

A Comparative Study of General Practitioner Training and Service Models in China and the U.S. Based on Literature Review

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Abstract:

s. In the context of changes in the global healthcare system in the 21st century, the importance of general medicine has become increasingly prominent. This study aims to provide valuable references for the future development of the field of general medicine by comparing the differences and characteristics of the training and service models of general practitioners between China and the United States, to promote the construction of a hierarchical diagnosis and treatment system in China. By reviewing extensive relevant literature, this study found significant differences between China and the United States in the training cycle, curriculum, assessment and certification, and job functions of general practitioners. The main conclusions include: that the general medicine education system and the hierarchical diagnosis and treatment system in the United States are rigorous and mature, with the key role of general practitioners being strengthened in multiple ways; although China's general medicine education has been developing rapidly, issues such as an imperfect training system, weak faculty, and insufficient social cognition and attention remain. It is recommended that the curriculum of Chinese general medicine education be optimized, faculty development strengthened, opportunities for clinical practice increased, and social recognition and remuneration of general practitioners be enhanced to promote the robust development of general medicine.

Keywords: General Practitioners; Training Model; Comparative Study; China and the United States.

1. Introduction

In the global healthcare system of the 21st century, the healthcare model is undergoing profound changes due to the accelerated aging of the population and the increasing burden of chronic non-communicable diseases. General medicine, as the cornerstone of primary health care, is playing an increasingly important role in the modern healthcare system with its continuity of care, prevention-oriented health management approach, and unique advantage of integrating medical resources. General practitioners are those who have received specialized training in general medicine and have mastered multidisciplinary knowledge in basic medicine, clinical medicine, preventive medicine, rehabilitation medicine, and other disciplines. As highly integrated medical professionals, they are responsible for preventive health care, diagnosis and treatment of common ailments, referrals, patient rehabilitation, chronic illness management, and comprehensive health management.

The graded diagnosis and treatment system categorizes diseases according to their severity, urgency, and treatability, assigning medical institutions at different levels to manage different disease categories. This approach facilitates a pattern of primary care, two-way referrals, emergency treatments, and interconnected healthcare services. The system aims to guide patients to seek medical treatment in an orderly fashion through the scientific and rational allocation of medical resources, alleviating the “difficult access” issue at large hospitals. Simultaneously, it enhances the service capacity and quality of primary medical institutions, thereby promoting balanced development in the medical and healthcare sectors. Within this framework, general practitioners serve as “gatekeepers”, bridging primary care organizations with higher-level hospitals and ensuring that patients receive timely, effective, and continuous medical services. General practitioners bear the critical responsibilities of initial disease screening, health management, and referral guidance, while also promoting the rational allocation of medical resources and improving the efficiency of medical services, which has become a focal point of research in the medical field domestically and internationally[9]. This study aligns with the strategic direction of the national “Opinions on Further Improving the Medical and Health Care Service System,” discussing in depth the core role of general medicine in optimizing resource allocation and strengthening primary care capacity. This endeavor is both prospective and of significant practical importance for enhancing the hierarchical diagnosis and treatment system and improving overall population health.

However, despite the growing importance of general med-

icine, China still faces many challenges in the training and service model of general practitioners. According to statistics, there is a serious shortage of general practitioners in China, making it difficult to meet the growing demand for primary care services. According to the 2023 statistical bulletin of China’s healthcare development, China currently has 3.99 general practitioners per 10,000 population [7]. By the end of 2021, the ratio of general practitioners to specialists was about 1:10, far below the World Health Organization’s recommendation that the ratio of general practitioners to specialists should be at least 1:1 [27]. This status quo not only restricts the in-depth implementation of the hierarchical diagnosis and treatment system, but also affects the fairness and accessibility of medical services. Therefore, how to learn from the international advanced experience, especially the successful practices of developed countries such as the United States in the training and service model of general practitioners, and explore a suitable path for the development of general medicine in China by combining with China’s national conditions has become an urgent problem to be solved at present.

Comparing the positioning of general practitioners in the healthcare systems of China and the United States, there are several commonalities in the roles of general practitioners in both countries: they are the basic link in the healthcare system, responsible for dealing with common health problems, conducting health status assessment, and chronic disease management. In both China and the U.S., general practitioners are responsible for health education, vaccination, and population health management, and through their services, they enhance residents’ health awareness and self-care ability.

However, there are differences between the two countries in terms of the role of general practitioners. In China, general practitioners act as a bridge between primary care organizations and higher-level hospitals and as “gatekeepers” of residents’ health, responsible for primary care and screening and recommending patients for referral in order to reduce the pressure on large hospitals. Although China also has a tiered diagnosis and treatment system, patients have relatively flexible choices, and can choose to go to a primary care organization or a secondary or tertiary hospital based on their own circumstances. In contrast, the U.S. has a more rigorous and mature system of hierarchical diagnosis and treatment. Patients first receive initial assessment, diagnosis and basic treatment from a general practitioner, who decides whether or not to make a referral. In addition, the U.S. reimbursement system further strengthens the central position of general practitioners by stipulating that insurance purchasers need to be seen within the insurance-covered healthcare network, i.e., only

specialty services recommended and referred by general practitioners can be reimbursed, which increases patients' reliance on general practitioners and ensures coordinated and efficient healthcare services [10].

The purpose of this paper is to analyze the differences and commonalities in the development of general medicine between China and the United States by comparing the training mode and service mode of general practitioners in the two countries, and to reveal the problems and deficiencies in the training and service mode of general practitioners in China. At the same time, combined with the important role of general practitioners in hierarchical diagnosis and treatment, targeted policy recommendations are put forward, with a view to providing theoretical support and practical guidance for the rapid development of China's general medicine and the improvement of the hierarchical diagnosis and treatment system.

2. Methods

A systematic literature review was employed to conduct this comparative study of general practitioner training and service models between China and the United States. The research began with an exhaustive search for relevant academic articles, reports, and policy documents. This was achieved through utilizing electronic databases such as PubMed, Google Scholar, CNKI (China National Knowledge Infrastructure), and official websites of healthcare organizations and government agencies in both countries. The search keywords included "general practitioner training," "service model," "China," and "United States," as well as various combinations of these terms. Additionally, manual searches were conducted by referencing relevant textbooks, conference papers, and grey literature to ensure a comprehensive coverage of the topic.

The inclusion criteria for selecting articles and documents were based on their relevance to the study objectives, which focused on comparing the training models and service delivery systems of general practitioners in China and the United States. Only articles and documents published in English or Chinese and from reputable sources such as peer-reviewed journals, government reports, and academic institutions were included.

Once identified, the articles and documents were carefully reviewed and analyzed.

Finally, the similarities and differences between the two countries in terms of general practitioner training and service models were highlighted, and the implications for the future development of general medicine in China were discussed.

3. Comparison of General Practitioner Training Modes between China and the United States

3.1 Comparison of training systems at the school education stage

3.1.1 Specialization and development history

Family medicine education in China started late but has developed rapidly in recent years. The budding of general medical education began in the late 1980s, a period characterized by the introduction and initial exploration of the concept of general medicine. With the deepening of medical reform, general medical education gradually received attention, but it was still in the initial stage, and the training system and mode had not yet been perfected. In October 1989, the former Capital Medical College set up a training center for general practitioners, and general medical education began to be promoted nationwide, but it was mainly focused on the level of institutional education, and the development of post-graduation education and continuing medical education lagged behind. By the mid-to-late 1990s, it had entered the early development stage and gradually established general medicine specialties in medical schools [21]. At present, China's general medicine education has covered the undergraduate, master's and doctoral levels, forming a relatively complete education system. The goal is that by 2030, every 10,000 residents in urban and rural areas will have five qualified general practitioners, and the general practitioner workforce will basically meet the needs of the construction of a healthy China [8].

The training of general practitioners in China is mainly divided into three educational stages: specialty, undergraduate and master's degree. The research and practice of the general medicine personnel training system and training mode of Capital Medical University emphasizes the 3+2 assistant general practitioner training mode, which takes 3-year specialist graduates of clinical medicine as the training target and aims to comprehensively improve the clinical ability, teaching ability and comprehensive quality of assistant general practitioners. Through the standardized training system, the theoretical learning and practical operation of general medicine are strengthened in conjunction with the actual needs of primary medical services, and training standards for rural assistant general practitioners have been formulated and implemented to enhance the service capacity of rural primary doctors. The curriculum covers the basic knowledge of general medicine and also emphasizes the training of clinical skills. By incorporating grassroots community health service

organizations, the training environment and clinical work content are made to more closely match the actual needs of grassroots general practitioner positions, ensuring that the trainees are capable of fulfilling the work requirements of grassroots medical positions. At the same time, the innovative realization of the standardized training of assistant general practitioners and the adult academic college education in parallel training, enhances the academic level [15].

In the training of general practitioners at the master's level, take the Xi'an Medical College Master's Degree Program of Clinical Medicine (General Practice) as an example, this training mode takes the clinical medical postgraduates admitted by the National Master's Entrance Examination as the training objects, and aims at cultivating high-level applied general medical talents serving the grassroots. Specifically, they are required to master solid basic theories and basic research methods of general medicine, have strong concepts of general medicine and clinical analysis and practice ability, and have good professional ethics. It is also required that the training objects can provide comprehensive, coordinated and continuous primary health care services to individuals, families and community residents with the goal of maintaining and promoting health. In terms of training direction, three main research directions are set up, namely, diagnosis and treatment of common internal medicine diseases, management and intervention of chronic diseases, and rational use of medication in primary health care units, which are in line with the problems that need to be solved in the current primary health care services. Students are trained in small groups under the guidance of postgraduate supervisors who are renowned medical experts with rich clinical practice experience [23].

The training system for general practitioners reflects the differences in policy requirements in the eastern, central and western regions of China. In the eastern region, compared to the central and western regions, specific and clearly quantified targets are given for the development goals, making the policy implementation and evaluation more operational and measurable: according to the Implementation Opinions of the General Office of the Shanghai Municipal People's Government on the Reform and Improvement of the Incentive Mechanisms for the Training and Utilization of Family Medicine Doctors in the Municipality, the goal is to have more than 50% of family medicine doctors in standardized training by 2030, and more than 70% by 2035 by 2030, and more than 70% by 2035 [17]; in the central part of the country, Henan, for example, emphasizes targets such as five qualified GPs for every 10,000 residents in urban and rural areas by 2030, proposed by the state, but its policy is more general in

terms of specific quantitative targets compared to Shanghai [11]; in the western part of the country, such as Yunnan Province, the policy is also more macroscopic in terms of target-setting, and focuses more on specific measures for GP training, such as continuing to The policies of western provinces such as Yunnan Province are also more macro in goal setting, focusing more on specific measures for the training of general practitioners, such as continuing to implement the free training of rural order-oriented medical students, and strengthening the education of in-service and on-the-job health personnel in primary healthcare organizations, etc., but are not as clear as those in the eastern regions in terms of the specificity of the policies and quantitative indicators [28].

Family medicine education in the United States has a long history and a mature system. As early as 1947, the United States began to pay attention to the development of family medicine, established the Society of Family Medicine, and set up a family medicine specialty in medical schools. After years of development, the U.S. primary care medical education has formed a complete education system from undergraduate to postdoctoral, and focuses on interdisciplinary integration, emphasizing the organic combination of basic medicine and clinical medicine, preventive medicine, public health and other fields. This education model aims to cultivate complex general practitioners who possess profound professional knowledge and are proficient in disease prevention, health management, community healthcare and other multidisciplinary skills, in order to cope with the complex and changing challenges of healthcare and improve the health of the whole population. In addition, general medical education in the United States also emphasizes the importance of lifelong learning and encourages medical staff to continuously update their knowledge base to adapt to the rapid development of medical science and technology and the continuous changes in healthcare models, thus ensuring the vitality and cutting-edge of the education system [6].

3.1.2 Education cycle

The cycle of general medicine education in China varies by level. The undergraduate level is generally a five-year program, while the master's and doctoral levels are based on specific research directions and academic requirements. Taking the 3+2 assistant general practitioner training model mentioned in the Research and Practice of General Medicine Talent Training System and Training Mode of Capital Medical University as an example, "3" represents a three-year study of basic medical knowledge and clinical skills in a higher vocational college; "2" on the other hand, represents a two-year professional education and clinical internship in general medicine in undergraduate

schools [15]. According to the training program at the master's level, the recommended years of study are more than three years. Combined with the four-year training cycle of the undergraduate program, the entire training years for being awarded the master's degree in clinical medicine are more than seven years. Therefore, combining the overall training system of this specialty and the master's degree, the completion of the education of general practitioners is generally between five and seven years.

Medical education in the United States generally follows the "4+4" model, which is four years of undergraduate general education in a non-medical field. Students are required to pass the U.S. Medical College Admission Test (MCAT®), followed by four years of medical specialization. For students in Family Medicine, three years of Residency Training are required after the completion of the medical program to gain clinical practice experience and specialized skills. Thus, the training of general practitioners usually spans more than ten years, with at least four years of specialized study followed by a qualifying examination.

3.1.3 Curriculum and clinical practice system

The curriculum of general medical education in China focuses on the combination of basic medicine and clinical medicine, while emphasizing special courses in general medicine such as preventive medicine, public health and community health services. In terms of clinical practice, through hospital rotation and community practice, students master the basic theories and skills of general medicine and cultivate general medicine thinking and service-ability. Taking the training program for master's degree in clinical medicine (general practice) of Xi'an Medical College as an example, the training program adopts a credit system, which covers a variety of aspects such as degree courses, clinical competence training, community health service competence training as well as academic activities. Of the total 52 credits, the degree program lasts 6 months and accounts for 23 credits, while the clinical competency training lasts 21 months and accounts for 21 credits. The degree program focuses on the study of basic theories of general medicine, while the clinical competency training enables the trainees to master the basic skills of diagnosis and management of common and frequent diseases in various clinical departments through rotations in various departments. Community health service competence training is mainly carried out in community health service centers and disease prevention and control centers, aiming to cultivate the concept and practical ability of community-based general medical service. Meanwhile, students are required to summarize their clinical practice experience in their dissertations [23]. In summary, China's

general medicine education demonstrates the characteristics of focusing on the combination of theory and practice, emphasizing prevention and community service, as well as valuing the summarization of clinical practice experience, aiming to cultivate high-level applied general medicine talents serving the grassroots.

The medical education curriculum in the United States is broad and in-depth, covering not only basic and clinical medical knowledge, but also focusing on interdisciplinary content in humanities, social sciences, public health and medical ethics. In terms of clinical practice, the U.S. has implemented a strict residency training system, whereby students majoring in Family Medicine are required to rotate in different departments during their training to accumulate rich clinical experience and undergo rigorous assessment and evaluation.

3.1.4 General Practitioner Training Faculty

China's GP training faculty is a key force in ensuring the quality of GP training. They are responsible for imparting knowledge, skills and clinical thinking patterns in general medicine, and therefore usually require specialized training. In Capital Medical University's GP Teacher Training Syllabus, the training faculty consists of three main parts: theoretical faculty in general medicine, clinical faculty, and primary care practice based faculty. Clinical training base lead faculty members are required to have a bachelor's degree or above, attending physician or above professional and technical title, and have rich clinical teaching experience. Primary care practice base faculty, on the other hand, are required to have college degree or above, attending physicians or above professional and technical titles, and general practitioners and public health physicians with 3 or more years of primary care work experience. Teachers of theoretical courses related to general medicine should have undergraduate education or above, associate degree or above professional and technical title, and have rich experience in primary health service practice and research, as well as full-time teachers of higher medical colleges or general practitioners. The contents and methods of teacher training vary according to the training targets, but generally follow the principles of combining centralized learning with decentralized self-study, and combining theory with practice. The training of teachers in clinical training bases focuses on the teaching of clinical skills and the learning of teaching methods; the training of teachers in primary practice bases focuses on the application of theories of general practice in practical work and the training of the ability of community health services; and the training of theoretical teachers focuses on the teaching of the basic concepts and related theories of general practice [18].

3.2 General practitioners' vocational training and the appraisal system

3.2.1 Duration and content of the training program

In recent years, China has gradually established a system of standardized training for general practitioners, with the aim of upgrading the professionalism and service capacity of general practitioners through systematic training and assessment. Generally speaking, the cycle of regularized training is set at about three years. It aims to enable trainee physicians to master the core knowledge and skills of general medicine in a comprehensive and in-depth manner through a sufficiently long time span. During these two years, trainees are not only required to undergo rigorous theoretical learning, but also participate in rich clinical practice. The standardized training system for general practitioners covers three core areas: basic theory, clinical skills and public health services. Clinical skills training emphasizes practical work, in which trainees participate in consultation, physical examination, medical record writing and other practical work under the guidance of instructors, to improve clinical thinking and operation ability, and focus on cultivating communication and humanistic caring ability, in order to ensure high-quality medical services.

In the United States, the professional standardized training of general practitioners is mainly realized through the residency training system. After completing their studies, general medical students are required to enter designated medical institutions for a three-year residency training. The goal of this stage of training is to have "six core competencies", namely, professionalism, patient care and procedural skills, medical knowledge, practice-based skills, and practice-oriented skills. Knowledge, Practice-based Learning and Improvement, Interpersonal and Communication Skills, and Systems-based Practice [1]. During the training period, they will participate in clinical practice under the guidance of senior general practitioners and gradually master the core skills and knowledge of general medicine. At the end of training, trainees are evaluated on six core competencies, Milestones, and EPAs [2]. Meanwhile, teaching hospitals provide approximately \$20,000 per year in living stipends during residency training to alleviate the financial burden of trainees and to allow them to focus on the study and practice of medicine. In addition, the United States emphasizes the mandatory lifelong education of general practitioners after employment, and implements a system of re-certification of general practitioners, which is valid for six years. Under this system, each general practitioner is required to complete at least 50 hours of continuing education each year, and at the end of each six-year cycle, participate in the reaccreditation

examination organized by the American Academy of Family Physicians (AAFP), and only those who have passed the examination can maintain their qualifications to practice as a general practitioner [4].

3.2.2 Assessment and certification of general practitioners

In China, the assessment and certification system for general practitioners is being gradually improved. According to the relevant regulations of the National Health and Wellness Commission, general practitioners are required to pass a unified qualifying examination, including a theoretical examination and a practical skills test, to assess their professional knowledge and clinical competence. In addition, general practitioners are required to receive regular continuing medical education to maintain and enhance their professionalism. In recent years, the Chinese Government has attached importance to the training and certification of general practitioners and issued a series of policy documents, such as the Opinions on Reforming and Improving the Incentive Mechanisms for the Training and Utilization of General Practitioners, with a view to strengthening the development of the general practitioner workforce and enhancing their social recognition and status.

The American Board of Family Medicine (ABFM) is responsible for the examination and certification of primary care physicians in the U.S. The ABFM has established rigorous certification standards for primary care physicians, including completion of accredited medical school education, internship and residency training, and passing a uniform certification examination. The exam not only examines a primary care physician's specialized knowledge, but also focuses on his or her clinical decision-making, communication skills, and patient management abilities. In addition, medical students are required to pass a three-phase examination of the United States Medical Licensing Examination (USMLE), which examines the principles and mechanisms of health, disease, and treatment modalities, the application of medical knowledge to the provision of supervised patient care, and unsupervised patient management in the outpatient setting, respectively [19]. GPs can obtain licensure to practice general practice by passing the USMLE during their medical school education and the first year of residency training in order to obtain a license to practice unsupervised medicine, and by passing the ABFM's Specialty Examination in Family Medicine in the third year of residency training to obtain a higher level of professional recognition and broader career development [14].

4. Comparison of General Practitioner Service Models in China and the United States

4.1 Job functions

In China, general practitioners are the core force of primary healthcare services, playing multiple roles with rich functions and a wide range of responsibilities. As an important part of the hierarchical diagnosis and treatment system, they are mainly responsible for the first diagnosis at the primary level, providing patients with diagnosis and treatment services for common and multiple diseases. In addition, general practitioners also undertake the task of two-way referral, referring cases beyond their own diagnostic and treatment capacity to higher-level hospitals, and accepting patients back to the grassroots for follow-up management after recovery. In terms of health management, general practitioners are responsible for chronic disease management, health consultation and disease prevention, and they establish a long-term and stable medical service relationship with residents through family doctor contracting services and other forms of personalized health management programs. General practitioners play a bridging role between general hospitals and primary healthcare organizations, and their job function is particularly crucial. In general hospitals, general practitioners need to rely on residents in their districts to seek services on their own initiative, and they should actively promote the sinking of medical services to the grassroots level, and realize the rational allocation of medical resources through the construction of a two-way referral mechanism. With the rise of “Internet+” medical services, the functions of general practitioners have been significantly expanded. Take the pilot remote teaching consultation between Zhongshan Hospital affiliated with Fudan University and Fengxian Xidu Street Community Health Service Center as an example, general practitioners not only undertake traditional diagnosis and treatment services, but also participate in continuing education through remote platforms to improve their professional level. With the help of Internet technology, they fill out consultation application forms, provide real clinical cases, and invite experts from higher-level hospitals to conduct remote consultation and teaching guidance. Remote teaching consultation not only solves the practical problems encountered in primary care, but also enriches the teaching resources for general practitioners, enabling them to master the latest medical knowledge and clinical skills more conveniently. At the same time, general practitioners also take on the important responsibility of protecting patients’ privacy and ensuring

information security during the teleconsultation process. This pilot reflects the diverse roles of general practitioners in the era of “Internet Plus”, which not only strengthens the sharing of medical resources, but also promotes the enhancement of the level of primary care and improves the accessibility and efficiency of healthcare services [29]. In the U.S. healthcare system, the role of general practitioners as the core pillar of the hierarchical diagnosis and treatment system is significantly different from that of their Chinese counterparts, demonstrating a high degree of professionalism and systemic synergy. Within this rigorous system, general practitioners are not only the direct guardians of the health of community residents, but also the key hub for the rational distribution and efficient utilization of medical resources. Through meticulous health assessment and personalized diagnosis and treatment strategies, they establish a long-term relationship of trust with patients, ensure the continuity and coordination of medical services, and significantly improve the overall quality and efficiency of medical services. Compared with China, general practitioners in the U.S. play a more prominent role in hierarchical diagnosis and treatment, with their responsibilities covering basic medical care, preventive health care, health education, chronic disease management, and primary screening for emergencies, forming an all-encompassing coverage of residents’ health needs. In addition, general practitioners also play a key role in emergency response to public health events, not only promoting the improvement of individual health, but also strengthening the health protection network at the community level, which demonstrates their unique value and far-reaching impact on the maintenance of national health.

4.2 Development prospects

In China, the development of general practitioners faces multiple challenges, among which the issue of remuneration is particularly prominent. According to survey data from Physician’s Journal in 2018, the income of general practitioners is generally low and there are significant differences between regions, but overall, their income level is much lower than that of their counterparts in the United States. While general practitioners in eastern coastal cities are relatively better off, the monthly income of general practitioners in the central and western regions is generally concentrated between 2,000 and 4,000 yuan, with only a few reaching or exceeding 6,000 yuan, a situation that significantly affects the attractiveness of general practitioners’ careers and the career choices of medical school students. In addition, the construction of a general practice medical system still relies on the government to take

the lead, the participation of social forces is insufficient, and the regulatory mechanism and incentive mechanism have yet to be perfected, which further restricts the career growth and treatment enhancement of general practitioners [29].

In contrast, the career development of general practitioners in the United States presents a very different picture. Their salary composition usually includes both basic salary and performance pay, and the overall level is significantly higher than that in China. In the U.S., general practitioners' compensation is more diversified and generally adopts a hybrid payment method, which not only guarantees the stability of basic salary, but also incentivizes doctors to provide better quality services through performance pay. This compensation model not only attracts a large number of excellent talents to join the field of general medicine, but also promotes the continuous innovation and improvement of general medical services. In addition, the United States has a comprehensive training system and a strict accreditation system to ensure the professionalism and service quality of general practitioners. With the accumulation of qualifications and continuous improvement in job evaluation and assessment, general practitioners have the opportunity to be promoted to management positions and enjoy higher salaries and professional status. This virtuous cycle of career development not only enhances the sense of honor and belonging of general practitioners, but also lays a solid foundation for the stability and development of the U.S. healthcare system.

5. Questions and discussions

5.1 Summary of issues

5.1.1 Problems of social awareness and importance

In China, the social recognition of general practitioners is relatively low, which directly contributes to the general neglect of their professional status and importance. On the one hand, there is a mismatch between supply and demand in the field of general practice medical services, with a weak foundation of primary general practice medical care and a shortage of resources, which makes it difficult to meet the growing health needs of residents. Urban and rural residents do not have a deep understanding of general medical care and lack a full appreciation of the content and value of their services, leading to an underestimation of the value of the work of general practitioners. On the other hand, there is a low level of trust between general practitioners and patients, and residents are more inclined to choose specialized medical services, which further

aggravates the social cognitive dilemma of general practitioners. More fundamentally, there is a general misconception in society that GPs are less specialized and less skilled than specialists. This perception stems not only from the strengthening trend of specialization in the traditional healthcare system, but also from the fact that the educational background and training pathway of general practitioners is different from that of specialists, which leads to misunderstanding of their roles and contributions among the general public and even within the healthcare system.

In addition, although a number of measures have been introduced at the policy level to emphasize the importance of general practitioners, there are still obvious deficiencies in the protection of the rights and interests of general practitioners, career development paths and incentive mechanisms in the process of concrete implementation. Issues such as low remuneration and unfavorable status of title evaluation and scientific research support have further weakened the career attractiveness and social recognition of general practitioners. These factors interact with each other and together constitute the current situation of social cognition leading to insufficient attention faced by Chinese general practitioners.

5.1.2 Fostering problems at the schooling level

Although China's general medicine education has made remarkable progress in recent years, there are still many problems at the school education stage. The knowledge and concept of general medicine in China's medical education system are not yet popular and biased. For a long time, the medical profession and society at large have had a one-sided understanding of general medicine, which is often regarded as a "jack-of-all-trades" discipline rather than a systematic and specialized medical field. This perception has led to the marginalization of general medicine in medical education and a lack of sufficient attention and investment. At the same time, some medical students and their parents are skeptical about the career development prospects of general practitioners, believing that they lack specialization and room for development, which further affects the quality of the student population and the enthusiasm for training in general medical education.

Secondly, the specialty setting and curriculum system of general medicine education are not yet perfect. At present, although some medical schools have established the specialty of general medicine, the curriculum still favors knowledge of basic medicine and clinical medicine, and lacks interdisciplinary fusion courses for the characteristics of general medicine, such as public health, preventive medicine, medical ethics, and so on. This leads to difficulties for students in developing comprehensive thinking

and serviceability in general medicine during their school years. In addition, the evaluation system of medical education in China still pays more attention to examination results and mastery of theoretical knowledge, while neglecting the evaluation of practical ability and comprehensive quality.

Finally, the faculty of general medicine education is relatively weak. Because of the late start of general medicine in China, there is currently a lack of general practitioners with rich clinical and teaching experience as faculty members. Many faculty members of general medicine in universities are part-time physicians from other specialties, who may have deficiencies in the theory and practice of general medicine, making it difficult for them to provide high-quality teaching and guidance to students. In particular, there are major problems with community-based family medicine faculty. At present, most of these faculty members come from community-based primary care physicians, who form teaching teams after a few days to four months of training, with no formal exit assessment and varying levels of proficiency. There has been no clear discussion of how to train grass-roots faculty, the time of training and the goals of training.

In addition, there are shortcomings in the practical teaching aspect of general medical education. Due to the insufficient number of primary health care organizations and general practitioners, it is difficult for students to obtain sufficient opportunities for clinical practice during their school years, making it difficult for them to achieve the expected target teaching results. This seriously affects the mastery of students' skills in general practice and the training of their clinical thinking.

5.1.3 Problems of occupational access and assessment and certification

China's professional access assessment and certification system for general practitioners is not yet sound, and there are many problems. Due to the low popularization of general medicine education, many graduates of non-general medicine majors undergo conversion training and obtain the qualification of the general practitioner through short-term training, etc., and their professional quality is not up to the standard, which to a certain extent reduces the overall quality of the general practitioner team.

Secondly, Chinese general practitioners are deficient in post-employment lifelong education. This problem is mainly reflected in the insufficient attention paid to the continuing education of general practitioners, the insufficient understanding of primary care staff of the trends of health care reform and the frontiers of general medicine development, and the tendency to emphasize practice over theoretical learning. In addition, practical factors such as

work-study conflicts and lack of incentives are also possible reasons why general practitioners do not pay attention to continuing education, which restricts the enhancement of their professional capacity and service level.

Finally, the career path of general practitioners is unclear. Due to the unclear positioning of general practitioners in the healthcare system, their career development paths are often subject to many restrictions. Many general practitioners lack clear promotion channels and incentives during their career development, resulting in low motivation and career satisfaction. This ambiguity in career development paths not only affects the personal growth and career development of general practitioners, but also restricts the sustained and healthy development of the cause of general medicine.

5.2 Comparison of research results

Through a systematic review, this study thoroughly explored the differences between Chinese and American general practitioners in two core dimensions, namely, the training model and the service model. Previous studies have mainly focused on the comparative analysis of the training model of Chinese and American general practitioners, with detailed discussions on the dimensions of tuition standards and research base settings [12][14]. In addition, this study not only provides an international comparative perspective on the differences in service models, but also makes a more detailed explanation, which is missing in previous studies. A few studies mentioned the problems of Chinese general practitioners in the service system, for example, Yin Pei et al.'s study pointed out that the lack of mandatory requirements and norms for the first community visit in China led to the tendency of patients to large hospitals, and that the content of general medical services was not uniform, and the low treatment of medical staff made it difficult to attract high-level talents [27]. Finally, this paper includes the master's education stage into the research scope in the comparison of the training mode, which is also relatively lacking in the existing research. The current research on the training of the master's stage mainly focuses on the evaluation of training quality and curriculum [5][20][26]. On the whole, this study realizes the deepening and expanding of the existing research.

6. Conclusions

To elevate the societal recognition and appreciation of general practitioners (GPs), it is imperative to disseminate information about their roles and professional values among the populace. This will enhance the overall awareness of GPs within society. When formulating health

policies, greater emphasis should be placed on GPs, with a focus on refining related policies to establish a comprehensive policy framework for them. Simultaneously, optimizing the allocation of medical resources and bolstering the capacity of primary general practice medical services are crucial steps in mitigating the supply-demand mismatch. Furthermore, fostering a closer doctor-patient communication mechanism and bolstering patients' trust in GPs are pivotal in advancing social cognition.

Addressing the challenges in general medicine education necessitates optimizing the curriculum, reinforcing interdisciplinary integration and practical skills training, and strengthening faculty development to elevate teaching proficiency and professionalism. Additionally, augmenting clinical practice opportunities and enhancing students' practical skills and clinical reasoning are integral components of cultivating competent GPs.

To guarantee the quality of the GP workforce, it is advisable to elevate professional entry standards and refine the assessment and certification system. By referencing the assessment benchmarks of developed countries, a holistic evaluation of GPs' professionalism and service capabilities can be conducted. Post-employment continuing education should be intensified, with consideration given to adopting a GP re-certification system to ensure the GP workforce remains advanced. Concurrently, the role of GPs within the healthcare system should be clearly defined, with distinct career development pathways and incentive mechanisms provided. By optimizing the student pool based on heightened societal importance, more exceptional talents can be attracted to dedicate themselves to the field of general medicine.

This study endeavors to explore the disparities and characteristics of GP training and service models between China and the United States. It not only synthesizes and analyzes existing academic research findings but also reinforces the study's authority and practical application value by incorporating diverse official policy documents and implementation programs. This holistic approach aids in addressing the actual needs and policy directions of current GP workforce development more comprehensively. Through comparative analysis, this study uncovers the similarities and differences in GP training and service models between China and the United States, offering valuable insights for the future progression of the general medicine field, ultimately promoting the construction of China's tiered diagnosis and treatment system.

Despite this study's comprehensive and in-depth exploration of the China-US comparison of GP training and service models, certain limitations persist. Firstly, due to the objective constraint of insufficient current information, it is challenging for our study to comprehensively cover

all aspects of GP training and employment, despite our diligent efforts to retrieve existing academic findings and policy documents. Consequently, the research findings lack comprehensiveness. Secondly, in terms of study specificity, the discussion on specific issues at each stage is not yet sufficiently in-depth, potentially failing to fully reveal the underlying causes and solutions. Additionally, this study primarily employs a review methodology, making it difficult to quantitatively measure GP training effectiveness, working conditions, and their influencing factors. To address this limitation, future studies may consider adopting quantitative research methods, such as questionnaire surveys, to more accurately measure and evaluate GP training effectiveness and working status by collecting first-hand information. This will provide a more specific scientific basis for improving general medical education.

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