Available Online: 11 November 2025 DOI: 10.54254/3049-7248/2025.29251

Exploration on the cultivation of graduate and undergraduate medical talents and discipline construction in Yunnan's hot spring medical and health care industry

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Abstract. In response to the Healthy China strategy and the development needs of Yunnan's hot spring medical and health care industry, this paper focuses on the core issues of medical talent cultivation and discipline construction for graduate and undergraduate students. By analyzing the current situation of talent supply and demand, sorting out the logic of discipline and major settings, and interpreting the characteristics of curriculum system construction, it explores the enrollment and employment trends, and clarifies the optimization direction of cultivation and construction. Yunnan has formed a prototype of "government-industry-university-research" collaborative training, but there exists an imbalance in the supply and demand structure: such as the shortage of high-end graduate talents, weak characteristic skills of undergraduates, lack of professional independence, and insufficient connection between courses and the industry; in addition, the current health and wellness tourism industry in Yunnan still faces problems such as a single business format and large investment. This study suggests improving the pertinence and adaptability of medical talent training. By accurately positioning the training goals of graduate students focusing on scientific research training and undergraduates emphasizing practical skills, improving interdisciplinary settings, and deepening university-enterprise integration, a multi-level medical talent training system should be constructed to provide talent support for the high-quality development of Yunnan's hot spring medical and health care industry.

Keywords: hot spring medical and health care, medical talent cultivation, graduate student, undergraduate

1. Introduction

Yunnan boasts over 1,300 hot spring sites, scattered throughout various prefectures and counties, with a wide variety of hot spring types. Coupled with ethnic medical resources such as Dai medicine and Yi medicine, as well as ecological and climatic advantages suitable for aging care, it is one of the provinces in China with the best conditions for the development of hot spring medical and health care industry [1]. As an emerging integrated format of the health industry and the cultural tourism industry, the hot spring medical and health care industry has unique development advantages in Yunnan. However, there are still many problems in the current health and wellness tourism industry ecosystem in Yunnan [2]. Relying on high-quality hot spring resources, regions such as Tengchong have built a number of hot spring rehabilitation and health care demonstration bases,

forming an industrial cluster integrating clinical treatment, health management, and rehabilitation care [3]. Projects such as Tengchong Rehai Scenic Area and Tengchong Volcano and Geothermal National Geopark have created a comprehensive service model integrating tourism, leisure and recuperation, and vacation health preservation by integrating hot spring and geological resources, further highlighting the practical scenario value of Yunnan's hot spring medical and health care industry [4]. From the perspective of market demand, Yunnan's forest health care industry has significant potential. Based on the GM(1,1) model estimation, the number of forest health care tourists reached 92.56755 million person-times and the total tourism income was 32.0803 billion yuan in 2023, and 91.62% of the surveyed respondents had the willingness to consume forest health care, which further highlights the urgent demand for suitable talents [5]. With industrial upgrading, the market's demand for compound talents who not only master medical professional knowledge but also possess hot spring health care technology is increasingly urgent, especially the need for professional and technical talents and management talents at the graduate and undergraduate levels.

Relevant documents of the Ministry of Education clearly propose the need to promote the in-depth integration of medical education and the health industry and cultivate interdisciplinary compound talents. Although Yunnan has carried out talent training through university-enterprise cooperation and order-based training, and universities such as West Yunnan University of Applied Sciences have set up relevant professional directions, the training system at the graduate and undergraduate levels is still in the exploration stage. Kunming has optimized the cultural tourism consumption environment by focusing on the "three carriages" of the supply side, demand side, and management side, which has indirectly promoted the demand for high-quality talents in the hot spring medical and health care industry and provided a dual policy and market orientation for talent training [6]. Based on four dimensions: supply-demand matching, discipline setting, curriculum construction, and enrollment and employment, this study explores the current situation and optimization paths of medical talent training in Yunnan's hot spring medical and health care industry, so as to provide reference for improving the reform of the regional medical education system.

2. Supply and demand analysis of medical talents in Yunnan's hot spring medical and health care industry

2.1. Demand analysis for graduates and undergraduates

2.1.1. Demand at the graduate level

It is mainly concentrated in the field of high-end technology and management. Hot spring health care institutions are in urgent need of talents with scientific research capabilities to carry out clinical research on hot spring therapy. Relevant studies also emphasize cultivating graduates' ability to solve practical problems in the hot spring medical and health care industry through university-enterprise joint scientific research and clinical research projects [7], such as the research on the intervention mechanism of hot springs in chronic diseases such as stroke and hypertension; at the same time, industrial upgrading has spawned a demand for high-end management talents who are required to have both a medical professional background and industrial operation capabilities to coordinate medical services and the development of health care projects. Under the current trend of global carbon market connection, the concept of green development has gradually penetrated into the health care industry, which also requires graduates with interdisciplinary knowledge of environment and health to participate in the low-carbon operation and management of the industry [8].

2.1.2. Demand at the undergraduate level

It is dominated by applied technical talents. Grassroots hot spring health care institutions and health management centers have a strong demand for professional talents in rehabilitation treatment and health management [9], requiring graduates to master practical skills such as hot spring hydrotherapy technology, rehabilitation assessment, and health monitoring. In terms of services, it focuses on three major areas: "rehabilitation treatment practice, elderly care, and health monitoring", and requires both "theoretical + practical" capabilities, as well as adapting to rural and grassroots health care scenarios [10].

2.2. Supply analysis for graduates and undergraduates

2.2.1. Supply at the graduate level

The total amount is insufficient and the training pertinence is weak. At present, universities in Yunnan have not independently set up master's programs related to hot spring medical and health care. Relevant talents are mainly trained relying on disciplines such as Rehabilitation Medicine, Public Health and Preventive Medicine, and Nursing. The training content focuses on general medical knowledge, lacking characteristic modules such as hot spring therapy and health care industry management. A study

analyzing the current situation of graduate training related to rehabilitation nationwide pointed out that among master's students majoring in Rehabilitation Medicine and Physical Therapy, only 12% of the research directions involve interdisciplinary fields such as "hot spring rehabilitation" and "chronic disease health care intervention", and only 5 out of 73 enrolled universities have established joint training mechanisms with local health care enterprises [11].

2.2.2. Supply at the undergraduate level

A preliminary scale has been formed but with insufficient characteristics, and students' practical skills are disconnected from production capacity. Undergraduate colleges focus on theoretical teaching, and the access to enterprise practical resources is insufficient. Relevant research shows that the training scale of undergraduate colleges can only meet 40% of the industry demand, and 70% of graduates need secondary training by enterprises due to "lack of on-the-job practical skills" [12].

3. Discipline and major settings for medical talents in Yunnan's hot spring medical and health care industry

3.1. Discipline and major settings for graduates

At present, Yunnan adopts the setting model of "mainstream disciplines + characteristic directions", and no independent first-level discipline of hot spring medical and health care has been established nationwide. Research directions are mainly set up relying on the following disciplines:

1. Rehabilitation Medicine and Physical Therapy: Represented by Kunming Medical University, it sets up the research direction of hot spring rehabilitation, focusing on the clinical application of hot springs in the fields of chronic pain and sports injuries. The main disciplines include Clinical Medicine, Rehabilitation Medicine, and Sports Medicine.

2. Public Health and Preventive Medicine: Some universities add a hot spring health management module under the health management direction to study the correlation between hot springs and chronic disease prevention and health promotion. The main disciplines include Preventive Medicine, Management, and Epidemiology.

3. Joint Training Programs: Through the "university + research institution" model, such as the cooperation between Yunnan Plateau Hot Spring Health Care Industry Innovation Research Institute and Wenzhou Medical University, joint training is carried out under disciplines such as Medical Technology and Public Administration, focusing on the combination of scientific research and industrial practice. In 2023, it co-hosted the "Hot Spring Medical and Health Care Industry Development Forum" to promote the transformation of achievements.

3.2. Discipline and major settings for undergraduates

Following the principle of "relying on existing majors and adding characteristic directions", two types of professional directions are mainly set up and the connection with industrial demand is strengthened:

1. Rehabilitation Therapy (Hot Spring Rehabilitation Direction): It is mainly based on the discipline of Rehabilitation Medicine, integrating characteristic content of hot spring therapy, to cultivate applied talents who master sports rehabilitation technology and hot spring hydrotherapy skills. The main disciplines include Basic Medical Science, Rehabilitation Medicine, and Introduction to Hot Spring Medicine.

2. Health Service and Management (Hot Spring Health Care Direction): Based on the discipline of Public Administration, it integrates knowledge of medicine, marketing, and tourism management to cultivate talents in health management and health care project operation. The main disciplines include Introduction to Clinical Medicine, Management, and Health Education.

3. Strengthening the connection with industrial demand: Some universities integrate hot spring health care elements into majors such as Geriatrics and Health, and Health and Medical Security with reference to the guiding professional standards of the Ministry of Education.

4. Curriculum settings for medical talents in Yunnan's hot spring medical and health care industry

4.1. Compulsory and elective course settings for graduates

1. Compulsory Courses: Focus on subject-based basic courses, including public compulsory courses and professional basic courses. Public compulsory courses cover political theory and professional foreign languages, accounting for about 7 credits; professional basic courses are set according to disciplinary directions, such as Advanced Rehabilitation Physiology and Clinical Rehabilitation Assessment for the Rehabilitation Medicine direction, and Progress in Health Management and Epidemiological Research Methods for the Public Health direction, with a total credit requirement of not less than 15 credits.

2. Elective Courses: Highlight characteristics and interdisciplinarity, and set up core curriculum modules for hot spring medical and health care, including Introduction to Hot Spring Medicine, Clinical Research on Hot Spring Therapy, Policies and Management of the Health Care Industry, and Hot Spring Intervention Technology for Chronic Diseases. Each course is 1-2 credits. At the same time, non-degree courses such as academic activities and teaching practice are offered to deepen theoretical knowledge in practice.

4.2. Compulsory and elective course settings for undergraduates

1. Compulsory Courses: Divided into three categories: general education courses, professional basic courses, and core courses. General education courses include College English and Computer Basics; professional basic courses cover Introduction to Basic Medicine, Introduction to Clinical Medicine, and Basic Rehabilitation Medicine; core courses are set according to professional directions, such as Sports Therapy Technology, Occupational Therapy, and Physical Factor Therapy for the Rehabilitation Therapy direction, and Health Assessment and Health Intervention Technology for the Health Management direction.

2. Elective Courses: Focus on practical skills and regional characteristics, and set up a group of characteristic hot spring health care courses, including Hot Spring Hydrotherapy Technology, Practice of Combining Traditional Chinese Medicine Health Preservation with Hot Springs, Operation and Management of Health Care Institutions, and Health Big Data Analysis; at the same time, international courses such as International Health Care Standards are offered for students to choose.

5. Enrollment and employment analysis of medical talents in Yunnan's hot spring medical and health care industry

5.1. Enrollment analysis for graduates and undergraduates

1. Graduate Enrollment: Mainly combines recommended admission and unified examination, with a small enrollment scale. Kunming Medical University enrolls about 10 graduate students in relevant directions in the Rehabilitation Medicine discipline every year. Some joint training programs adopt a "double-tutor system" of "university tutor + enterprise tutor", and enrollment requires an enterprise interview, focusing on selecting candidates with practical experience. Referring to the training model of Jinzhou Medical University, some universities formulate personalized training plans within 3 months of enrollment, incorporating hot spring health care research content.

2. Undergraduate Enrollment: Mainly based on the national college entrance examination unified recruitment, and some adopt order-based enrollment. The Sports Rehabilitation major (hot spring direction) of West Yunnan University of Applied Sciences enrolls about 50 students every year, with the admission score line 10-15 points higher than that of similar majors in the province. Yunnan Medical and Health Vocational College carries out order-based training in cooperation with Donghu Hot Spring and Hengyi Group. The employment rate of graduates in the 2024 session reached 98.2%, leading medical colleges and universities in the province for 5 consecutive years.

5.2. Employment analysis for graduates and undergraduates

1. Graduate Employment: Mainly in high-end positions. The main employment directions include three categories: first, scientific research institutions, such as Yunnan Plateau Hot Spring Health Care Industry Innovation Research Institute, engaged in hot spring medical research; second, high-end health care institutions, serving as technical supervisors or operation directors, responsible for clinical technical guidance and project management; third, institutions of higher learning, engaged in teaching and scientific research work.

2. Undergraduate Employment: Mainly in applied positions, with a high degree of supply-demand matching. Most graduates join relevant units such as hot spring health care institutions and rehabilitation hospitals, engaged in rehabilitation treatment and health management work; a certain proportion of graduates enter grassroots medical institutions to carry out community hot spring health care services; some also enter the health sector of enterprises such as Yunnan Baiyao. The internship retention rate of training bases such as Donghu Hot Spring Rehabilitation Medical Center reached 62%, which has obvious advantages compared with other medical majors in the province.

6. Conclusion

The cultivation of medical talents in Yunnan's hot spring medical and health care industry has initially formed a "government-industry-university-research" collaborative pattern. Through measures such as optimizing disciplinary directions, strengthening curriculum characteristics, and deepening university-enterprise cooperation, a training system connecting graduate and undergraduate levels has been gradually constructed. However, there are still three prominent problems: first, the imbalance in

supply and demand structure, insufficient supply of high-end graduate talents, and the need to strengthen the cultivation of characteristic skills of undergraduates; second, the lack of independence of disciplines and majors, and the failure to form a characteristic disciplinary system; third, the insufficient combination of courses and the industry, and the need to integrate practical teaching resources.

It is suggested that future efforts should be made to promote and optimize from three aspects: first, accurately position training goals, focus on scientific research and management capabilities for graduates, strengthen practical skills for undergraduates, and build a differentiated training system; second, improve the setting of disciplines and majors, promote the establishment of interdisciplinary disciplines of hot spring medical and health care, and optimize professional connotations with reference to the guiding professional standards of the Ministry of Education; third, deepen university-enterprise integration, expand the coverage of training bases, implement the "double-tutor system" and order-based training, and realize the seamless connection between talent training and industrial demand. Through the above paths and implementation methods, more compound medical talents suitable for the development of Yunnan's hot spring medical and health care industry can be cultivated, providing strong support for regional industrial upgrading and the construction of Healthy Yunnan.

Fund projects

Supported by the Humanities and Social Sciences Research Fund Project related to Great Health of Kunming Medical University (DJK2024109), the Special Project for the Research on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era (KYGWDJYJ2408), and the Special Fund Project for Nursing of Kunming Medical University (2025KYHLZXZK27).

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