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Article

Reflections and Explorations on Medical Talent Education in the Context of "New Medicine"

Letian Zong [1], Honejie Luo [2], Shen Yu [3,*] and Lu Zhang [2,*]

[1] *West China School of Medicine, Sichuan University, Chengdu 610017, China*

[2] *Department of Dermatology and Venereology, West China Hospital, Sichuan University, Chengdu 610017, China*

[3] *Department of Anesthesiology, West China Hospital, Sichuan University, Chengdu 610017, China*

Abstract: With the exponential advancement of technology and continuous progress within the medical field, the traditional medical education model demonstrably fails to adequately address the demands of contemporary medical education. "New Medicine" fundamentally emphasizes the holistic development of medical professionals, encompassing humanistic literacy, interdisciplinary competence, and scientific innovation capabilities. This article systematically explores three critical dimensions: the development of humanistic literacy, foundational medical education coupled with clinical skills training, and the development of scientific research proficiency. It subsequently proposes diverse innovative pedagogical approaches and strategic frameworks for talent development. The overarching objective is to cultivate comprehensively capable medical professionals possessing robust medical knowledge, exemplary clinical skills, and substantive research capabilities. Through these deliberate explorations, medical education will be strategically positioned to more effectively satisfy societal requirements for high-level medical professionals, thereby fostering the sustainable advancement of the medical enterprise.

Keywords: New medicine; medical education; interdisciplinary comprehensive ability; innovation ability; humanistic literacy

1. Introduction

With the rapid development of science and technology in medical field, the education of medical professionals needs to focus on comprehensive development, including humanistic literacy, clinical practice, and interdisciplinary scientific innovation ability—on the basis of traditional knowledge and skill-based education. "New medicine" refers to a new medical education model that adapts to the needs of modern medical development, integrates interdisciplinary knowledge, aims at developing innovative talents, shifts from treatment-oriented to life-cycle medicine covering prevention, treatment, and health maintenance, and emphasizes the equal importance of clinical practice and research capabilities [1,2]. "New medicine" focuses on the comprehensive development of medical professionals, emphasizing the need to possess interdisciplinary comprehensive ability, scientific and technological innovation ability, and social responsibility. Among them, interdisciplinary comprehensive ability requires medical talents to master solid medical knowledge and clinical skills, while having interdisciplinary knowledge reserves to comprehensively apply multi-disciplinary

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* Corresponding: Shen Yu (dr.shen@wchscu.edu.cn); Lu Zhang (zhangluhx@scu.edu.cn).

knowledge to solve complex medical problems. Scientific and technological innovation ability encourages medical talents to keep up with the forefront of technology, actively participate in research projects, master the latest medical technologies and methods, and contribute to scientific and technological progress in the medical field [3]. Social responsibility requires medical talents to have a strong sense of social responsibility and mission, actively participate in public health services, health education, disease prevention, and other work, and make positive contributions to the social health cause [4,5].

The comprehensive development of medical professionals under the background of "new medicine" will help them better integrate into and serve society, and promote the sustained high-level development of the medical cause. This paper will reflect on and explore the education of medical professionals from three aspects: humanistic literacy, interdisciplinary comprehensive ability, and scientific and technological innovation ability of medical students.

2. Education of Humanistic Literacy

Medicine is an interdisciplinary subject, and medical services involve direct practical interaction between doctors and patients. Therefore, in the field of medical education, it is particularly crucial to strengthen the awareness of teamwork and doctor-patient communication skills of medical professionals [6]. This process aims to shape medical students' moral concepts and personality traits, guiding them to form correct value judgments and professional ethics.

Firstly, within medical ethics instruction, introducing discourse on the dignity of life and patients' rights effectively facilitates medical students' adherence to ethical principles in future clinical practice [7]. Secondly, the adoption of diverse pedagogical models, such as case analysis and clinical scenario simulation, cultivates students' humanistic care for patients and enhances their teamwork capabilities. Role-playing exercises enable students to profoundly comprehend patients' experiences and requirements, thereby fostering greater empathy and emphasizing communication proficiency within healthcare delivery. Thirdly, refining the mentor system, wherein distinguished senior physicians provide direct mentorship to medical students, constitutes an efficacious strategy for reinforcing moral education through the exemplary transmission of medical ethics and professional ethos. Furthermore, encouraging medical student participation in community health service initiatives enables experiential learning of medicine's societal value through practical engagement, nurturing teamwork awareness, practical communication skills, and augmenting social responsibility. Initiatives such as "campus running," running check-ins, and recreational sports meetings strengthen physical exercise regimens, improving individual physical fitness and health status [8]. The introduction of literature and arts courses, integrated to a certain extent with medical knowledge, develop medical students' aesthetic discernment and artistic literacy, contributing to enhanced personal competence and facilitating doctor-patient communication.

Through the comprehensive application of the above methods, medical education can not only impart professional knowledge but also develop students' moral qualities, enabling them to become holistic medical students with both ability and integrity and a broad vision. The education of medical humanistic literacy runs through the entire education process, and the comprehensive development of medical talents can enhance patients' medical experience and satisfaction, strengthen understanding and trust between doctors and patients, and contribute to the stable development of the medical cause.

3. Basic Medical Education and Clinical Skills Training

3.1. Undergraduate Stage

The goal of undergraduate medical education is to cultivate medical students into professionals with solid medical knowledge and clinical skills. Currently, in the instruction of basic medical knowledge and clinical abilities, lectures and internships are chiefly employed, causing medical students to achieve inadequate deep comprehension and fail to foster independent learning skills. To encourage deep mastery of medical knowledge among undergraduate students, bolster their independent learning skills, and create a solid groundwork for future clinical practice and lifelong learning, the adoption of varied innovative pedagogical methods is

recommended. First, the design of clinical skills simulation training courses allows medical students to verify and explore medical concepts through hands-on practice. This practical teaching not only enhances their understanding of medical knowledge principles but also exercises their practical clinical competence [9]. Second, applying flipped classrooms to encourage medical students self-study through videos and reading materials before class and engage in more discussions and applications in class, which helps cultivate their autonomous learning and thinking abilities [10]. Third, the Problem-Based Learning (PBL) model enables medical students to conduct research around specific problems through group discussions. This interactive learning approach not only enhances their ability to independently retrieve medical knowledge and summarize information but also strengthens their awareness of teamwork. Fourth, the Team-Based Learning (TBL) and Case-Based Learning (CBL) models further enhance medical students' clinical thinking and decision-making abilities by deeply analyzing cases and solving specific clinical problems through teamwork [11]. The application of these teaching methods allows students to master necessary medical knowledge while improving clinical skills in practice. Through this comprehensive teaching model, medical students can lay a solid foundation of medical knowledge in the undergraduate stage and flexibly apply knowledge to solve actual clinical problems.

3.2. Postgraduate Stage

The training programs for medical master's degree candidates vary based on their fundamental designation as either professional or academic degrees. Professional master training focuses on clinical practice, while academic masters emphasize solving or optimizing specific clinical problems through scientific research. Therefore, different teaching methods can be adopted for these two kind of students. For professional masters, teaching methods place greater emphasis on practicality and application, aiming to cultivate highly competent, front-line clinical physicians. These students typically undergo rigorous standardized residency training and comprehensive rotational assessments across different departments. This structure requires rotations through diverse specialties, broadening their clinical expertise. Meticulous record-keeping and detailed self-summaries are mandatory at the conclusion of each rotation, enabling students to integrate medical knowledge comprehensively within real-world clinical contexts [12]. Furthermore, medical simulation teaching serves as a vital auxiliary method. By faithfully recreating clinical scenarios, it deepens students' reflection on and understanding of clinical skills, significantly sharpening their situational awareness, crisis identification, and emergency management abilities. Hierarchical skills training also forms a cornerstone of professional master education. It strategically designs clinical skill exercises of escalating difficulty, tailored to students' evolving learning stages and proficiency levels, thereby progressively refining their hands-on clinical capabilities [13]. For academic master, teaching methods focuses more on imparting scientific research and experimental techniques. Academic masters typically impose more rigorous academic standards, encompassing thesis requirements and research projects that demand robust theoretical foundations and investigative skills. Students must also demonstrate proficiency in discerning and formulating scientific inquiries within clinical settings. Under the guidance of their graduate advisors, they engage in project design and research, author and publish academic papers, and share research findings at domestic and international academic conferences. Concurrently, academic master's education may incorporate additional lectures on experimental theory and methodology, bolster practical training in experimental skills, and enhance the cultivation of research and scholarly abilities. Through these distinct pedagogical approaches, both professional and academic master's programs cultivate professionals adept in clinical skills and scientific research capabilities [14].

Medical doctoral training should pay more attention to independent learning, thinking, and lifelong learning abilities to adapt to the rapid development and knowledge update in the medical field.

Medical doctoral students should remain updated on the latest developments by exploring top-tier domestic and international journal publications. They methodically consolidate fundamental concepts and techniques across relevant research fields, develop intriguing scientific inquiries and draft initial research blueprints. Finally, they participate in profound exchanges and critical deliberations with their supervisors to hone their approach. They are encouraged to actively participate in domestic and international academic conferences.

Activities such as academic speeches and poster presentations not only exercise students' scientific research expression abilities but also spread the latest research progress through sharing and communication, allowing them to learn relevant experience from renowned scholars in the concerned field at close range, discuss key and difficult issues, and stimulate scientific inspiration and active thinking. Through these methods, medical doctoral students can not only maintain the frontiers of their professional knowledge but also cultivate independent thinking and problem-solving abilities in scientific research, thereby playing a leading role in the medical field and promoting the progress and innovation of medical science.

4. Education of Scientific Research Capabilities

In medical education, the education of basic medical knowledge and clinical skills lays a solid theoretical foundation for medical students. However, with the continuous deepening of medical research and the increasing complexity of clinical practice, merely mastering basic knowledge is no longer sufficient to address the challenges of modern medicine. Therefore, developing scientific research capabilities has become an indispensable part of medical education. The education of scientific research capabilities can not only make up for the lack of scientific research training in traditional medical education but also enable medical students to possess the abilities of problem-solving and innovative thinking. Such capabilities are crucial for promoting the development of medical science, improving clinical diagnosis and treatment levels, and responding to new diseases and health problems that may emerge in the future. Therefore, the following will explore how to effectively cultivate students' scientific research capabilities in medical education.

4.1. Undergraduate Stage

Developing scientific research skills among medical undergraduates evolves as a multi-faceted, layered progression, integrating a spectrum of instructional strategies and experiential engagements. Its fundamental objective is to ignite students' investigative passion, propelling their quest for discovery through the revelation of challenges that ignite intense curiosity and cognitive hunger. First, integrate the Research-based Learning (RBL) model. RBL is a student-centered teaching method that emphasizes student initiative and participation, aiming to improve students' autonomous learning ability and creativity. The core concept of RBL is to promote knowledge construction and innovative thinking through real-life scenarios and cooperative communication. Second, set up basic scientific research courses, such as skill-based training in literature retrieval and experimental operations, which provide medical students with fundamental research methods. Design exploratory experimental courses to allow students to independently design experiments for exploring medical problems, cultivating their ability to propose and solve issues. Offer interdisciplinary courses like artificial intelligence, machine learning, materials science, etc., which not only broaden medical students' knowledge but also enhance their ability to apply such knowledge to solve medical problems. Third, by participating in scientific research competitions such as the College Students' Innovation and Entrepreneurship Training Program and the "Internet+" College Students Innovation and Entrepreneurship Competition, medical students can deepen theoretical learning in practice, transform static knowledge into dynamic applications, stimulate creativity, and cultivate teamwork and project management capabilities. These competitions not only provide a platform to showcase innovative thinking but also serve as an important channel for medical students to initiate practical exploration. Participation in academic conferences is equally vital, as it offers opportunities for medical students to communicate with experts in the field, helping them broaden horizons and keep abreast of the latest research trends. Furthermore, the implementation of the undergraduate tutor system enables students to engage in academic research activities such as project studies under tutors' guidance, thereby enhancing research awareness and improving scientific research capabilities.

The education of scientific research skills for medical undergraduates forms an integrated initiative. These synergistic activities and curricula collaboratively advance the development of medical students' research proficiencies, laying a durable foundation for their future investigative endeavors in the medical area [15–18].

4.2. Postgraduate Stage

4.2.1. Clinical Professional Master's Program

The education strategies for clinical professional master's students should ensure that students possess solid clinical practice abilities while strengthening the education of scientific research capabilities. This strategy places students in real clinical environments, stimulating them to think diligently, summarize frequently, and discover actively during the practice of medical diagnosis, treatment, and decision-making. They are encouraged to propose scientific questions derived from clinical practice and further explore them. The parallel implementation of a double tutorial system (clinical tutor + basic research tutor) can be adopted, combining the innovative methods and academic guidance of basic research tutors with the practical experience and industry insights of clinical tutors to jointly undertake the education of students' scientific research capabilities. When determining research directions and topics, dual tutors can guide students to select practical and innovative topics based on their respective expertise and resources, ensuring that research results can positively impact clinical application and transformation [19].

Students are encouraged to actively participate in academic conferences and exchange activities to showcase their research achievements and experiences. Establishing multidisciplinary cross-research cooperation networks allows medical teams to jointly apply for research projects and funds. Through cooperative projects, interdisciplinary collaboration among different departments is promoted, driving the in-depth development of clinical research. Throughout the collaborative process, institutions must prioritize team development and talent cultivation to establish a robust foundation for subsequent research endeavors. This educational paradigm not only cultivates students' proficiency in addressing intricate clinical challenges but also hones their scientific research acumen and innovative capacities. Consequently, graduates are equipped to function not merely as clinical practitioners, but also as creators and disseminators of medical knowledge, thereby advancing the discipline of medical science. The education of such comprehensive capabilities is of great significance for improving the quality of medical services, promoting medical innovation, and meeting society's needs for high-level medical professionals.

4.2.2. Clinical Academic Master's Program

The scientific research activities of clinical academic master's students should be closely integrated with clinical needs to achieve effective transformation between scientific research innovation and clinical application. During research, academic master's students use sufficient and complete time to focus on new ideas and technologies at the scientific frontier, applying new technologies to the field of clinical diagnosis and treatment, thereby generating new clinical research ideas. The application of Artificial Intelligence (AI) technology in the field of clinical research provides new research tools and methods for academic master's students. Artificial intelligence technology facilitates the processing of medical data, the interpretation of medical imagery, and the advancement of diagnostic and therapeutic support, with particular efficacy in domains including tumor detection, genomics analysis, drug screening, and targeted design. Academic master's students can improve research efficiency and quality through AI large language models. In addition, AI technology assists in pharmacological research and drug development, bringing enormous support to pharmacological research and drug development through steps such as target prediction and drug component screening.

To promote the development of clinical medicine, the scientific research activities of academic master's students should focus on major clinical needs, strengthen research on new targets based on technologies such as genomics, structural biology, and computational biology, and carry out forward-looking layouts in frontier biotechnological fields such as synthetic biology and gene editing. Meanwhile, promote the application of frontier technologies such as artificial intelligence, omics technology, and organoids in clinical research, and strengthen the research and development of innovative medical device products, key material technologies, and core components. The scientific research activities of clinical academic master's students should be oriented toward clinical needs, combine frontier technologies such as artificial intelligence, and carry out multidisciplinary cross-integrated research to promote the development and innovation of clinical medicine.

Through such research activities, not only can the research capabilities of academic master's students be enhanced, but also scientific evidence can be provided for clinical medicine, promoting the progress of medical science [20–22].

4.3. Doctoral Stage

The master's degree stage represents the first step in scientific research training, focusing on methodological learning and in-depth participation in the entire research process. In contrast, the doctoral stage emphasizes the ability of independently constructing a full research project design. During the education of scientific research capabilities, doctoral students must deeply understand the profound connotations of the "new medicine" concept, which not only includes the in-depth understanding and application of emerging technologies in the medical field such as artificial intelligence, big data analysis, and cloud computing but also covers a profound awareness and need for interdisciplinary integration. Such comprehensive understanding is crucial for doctoral students to identify and select research directions aligned with future medical development trends.

Through in-depth communication with clinicians and participation in practical clinical work, doctoral students can identify urgent medical problems derived from and close to clinical practice. Given that the "new medicine" particularly emphasizes interdisciplinary integration, doctoral students should actively learn and master knowledge in related fields such as bioinformatics, medical engineering, and public health to broaden their research horizons and thinking. In-depth discussions and exchanges with tutors and peers can help doctoral students evaluate the feasibility, innovativeness, and potential scientific and clinical application values of their projects. After determining the research topic, doctoral students need to meticulously design and plan a detailed research plan, including clear research objectives, scientific research methods, expected outcomes, and reasonable time arrangements. In the implementation of research activities, doctoral students should fully utilize modern technological means, such as advanced technologies like big data analysis and artificial intelligence algorithms, to improve research efficiency and the quality of results [23]. Although medical talents have received basic scientific research training and mastered necessary research methods and skills during the doctoral stage, with the rapid development of medical science and the increasing complexity of research tasks, relying solely on basic research capabilities is far from sufficient. Therefore, in subsequent education, the scientific research capabilities of medical professionals must be further enhanced and perfected.

Under the guidance of the "new medicine" innovation model, medical education is standing at a new historical starting point, facing unprecedented changes. This transformation is not only about imparting professional knowledge but also about emphasizing the comprehensive development of students, covering the overall improvement of moral education, clinical skills, and scientific research capabilities. In the education of humanistic literacy, we focus on the comprehensive education of medical students in moral, intellectual, physical, aesthetic, and labor aspects, integrating ideological and political elements into classrooms; in basic medical education and clinical skills training, we apply teaching methods such as flipped classrooms, clinical simulation practice, PBL, TBL, and CBL; in scientific research capability education, we introduce interdisciplinary courses and adopt teaching models like RBL. These educational methodologies are designed to cultivate medical professionals who not only possess robust medical knowledge but are also adept at applying this knowledge to address practical challenges.

Looking to the future, the "new medicine" will continue to drive the development of medical education. With the continuous advancement of technologies such as artificial intelligence and big data, medical education will place greater emphasis on the integration of practice and innovation. We expect that through continuous innovation in education and training methods, strengthening interdisciplinary cooperation, and continuously improving the quality of medical education, we can meet society's needs for high-level medical professionals.

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The authors declare no conflict of interest.

References

1 He K, Wang L. Development Strategy of "New Medicine" Under the Background of Healthy China. *Chinese Engineering Science* 2019; **21**: 98–102.

2 Peng ST. Accelerating the Construction of "New Medicine" and Focusing on Cultivating Excellent Medical Innovative Talents. *China Higher Education* 2020; 35–37.

3 Jiang S, Gong L, Yang JK, *et al.* Exploration and Practice of Cultivating Scientific Research Potential of Medical Freshmen under the Background of New Medicine. *Health Vocational Education* 2024; **42**: 11–14.

4 Liu Y. Research on the Current Status and Improvement Strategies of Medical Humanities Education in Chinese Medical Colleges and Universities. Ph.D. Thesis, Hebei Medical University, Shijiazhuang, China, 2022.

5 Tang S. Research on the Innovative Pathways of Blended Teaching Model for Ideological and Political Courses under the New Medicine Framework. *Health Vocational Education* 2024; **42**: 67–70.

6 Li X, Chen XL, Ai M, *et al.* Reflection and Exploration on Psychiatry Talent Cultivation under the New Medicine Framework. *Continuing Medical Education* 2024; **38**: 43–46.

7 Li XH, Gao Y, Ma C, *et al.* Research on the Four-Dimensional Collaborative Education Model of Ideological and Political Education, Research, Teaching, and Entrepreneurship for Medical Graduate Students: A Case Study of Ningxia Medical University. *Quality Education in Western China* 2022; **8**: 17–20.

8 Wang CL, Liang D. Practice and Exploration on Integrating Vocational Core-value Education into Physical Education Courses for Medical Students. *China Higher Medical Education* 2023; 87–88.

9 Zhong Y, Li YM, Qi L, *et al.* Practice and Reflection on Exploratory Experiments in Experimental Physiological Science. *Basic Medical Education* 2024; **26**: 940–943.

10 Zhang Y, Zhao HY, Wang SQ, *et al.* Exploration on the Application of Flipped-Classroom and Case-based Teaching in Pathophysiology Experimental Teaching. *Basic Medical Education* 2024; **26**: 236–240.

11 Zong KS, Li SY. Application of CBL-PBL-TBL Combined Teaching Method in Clinical Practice of Grass—Roots Hospitals. *Chinese Continuing Medical Education* 2021; **13**: 27–31.

12 Meng XZ, Xue DB, Liang ML, *et al.* Preliminary Exploration of Precision-Based Methods for Standardized Training of Resident Physicians. *Chinese Continuing Medical Education* 2024; **16**: 172–175.

13 Tan FX, Zhang JS, Lai MY, *et al.* Exploring the Current Situation and Countermeasures of Clinical Skills Training for Professional Master's Students in Clinical Medicine under the Background of New Medical Discipline Construction. *Journal of Modern Medicine & Health* 2024; **40**: 1786–1789.

14 Wang LH, Ren Y, Jiang JF, *et al.* Exploration on the Training Mode of Academic Master-degree Students in Pathology. *Journal of Nongken Medicine* 2020; **42**: 360–362.

15 Ding S. Strategies for Cultivating Innovation Ability of Medical Undergraduates under the Background of New Medicine. *Journal of Medical Education Research and Practice* 2024; **32**: 687–691.

16 Tian J, Shan Y, Liu Z, *et al.* Research on the Cultivation Model of Innovation and Entrepreneurship Competence for Medical Undergraduates through Study-Research-Innovation- Application Integration. *Health Vocational Education* 2024; **42**: 1–4.

17 Li CM, Xiong TY, Ma YZ. Research on the Early Research Cultivation of Eight-Year Clinical Medicine Students under the Undergraduate Mentorship System. *Science and Technology Innovation and Brand* 2024; 71–73.

18 Wang QQ, Chen PF, Lin XF, *et al.* Research on the Application of Research Mentorship System in Research Training for Medical Undergraduates. *Zhejiang Medical Education* 2024; **23**: 145–149.

19 Li DM, Chen JY, Wan WH, *et al.* Research on the Implementation and Exploration of the Double Mentorship System for Professional Degree Master's Students in Clinical Medicine under the Background of Medical-Education Synergy. *Medical Education Management* 2022; **8**: 319–324.

20 Liu H, Ha DS. Discussion on Improving Scientific Research Innovation Ability of Academic Master Students in Clinical Medicine. *Chinese Continuing Medical Education* 2020; **12**: 79–82.

21 Chen HF, Liu CQ, Liu T, *et al.* Status and Enlightenment of Academic Master's Education in Nursing at Japanese National Universities. *Nursing Research* 2024; **38**: 3911–3915.

22 Yu XY, Li LL, Wang Z. Current Situation and Reform of Scientific Research Training for Professional Degree Master Students in Clinical Medicine. *Continuing Medical Education* 2024; **38**: 1–4.

23 Zhang XJ, Zhang J, Gu K, *et al.* Current Situation and Reflection on Training Models for Medical Doctoral Students: Analysis Based on Training Quality. *Modern Vocational Education* 2024; 149–152.