Exploring the Challenges and Opportunities for Integrating Sports and Medicine in China

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Abstract. Guided by the Health China 2030 Action, this research aims to investigate the current state of sports and medicine integration in China. The study utilizes a combination of literature review and questionnaire survey methods to identify key challenges facing sports and medicine integration in China. To address these challenges, the study examines the sports medicine integration in the United States, and the implementation of the “Exercise is Medicine” course in the University of Georgia’s Kinesiology curriculum. Through this examination, the study aims to provide a comprehensive understanding of the challenges and opportunities for integrating sports and medicine in China, with the understanding that sports can serve as a valuable form of medicine. Keywords: Sports, Sports medicine, Health, Health risks, Medical problems.

1 Introduction

Properly planned and managed integration of sports and medicine can effectively promote public health. Research has shown that regular exercise can prevent diseases [1] and enhance an individual’s health status [2]. When coupled with medical treatments, regular exercise can reduce sedentary lifestyles [3], significantly impact many chronic diseases [4, 5], and lead to less depression and anxiety [6]. The “Exercise Is Medicine” (EIM) project, launched in 2007 by the American Medical Association (AMA) and the American College of Sports Medicine (ACSM), was one of the first initiatives to strengthen cooperation between the two fields of sports and medicine, formulate effective collaborative services, and promote multidisciplinary health promotion projects [7]. Since then, many countries have adopted this cooperative model, including China as part of the “Healthy China Initiative” to address the challenges of an aging population, increasing sub-health conditions, and prevalent chronic diseases [8]. The EIM strategy has been implemented worldwide through multi-sectoral cooperation involving community healthcare associations, medical associations, sports associations, university institutions, health departments, and the National Institute of Public Health. Currently, the strategy has transitioned from the infrastructure establishment and

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awareness-building stage to the specific operation stage, which requires many professionals to implement. Given the importance of the EIM strategy to China’s healthy initiative, this study conducts an in-depth literature review to investigate the challenges and opportunities for integrating sports and medicine in China and provides potential solutions through examination of the “Exercise is Medicine” course in the University of Georgia’s Kinesiology curriculum.

2 Background

Since the 1920s, various countries have implemented health promotion initiatives to integrate physical medicine, sports, medical care, and education. These initiatives focus on health policy, health assessment, exercise guidelines, and rehabilitation. Examples include Healthy People 2020, the Stanford Five-City Project, the Minnesota Heart Health Program, Healthy Japan 21-National Health Promotion, the European Physical Activity Strategy 2016-2025, the Australian Physical Activity Guidelines (2014), the Adults 18-64 years old Physical Activity Guidelines, and the Healthy China Lifestyle Action (2017) [9–11]. Countries such as the United States, Australia, and Britain have established a well-established model for integrating sports and medicine, which has been incorporated into the curriculum of colleges and universities [12]. This model connects the scientific understanding of exercise, physical activity, and health to practical applications and equips students with scientifically sound and appropriate techniques [13].

In contrast to Western countries, the disciplines of sports and medicine have traditionally had limited interaction in China [14]. However, with the introduction of the EIM initiative in 2012, there has been a growing recognition of the need for scholars and practitioners with expertise in both fields. Since 2012, Chinese researchers have proposed various methods for integrating sports and medicine from the perspectives of health management [15], teaching philosophy [16], implementation mode [17], student development, and teacher evaluation [18]. The keyword “physical education” saw a significant increase in research between 2015 and 2020, indicating that more educational institutions were recognizing the importance of researching the optimal curriculum and pathways for physical education to implement EIM initiatives effectively.

Despite the progress in research, implementing EIM in public remains a challenge, as research in universities and colleges on EIM has mainly focused on curriculum reform, competitive sports, and exercise recommendations but has not yet been widely implemented for the public. Fortunately, the field of sports and medicine is constantly evolving, and researchers are working to improve the practical use of EIM initiatives. This includes studying different aspects of sports prescription, like the type of exercise, intensity, frequency, while using molecular biology, cell biology, and immunology to address practical issues in the development of sports medicine [19]. In conclusion, the integration of sports and medicine in China is a promising field that could bring significant benefits to public health and well-being.

3 Integration Issues in China

3.1 Classification Confusion

One of the biggest issues in China’s sports medicine field is the lack of clear national guidelines on its classification and where it belongs. China’s Classification and Code of Disciplines assigns sports medicine as a level-three discipline under clinical medicine, suggesting that medical schools should be responsible for developing professionals in this field. However, the Undergraduate Specialty Catalogue of Higher Institutions published by the Ministry of
Education of the People’s Republic of China claims that sports medicine belongs to both the disciplines of physical education and clinical medicine. This classification creates confusion for colleges and universities as they are unsure where to develop sports medicine specialists, who may have different strengths and weaknesses depending on whether they receive education in physical education schools or medical schools. As a result, in contrast to the suggestion by China’s Classification and Code of Disciplines, sports medicine is often taught in sports universities rather than medical schools. This phenomenon occurs because most Chinese medical schools have traditionally placed a stronger emphasis on developing specialists in surgery or internal medicine rather than sports medicine. The lack of clear guidelines on integrating sports medicine into the medical field leads to challenges in developing and training professionals.

Another significant challenge in China’s sports medicine field is the lack of clear guidelines on the appropriate degrees to be awarded to sports medicine students. The Undergraduate Specialty Catalogue of Higher Institutions published by the Academic Degrees Committee of the State Council, which is in charge of managing work related to granting degrees, states that sports medicine students should be granted degrees in education or science instead of medicine. Based on this guideline, it is rare for sports medicine students to graduate with a degree in medicine. As a result, most sports medicine students without a degree in medicine cannot obtain a certificate for doctor’s qualification and are thus not permitted to prescribe sports-related treatment. This restriction poses a significant challenge in the field, as it limits the ability of sports medicine specialists to provide specialized care to athletes and the public, despite their knowledge and expertise.

### 3.2 Lack of Capable Professionals

According to the National Health Commission of the People’s Republic of China, approximately 70% of sub-optimal health conditions in China are caused by unhealthy lifestyles, contributing to 87% of deaths. As of 2014, there were 290 million patients with cardiovascular and cerebrovascular diseases, 114 million patients with diabetes, 270 million with hypertension, over 200 million with blood lipid abnormalities, and more than 200 million with fatty liver and obesity [20]. To address these striking numbers regarding the sub-health conditions in China, the Health China 2030 Action highlights the importance of enhancing the integration of sports and medicine and promoting non-medical health interventions [21]. The document specifically emphasizes the need for sports medicine professionals to specialize in such interventions. However, according to official data from the Chinese Academy of Sports Sciences and the 2019 International Sports Prescription Forum, China has trained just over 2000 sports prescription doctors. This number results in a ratio of one such doctor per 70,000,000 people, which is significantly lower than the global average and inadequate to achieve the goals set by the Health China 2030 Action [22]. In comparison, developed countries in Europe and America have a higher ratio of rehabilitation doctors per 10,000 people, and Japan has a higher ratio of nutritionists per 300 people [23].

Several factors may prevent many sports medicine graduates from gaining the necessary knowledge and expertise to become capable sports prescription doctors.

1. The sports medicine curriculum needs to be updated. The recommended textbook by the People’s Medical Publishing House (PMPH), Sports Medicine, was published in 2012 and may need more recent research findings to prepare students with the most updated knowledge base.

2. While universities and colleges offer practical courses along with theoretical lectures to allow students to apply what they have learned in lectures to a real-world setting, many students do not have the opportunities to get hands-on training in a practical class due to
limited resources such as equipment and on-site guidance. As a result, the sports medicine curriculum primarily emphasizes theoretical instruction with limited time for practical application, and the final assessment tests theoretical knowledge rather than practical skills, which may result in relatively weak practitioners [24].

3. Some Chinese colleges and universities have a weak connection with off-campus institutions, such as local communities and research communities, in terms of collaborating on internship projects to give students more hands-on experience [24].

4. Sports medicine is still a relatively young discipline. No official institution offers a standardized level of education, training, or certification required to become sports physicians, sports rehabilitation therapists, or sports therapists [25]. This lack of a universal standard could lead to a lack of uniformity in practitioners’ expertise and make it harder for professionals to be recognized by professional organizations and to be licensed by regulatory bodies.

### 3.3 Insufficient Job Opportunities

Sports medicine graduates can choose from various job opportunities, including research on human physiology and sports, sports medical supervision, exercise guidance design and exercise prescription, and exercise therapy and clinical rehabilitation. They may work for a range of organizations, such as sports teams, hospitals, sports rehabilitation centers, health management centers, community service organizations, fitness organizations, and schools. However, a recent survey from Chengdu University of Traditional Chinese Medicine found that most sports rehabilitation graduates (52.94%) work in rehabilitation or physical therapy departments of hospitals, with few working in other organizations (table 1).

Further interviews with survey participants revealed that a lack of opportunities in organizations outside hospitals (e.g., community service organizations and sports rehabilitation centers) led to a high percentage of graduates working in hospitals. Fortunately, under the guidance of the Health China 2030 Action, sports and medical care integration is gaining traction in China, with an increasing number of community organizations providing job opportunities for sports medicine graduates. For instance, Shanghai’s Yangpu District launched a “Community Health Coach” program in partnership with the Shanghai Sports Institute [26]. The program aims to provide scientific fitness, health, and rehabilitation advice to the community. Over 2,000 community members have received in-person guidance through this program, which has been well received by the community. As more cities adopt similar programs, it is expected that job opportunities for sports medicine graduates will continue to grow, creating tremendous opportunities for China to integrate sports and medicine successfully.

### 4 Sports Medicine in the United States

This section presents an analysis of the education system and training in sports medicine in the United States, based on the author’s experience as a visiting scholar at the University
of Georgia and a review of official government and institutional documents. The section identifies three key areas that have contributed to the successful integration of sports and medicine in the United States and suggests that these could be implemented in China to improve the training and education of sports medicine professionals.

4.1 A Clear Path to Specialization

According to the Association of American Medical Colleges, sports medicine is a subspecialty of physical medicine and rehabilitation focused on preventing, diagnosing, and treating injuries related to sports and exercise. Physiatrists, who specialize in sports medicine, work to improve the physical performance of their patients and treat illnesses and diseases that may impact them. The education system separates sports medicine instruction between medical schools and kinesiology departments in the United States. Medical schools provide a clinical approach focusing on diagnosing, treating, and managing musculoskeletal injuries. Students in these programs receive surgical and non-surgical intervention training and learn to work closely with other healthcare providers, such as physical therapists and athletic trainers [27].

On the other hand, Kinesiology departments offer a different type of training that focuses on the scientific study of human movement and the prevention of injuries [28]. The education provided in these departments has a less clinical focus. It prepares students for research, a career in the fitness and wellness industry, or clinical practice if they decide to continue their education at medical schools. For example, the University of Georgia’s Kinesiology department offers an exercise science concentration and a BSEd in exercise and sport science. This degree prepares students for a career in sports medicine and related fields by delving into the science of physical activity, exercise, and sport. The program also includes a pre-medicine track with required courses, such as “exercise is medicine”, to prepare students for potential entrance into medical school.

In summary, compared to China which lacks clear national guidelines on the appropriate classification for sports medicine and on the appropriate degrees to be awarded to sports medicine students, the United States has an education system that clearly separates sports instruction between medical schools and kinesiology departments and that leads to a transparent and efficient process of training and education.

4.2 High-quality Education

In addition to providing clear top-down guidelines for training sports medicine students, the United States’ education system also helps to develop qualified sports medicine professionals in research, industry, and clinical practice. This high-quality education can be seen in various aspects, such as comprehensive curriculum development, hands-on teaching methods, up-to-date textbooks, and ample on-campus opportunities for the practical application of knowledge.

For example, the “exercise is medicine” course, which was taught in Fall 2022 at the University of Georgia, aimed to explore the public health guidelines and biological mechanisms related to physical activity and exercise-induced enhancement of physical and mental health. The learning objectives included using knowledge and techniques based on established behavioral science to develop a personal movement and dietary plan, identifying established risk factors for major chronic diseases, and giving examples of conventional research methodologies in exercise and physical activity research. As a hybrid class, students were required to participate in two credit hours of in-class instruction and one credit hour of laboratory activities. After each week’s lecture, students participated in a lab session which allowed them to
immediately apply what they had learned in class to real-world scenarios. Furthermore, the University of Georgia offered various facilities, such as the University Health Center, Ramsey Student Center, and over ten exercise science labs, to provide platforms for students to further apply their theoretical knowledge and gain hands-on experience. Several studies have investigated the benefits of combining practical work with theoretical teaching. For instance, Berger et al. found that combining problem-based learning with high-fidelity simulation is the most effective in teaching cardiopulmonary resuscitation (CPR) to medical students [29]. It is therefore recommended that Chinese universities and colleges also consider incorporating similar hybrid teaching methods in their exercise and physical activity curriculum to improve student understanding and engagement and prepare students for real-world scenarios and future careers in the field.

The “exercise is medicine” class was also well-equipped with various sources of knowledge to help students deepen their understanding of different topics. For example, the textbook used in the class, *Fitness and Wellness: A Way of Life* [30], was published in 2018 and included more recent findings and schools of thought than the textbook used in China, which was published in 2012. In addition, the instructor provided additional reading materials to the course website, including papers highlighting the most recent research findings and classic lab experiments, to help students become more capable researchers. Besides research publications, current public guidelines for exercise/physical activity and nutrition behaviors were given to students, who were required to summarize and fully understand them. By providing students with a variety of sources of knowledge, students can deepen their understanding of different topics.

### 4.3 Various Career Options

Kinesiology departments at universities in the United States offer a variety of concentrations to prepare students for different careers in the sports industry. For example, the kinesiology department at UGA offers four concentrations: athletic training, exercise science, physical education, and sport management. Athletic training focuses on training healthcare providers to promote health and safety, while exercise science prepares students for careers in physical therapy, occupational therapy, and sports medicine. Physical education teaches students how to improve physical fitness and develop teamwork skills to become physical education teachers in Georgia schools, and sport management provides a comprehensive understanding of various areas of sport management and prepares students for careers in sports organizations, corporate businesses, and sponsorships. The diverse concentrations offered by kinesiology departments allow students to choose the area that best aligns with their interests, which generates an interest-major congruence that makes students more likely to persist in their studies and succeed [31].

In the United States, there are four reputable certifying organizations for personal trainers and other fitness professionals: the National Academy of Sports Medicine (NASM), National Strength and Conditioning Association (NSCA), American Council on Exercise (ACE), and American College of Sports Medicine (ACSM). These organizations have different certification processes and requirements, but all are widely recognized in the fitness industry [32]. ACE, for example, is a non-profit organization that offers certifications for personal trainers, group fitness instructors, health coaches, and Medical Exercise Specialists (MES) for healthcare professionals, as well as education and resources for the fitness industry. To develop more qualified professionals in China, it is recommended that similar organizations be established in China that not only offer certifications but also provide education and resources.
In summary, students in the United States can select different professions in the sports industry by choosing from the variety of concentrations offered by kinesiology departments at universities and pursuing different certifications from reputable organizations.

5 Conclusion

In conclusion, while the “EI” initiative in China is evolving, China’s sports medicine field faces several challenges, including classification confusion and a lack of clear guidelines on integrating sports medicine into the medical field. This challenge has led to difficulties in developing and training professionals in this field and confusion over the appropriate degrees to be awarded to sports medicine students. Furthermore, the lack of capable professionals in the field is a significant issue, with only a small number of sports medicine specialists trained in China, far below the global average. This shortage of professionals is a significant obstacle to addressing the high prevalence of sub-optimal health conditions in China, which are largely caused by unhealthy lifestyles. Addressing these challenges will be crucial in achieving the goals set by the Health China 2030 Action, which emphasizes the importance of enhancing the integration of sports and medicine and promoting non-medical health interventions.

In contrast, the United States has an education system that integrates sports and medicine successfully. The key areas contributing to this success include a clear path to specialization, which separates sports medicine instruction between medical schools and kinesiology departments and provides students with tailored programs and the necessary knowledge and skills for their chosen career paths. Additionally, the education system in the US prioritizes high-quality education, which includes comprehensive curriculum development, hands-on teaching methods, and ample opportunities for the practical application of knowledge. These characteristics have led to well-trained and qualified US sports medicine professionals. China can learn from these successful practices in the US to improve the training and education of sports medicine professionals in China and develop a qualified workforce in research, industry, and clinical practice. Furthermore, developing more certifying organizations in China that align with international standards could also enhance the recognition of professionals and their qualifications in sports medicine.

References

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