be sent to track and monitor exercise to ensure exercise safety and reduce exercise risks for people with diseases. If the hospital conditions permit, it is also possible to add a sports rehabilitation room, introduce physical fitness training, fitness coaches, sports rehabilitation professionals, break the boundary between sports and medical care, break away parochial prejudice against sports and medicine, and promote the formation of a symmetrical and mutually beneficial symbiotic relationship between sports and medicine so that the two ‘are integrated’ together.

#### 4.3 Explore the Sports-Medicine Integration Service Model with Chinese Characteristics to Form a Community of Interests in Sports and Medicine

Comprehensively evaluate the operation of the sports-medicine integration model in various provinces and cities from the aspects of structure, process, effect, etc. Collect information on the experience satisfaction of participating residents, the number of recipients, disease control rate, and the incidence of comorbidities. Continuously summarize the advantages and disadvantages of the existing models such as sports clubs and community testing centers, hospital health guidance centers, government and market integration, four-party cooperation of ‘sports-medicine integration research center-grade A class 3 hospital-community hospital-fitness guidance center’, sports bureau and hospital cooperation, university + hospital, national fitness testing center + hospital medical examination department to continuously optimize the sports-medicine integration model, find a fixed model suitable for our national conditions, widely promote the application, and expand the beneficiaries. According to the characteristics of different cities and villages, the unique model of ‘sports-medicine integration’ can also be formed in different regions, which will be carried out as basic work for a long time. Special attention should be paid to the integration of our traditional sports and Chinese medicine to build a

sports-medicine integration model with Chinese characteristics, give play to the active role of traditional sports and traditional Chinese medicine in disease prevention, treatment and rehabilitation, and promote traditional Chinese culture. In addition, sports colleges and medical colleges can be incorporated into the main body of the sports-medicine integration model to fully motivate the enthusiasm of teachers and students, and build a sports-medicine integration model involving four or more subjects such as ‘hospital + college + community + enterprise’.

The results and experience of developed countries have shown that Japan’s ‘hospital-affiliated fitness club’ model for integration of sports and medicine can better integrate medical treatment and sports to form a community of interests. It is recommended that developed cities such as Beijing, Shanghai, Shenzhen, and Guangzhou can try this operating model. In second-tier cities or non-provincial capital cities where the number of fitness clubs is limited, it is recommended to choose the one that suits you from the numerous sports-medicine integration models and optimize it. Therefore, we can construct a set of evaluation index system for the integration of sports and medicine, evaluate the existing models from different dimensions, summarize respective characteristics and suitable conditions, thereby providing references for the provinces and cities to choose sports-medicine integration models that suit them.

#### 4.4 Adjust the Employment Threshold of Sports-Medicine Compound Talents to Avoid Brain Drain

On the one hand, China lacks sports-medicine compound talents, while on the other hand, the employment threshold is set high, which hinders the sports-medicine compound talents cultivated by sports colleges from finding employment in medical institutions and restricts the integrated development of sports and medicine. It is recommended that the relevant departments appropriately relax the conditions for applying for sports rehabilitation specialists and sports therapists, so that the sports-medicine compound talents cultivated by sports colleges can enter medical institutions to serve people with different diseases. Second, sports colleges and medical colleges should clarify the employment orientation of students majoring in sports and medicine, actively guide the trained students, and encourage students in sports colleges to engage in exercise guidance, injury protection, sports rehabilitation and other disease prevention and recovery work. Medical college students should be encouraged to engage in disease rehabilitation treatment to achieve seamless connection from disease prevention to treatment and rehabilitation.

In addition, it is possible to include sports prescribers in the occupational code to provide legal identities for sports-medicine compound talents, thereby optimizing the symbiosis of sports and medical care, and prescribing personalized exercise guidance programs for chronic diseases and high-risk groups that require sports intervention.

## V. CONCLUSION

Through the ancient Chinese medicine theory exploration and the active practice of famous doctors, the relationship between sports and medicine developed the embryonic form of the early ‘combination of sports and medicine’ at the end of the Eastern Han Dynasty. In 2002, the 16th National Congress of the Communist Party of China included the National Fitness in its work report for the first time, officially opening the modern ‘combination of sports and medicine’. In 2004, the fitness industry actively promoted the continuous development of ‘combination of sports and medicine’. In 2009, The State Council promulgated the ‘Regulations on National Fitness’, which further institutionalized and standardized national fitness. In 2016, Healthy China was promoted as a national strategy, which accelerated the evolution from ‘combination of sports and medicine’ to ‘integration of sports and medicine’. In 2021, the ‘Fourteenth Five-Year Plan for the National Economic and Social Development of the People's Republic of China and the Outline of 2035 Long-Range Objective’ put forward the ‘integration of sports and medicine’, which raises higher requirements for the in-depth integration of sports and medicine.

China, however, is currently facing the real dilemma of low integration of sports and medicine, unequal social status of sports and medicine, lack of a sports-medicine integration service model with Chinese characteristics, and high employment thresholds for compound talents. By extensively implementing the ‘sports-medicine integration’ policy, breaking away parochial prejudice against sports and medicine, exploring ways to integrate sports and medicine with Chinese characteristics, adjusting the employment threshold for sports-medicine compound talents, it is possible to optimize the symbiosis environment of sports and medicine, improve the symbiosis interface, and promote the integration and symbiosis of sports and medicine in China, thereby achieving deeper and wider integration to better jointly serve human health.

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## REFERENCE

- [1] Li R, Qu S, Zhang P, et al. (2015) ‘Economic Evaluation of Combined Diet and Physical Activity Promotion Programs to Prevent Type 2 Diabetes Among Persons at Increased Risk: A Systematic Review for the Community Preventive Services Task Force’, *Ann Intern Med*, 163 (6): 452.
- [2] Uusitupa M, Peltonen M, Lindström J, et al. (2009) ‘Ten year mortality and cardiovascular morbidity in the Finnish Diabetes Prevention Study--secondary analysis of the randomized trial’, *PLoS One* 4, . May 21; 4(5):

e5656.

- [3] Wang S B (1998) 'Talking about Huatuo's combination of sports and medicine', *Sports Culture and History*, (5): 55-56+44.
- [4] PEDERSEN B K, SALTIN B. (2015) 'Exercise as medicine—evidence for prescribing exercise as therapy in 26 different chronic diseases', *Scand Med Sci Sports*, (4): 186-201.
- [5] Zhu L, Wang Z Z, Zhu W M (2020) 'Construction of exercise prescription database in the perspective of healthy China', *Sports Science*, 40(1): 4-15.
- [6] Zeng J E, Yang M F (2019) 'Analysis of the relationship between 'integration of sports and medicine' and 'fusion of sports and medicine'', *Journal of Qinghai Normal University (Natural Science Edition)*, 35(1): 95-98.
- [7] Li J Y, Liang C, Gao C, et al. (2019) 'Research on the connotation and path of the integration of sports and medicine: taking exercise prescription clinic as an example', *Sports Science*, 39(7): 23-32.
- [8] Mu Y X, Li J P (2019) 'The predicament and development path of my country's 'sports-medicine integration' development from the perspective of Healthy China', *Collection of abstracts of the 11th National Sports Science Conference*. The 11th National Sports Science Abstract compilation of conference papers. Chinese Society of Sports Science, : 908-909.
- [9] Zhang K, Yang L N, Zhang J X (2017) 'Healthy China: A Preliminary Study of the Model from 'Integration of Sports and Medicine' to 'Integration of Sports and Medicine'', *Fujian Sports Science and Technology*, 36(6): 1-3.
- [10] Chang F, Li G P (2019) 'The reality and ought to be of the symbiotic relationship between sports and medical treatment under the healthy China strategy', *Sports Science*, 39(6): 13-21.
- [11] Qi Y W, Tao C Q (2010) 'Industrial integration from the perspective of symbiosis evolution', *Journal of Xuzhou Institute of Technology (Social Science Edition)*, 25(6): 8-12.
- [12] Zhang J W, Tang W D (2018) 'The contemporary meaning, local practice and promotion ideas of the coordinated development of 'integration of sports and medicine'', *Journal of Capital Institute of Physical Education*, 30(1): 73-77.
- [13] Xiang H Y (2019) *Research on the Path of 'Integration of Sports and Medicine' in the Community for the Elderly* (Shanghai Institute of Sport).
- [14] Huang C H (2010) 'On the 'Integration of Medicine and Sports' Public Health Service Model', *Fujian Forum (Humanities and Social Sciences Edition)*, (S1): 25-27.
- [15] Zhao X L, Li Z J, Wu Z K (2011) 'Constructing an innovative model of 'combination of sports and medicine' sports public services in urban communities', *Sports Science Research*, 32(4): 58-63.
- [16] Liu Q, Zhao Y J, Liu Z L et al. (2017) 'Role and Trend of Sports in Construction of Healthy China (Talk)', *Journal of Chengdu University of Physical Education*, 43(1): 1-7.
- [17] Hu S J (2006) *Social symbiosis* (Shanghai: Fudan University Press) : 1-6.
- [18] Guo J J (2017) 'Discussion on the path of the integration of sports and medicine to promote the health revolution', *Journal of Chronic Diseases*, 18(11): 1189-1192+1197.
- [19] Feng F J (2018) 'Fusion to Symbiosis: Research on the Protection of National Traditional Sports Culture in the New Era', *Journal of Qiannan Normal University for Nationalities*, 38(3): 1-6.
- [20] Yu Q (2016) *An Empirical Study on the Level of Ecological and Economic Integration and Symbiosis in Jiangxi Province* (Jiangxi Normal University).
- [21] Feng Z W, Zhang R L, Han L L, Wang X L (2019) 'Historical experience and enlightenment of the integration

- of traditional martial arts and Chinese medicine’, *Journal of Physical Education*, 26(1): 27-31.
- [22] Zhao M (2013) ‘On the diversified influence of Jianzhen’s eastward crossing on Japanese society during the heyday of the Tang Dynasty’, *Jiannan Literature (Classic Educational Garden)*, (4): 285.
- [23] Yue X D (2012) ‘On the historical stages of the formation and development of traditional Chinese medicine’, *Guangming Traditional Chinese Medicine*, 27(2): 207-210.
- [24] Ni G X, Deng X Q, Xu Y, et al. (2020) ‘Research on the historical advancement and development path of the integration of sports and medicine’, *Journal of Beijing Sport University*, 43(12): 22-34.
- [25] Cai Y Z, Zhang Y M, Li W H (2009) ‘The strategic significance of the promulgation of the ‘National Fitness Regulations’, *Journal of Beijing University of Physical Education*, 32(09): 12-14+18.
- [26] Li J D (2007) ‘The scientific connotation and quintessence of TCM ‘preventive treatment’, *World Journal of Integrated Traditional Chinese and Western Medicine*, (3): 125-126.
- [27] Zhang X D, Cao X Y, Wang P, et al. (2015) ‘The idea of combination of movement and static in orthopedics and traumatology of traditional Chinese medicine’, *Clinical Research of Traditional Chinese Medicine*, 25(7): 37-39.
- [28] Cao X X, Xu C J, Hou Y B, et al. (2020) ‘Epidemic trend and prediction of high-incidence chronic diseases in my country from 1990 to 2025’, *China Chronic Disease Prevention and Control*, 28(1): 14-19.
- [29] Zhao T (2014) *The current situation and countermeasures of the combined fitness mode in China* (Beijing Sport University).
- [30] Zhao X L (2018) ‘The development and response of ‘physical and medical integration’ under the healthy China strategy’, *Boxing and fighting*, 2018(10): 121-122.
- [31] Fu L Y, Yang X L, Ling W J, et al. (2011) ‘The feasibility study of ‘medicine and physical integration’ compound talent training model’, *Journal of Beijing Sport University*, 34(1): 96-99.
- [32] Qian J G, Sun B, Dai J S, et al. (2010) ‘Research on the training and teaching innovation of ‘medical and physical compound’ talents in sports and human sciences—Nanjing Institute of Physical Education’, *Nanjing Institute of Physical Education Journal (Social Science Edition)*, 24(5): 5-8.
- [33] Shi F F (2017) *Research on the Countermeasures for the Development of my country's Health Industry* (Hebei University).
- [34] Xu J, Lin H F (2020) ‘Refusal of Pride and Prejudice: The Phenomenon, Root and Resolution of the Discrimination of Physical Education Teachers’, *Journal of Jilin Institute of Physical Education*, 36(1): 80-83.
- [35] Lu W Y, Wang Z H, Chen P J (2021) ‘Thoughts on deepening the study of the integration of sports and medicine in the context of building a healthy China and a strong sports nation’, *Journal of Shanghai University of Sport*, 45(1): 40-50.