Journal of Contemporary Educational Research, 2024, Volume 8, Issue 11
http://ojs.bbwpublisher.com/index.php/JCER
ISSN Online: 2208-8474
ISSN Print: 2208-8466

Research on Teaching Reform of Basic Medical Courses in Comprehensive Universities Oriented Towards "Clinical Competency"

Lei Liu[1], Jialin Zhang[1], Rongrong Ye[1], Jiamei Wu[2], Hanjun Song[1], Wei Jiang[1], Xiaomeng Zhang[1], Baixin Wang[1]*

[1]Jiamusi University, Jiamusi 154002, Heilongjiang Province, China
[2]Basic Medical College, Baicheng Medical College, Baicheng 137000, Jilin Province, China

***Corresponding author:** Baixin Wang, wbaixin@163.com

Abstract: Through this study, we aim to construct a teaching model for basic medical courses that enhances "clinical competency." We explore the optimal methods and pathways for the organic integration of exam-oriented teaching and professional teaching, optimize teaching efficiency, improve teaching quality and educational effectiveness, and provide theoretical support for the cultivation of clinical medical talents in China. The goal is to establish a talent cultivation objective oriented towards "clinical competency," promote the teaching reform of basic medical courses in comprehensive universities, facilitate the transition of basic medical course teaching from "teacher knowledge presentation" to "student knowledge construction," and cultivate high-quality medical talents with clinical competency.

Keywords: Clinical competency; Basic medical teaching; Teaching reform; Medical talent cultivation; Comprehensive universities

Online publication: December 3, 2024

1. Introduction

At the current stage, the medical education model in China is gradually shifting, posing higher requirements for the comprehensive quality of medical talents. Addressing issues such as the mismatch between the supply of medical talents from medical schools and social demand, as well as the lack of targeted training, this article focuses on the reform of basic medical education and teaching. Through the implementation and management of the basic medical teaching model in comprehensive universities, we aim to strengthen the integrity of medical education, drive the reform of basic medical course teaching, and improve the quality of medical student training.

2. The connotation and composition of job competency

Job competency covers a comprehensive range of abilities from basic knowledge to advanced skills, and further to emotions, values, and self-motivation [1,2]. It is divided into four main aspects: knowledge and understanding, practical skills, professional literacy, and clinical thinking. The traditional education model often neglects the cultivation of skills and attitudes, while the cultivation of job competency not only emphasizes students' knowledge mastery but also focuses on whether they truly possess the skills required for the job, providing patients with the most professional and humane medical services [3,4].

3. Advantages of cultivating medical students in comprehensive universities

3.1. Advantages of interdisciplinary integration

It promotes medical innovation and the cultivation of compound talents. The interdisciplinary integration of multiple disciplines in comprehensive universities brings new ideas and methods to medical research and clinical practice. For example, the combination of medicine and engineering has given rise to the field of biomedical engineering, leading to the development of various advanced medical equipment and devices such as artificial joints and heart pacemakers, which have improved the level of disease diagnosis and treatment. The combination of medicine and computer science has driven the development of medical informatics, making the management, analysis, and application of medical data more efficient and providing support for precision medicine. Simultaneously, it is conducive to cultivating medical talents with interdisciplinary knowledge and skills. For instance, talents who understand both medicine and data analysis can utilize big data technology to conduct deep mining of medical data, providing a scientific basis for disease prevention, diagnosis, and treatment.

3.2. Advantages of teaching resources

Comprehensive universities provide rich curriculum resources, a high-quality teaching team, and resource-sharing support for medical student training. They offer a wide range of course options to broaden students' knowledge and horizons. For example, studying psychology courses helps medical students better understand patients' psychological states and improve doctor-patient communication skills. A large number of excellent teachers and researchers from multiple disciplines bring interdisciplinary teaching philosophies and methods, enhancing teaching quality and academic level. Medical professionals can share advanced facilities across various disciplines in the university. For instance, the shared resources of comprehensive university libraries and multidisciplinary laboratory facilities provide medical students with a wide range of learning materials and multi-channel research conditions.

3.3. Advantages of scientific research platforms

The national key laboratories, engineering technology research centers, and other scientific research platforms of comprehensive universities provide advanced experimental equipment and technical support for medical research. This helps medical students participate in cutting-edge medical research and improve their scientific research capabilities. Collaborative medical research projects with foreign universities allow medical students to gain exposure to internationally advanced medical research concepts and technologies, broadening their international horizons.

3.4. Advantages of clinical practice

With abundant resources from affiliated hospitals and diverse clinical practice opportunities, medical students can benefit from a wide range of clinical experiences. For example, the integration of medicine with sociology, management, and other disciplines enables students to understand the social needs and management models of medical services, cultivating comprehensive medical service capabilities.

3.5. Advantages of social impact and employment

Graduates from comprehensive universities often have a certain advantage in terms of their academic backgrounds during job searches. They can not only engage in clinical medical treatment, scientific research, teaching, and other work in medical and health institutions, but also find employment in other related fields such as medical equipment, pharmaceutical research and development, medical insurance, and health management. This diversified employment landscape provides medical students with broader development opportunities.

4. Cultivation based on job competency: Promoting the integration of basic and clinical sciences

The student-centered teaching model will place new demands on curriculum design and teaching methods. Taking pathology as an example, after achieving the integration of basic and clinical sciences in the curriculum, the pathology department can further advance students' learning from basic to clinical sciences, including the transition from basic pathology to clinical pathology and from pathology to clinical departments. Teachers can initially adopt auxiliary teaching formats such as second classrooms and scientific research innovation teams, gradually transitioning to a longer-term clinical medical program to construct a new teaching model that integrates basic and clinical sciences. Medical students in the basic learning stage can have early exposure to clinical practices, facilitating the two-way integration of basic and clinical knowledge and laying the foundation for cultivating excellent medical talents for clinical practice. For instance, when students learn about diseases of a specific system in pathology courses, they first receive instruction on the basic pathological content of that system and then visit the clinical pathology department to learn the entire diagnostic workflow, including tissue sampling, slide preparation, staining, immunohistochemistry, slide reading, and report issuance. Additionally, students can continue to learn clinically relevant knowledge about a specific case in imaging, laboratory, and clinical departments, and even observe some surgical procedures live or through recordings if conditions permit. This model allows students in the basic science learning stage to have early exposure to clinical practices, listen to medical experts' case interpretations, gain a more comprehensive and profound understanding of diseases, further understand medical professionals and the entire healthcare industry, strengthen their commitment to pursue medicine, and find a suitable professional direction [5].

4.1. Facilitating knowledge understanding and application

Basic medical courses such as anatomy, physiology, and pathology are often highly theoretical, and their integration with clinical practices can help students better understand abstract concepts. For example, when explaining human anatomical structures, combining clinical surgery videos or case studies to demonstrate the location, morphology, and function of different organs can provide students with an intuitive understanding of the importance of anatomical knowledge in clinical settings. In physiology teaching,

analyzing changes in physiological indicators from clinical cases can assist students in understanding the regulatory mechanisms of physiological functions.

4.2. Cultivating clinical thinking skills

Exposing students to clinical cases from the basic medical learning stage onward can guide them to gradually develop clinical thinking skills. Students learn to apply basic medical knowledge starting from clinical manifestations to analyze the etiology, pathogenesis, diagnosis, and treatment methods. Cultivating clinical thinking helps them make quick and accurate judgments in their future clinical work.

4.3. Enhancing learning interest and motivation

Pure theoretical study of basic medical sciences may be perceived as boring and tedious by students. However, when combined with clinical practice, students can witness the application of their learned knowledge in actual medical settings, thereby stimulating their learning interest and motivation. For instance, in pathology teaching, presenting real pathological sections and clinical cases allows students to experience the process of pathological diagnosis firsthand, adding enjoyment to their learning.

4.4. Strengthening practical skills

The integration of basic medical teaching and clinical practice provides students with more opportunities for hands-on experience. Through clinical internships, laboratory practices, and other activities, students can personally experience the workflows and methods of clinical work, enhancing their practical skills and operational abilities.

4.5. Facilitating interdisciplinary integration

There exists a close connection between basic medical sciences and clinical medicine, and integrating teaching can promote interdisciplinary integration. Teachers can guide students to analyze clinical problems from different disciplinary perspectives, cultivating their comprehensive analytical skills and cross-disciplinary thinking.

5. Training program based on job competency

The curriculum design based on job competency needs to break away from traditional teaching models, placing greater emphasis on practice, innovation, and personalization. Firstly, core courses and skills should be identified [6]. These include basic medical knowledge, diagnosis and treatment methods for common diseases, and the use of medical equipment. In this phase, medical educators must not only ensure that students master the necessary knowledge but also cultivate their practical skills and judgment.

5.1. Adopting diversified teaching methods

In basic medical course teaching, the proportion of clinical case teaching should be increased. For example, in pathology teaching, clinical cases such as tumors and inflammation can be introduced to familiarize students with the pathological changes and diagnosis methods of diseases. Clinical case teaching can stimulate students' interest in learning and enhance their clinical thinking and problem-analyzing skills.

5.2. Flipped classroom combined with problem-based learning teaching method

In the flipped classroom model, students preview course content outside of class through online learning, reading literature, watching videos, and other means, further deepening and expanding their knowledge. This model can strengthen students' mastery of medically related theoretical knowledge and improve their learning motivation [7]. Problem-based learning (PBL) originated in the 1960s, expanding from the field of medical education to various disciplinary areas today [8,9]. Experimental comparative analysis has found that combining the flipped classroom with PBL teaching methods can significantly improve students' clinical operation skills, self-learning abilities, and team collaboration skills, and facilitate the understanding of theoretical knowledge. Therefore, integrating the self-learning-focused flipped classroom with the problem-oriented PBL teaching method holds great application value in medical education [10].

5.3. Utilizing modern educational technology

Making full use of modern educational technologies such as multimedia teaching, online teaching, and virtual simulation experiments can enrich teaching methods and improve teaching effectiveness. For example, in human anatomy teaching, three-dimensional virtual simulation software can be utilized to allow students to observe human structures intuitively. In physiology teaching, online teaching platforms can enable students to conduct experiments and self-study online. Modern educational technology can break through the temporal and spatial limitations of traditional teaching, providing students with more convenient and efficient learning methods.

5.4. Incorporating flexibility and personalization

Apart from compulsory core courses, students should be provided with elective options. Additionally, research projects or practical opportunities can be offered to enable students to deeply explore their areas of interest. This approach not only ensures that students master the necessary knowledge and skills but also cultivates their practical skills, innovative spirit, and independent thinking capabilities.

6. Establishing a diversified evaluation system

6.1. Diversified evaluation content

Evaluation should not only include students' mastery of theoretical knowledge but also their comprehensive qualities such as clinical thinking, practical skills, communication skills, and teamwork spirit. For example, in the evaluation of pathology courses, case analysis, experimental reports, group discussions, and other evaluation contents can be added to comprehensively assess students' learning effectiveness and skill levels.

6.2. Diversified evaluation methods

Diversified evaluation methods should be adopted such as exams, homework, experimental reports, classroom performance, internship evaluations, etc., to comprehensively evaluate students' academic performance and overall qualities. At the same time, a combination of student self-evaluation, peer evaluation, and teacher evaluation can be introduced to improve the objectivity and fairness of the evaluation.

6.3. Dynamic evaluation process

A dynamic evaluation process is established to provide timely feedback on students' learning situations

and existing problems, guiding them to adjust their learning methods and strategies. For example, regular classroom tests and homework corrections can be conducted during the teaching process to keep abreast of students' learning progress and mastery level; during the internship, regular internship reports and evaluations can be organized to provide timely feedback on students' internship performance and existing problems.

7. Conclusion and outlook

The teaching reform of basic medical courses in comprehensive universities oriented towards clinical competency is a systematic project that requires the joint efforts of schools, teachers, students, and other parties. By optimizing the curriculum, improving teaching methods, strengthening practical teaching, and establishing a diversified evaluation system, students' clinical competency can be effectively improved, providing a strong guarantee for cultivating high-quality medical talents. In future teaching reforms, we need to continue to explore and innovate, further improve teaching reform plans, enhance teaching quality, and make greater contributions to the development of China's medical and health industry.

Funding

(1) Key Project of the "14th Five-Year" Plan for Heilongjiang Provincial Education Science in 2021 (GJB1421168)
(2) Key Project of the "14th Five-Year" Plan for Heilongjiang Provincial Education Science in 2022 (GJB1422698)
(3) Key Project of the "14th Five-Year" Plan for Heilongjiang Provincial Education Science in 2023 (GJB1423165)
(4) Research Topic on Higher Education of Heilongjiang Provincial Association of Higher Education (23GJYBC057)
(5) Special Project for New Medical Education in Jiamusi University (2023XYK-20)
(6) "Dongji" Academic Team of Jiamusi University (DJXSTD202405)
(7) Heilongjiang Province Postgraduate Quality Course High-Quality Construction Project (HLJYJSZLTSGC-YJSJPKC-2022-082)

Disclosure statement

The authors declare no conflict of interest.

References

[1] Liu H, Shen Y, Qiu S, et al., 2024, Some Thoughts on the Implementation of Discussion Teaching Methods in the Context of the Five-Year Reform of Clinical Medicine at Zhejiang University School of Medicine. China Higher Medical Education, (7): 15–18 + 23.

[2] Hu Z, Liu D, 2024, Exploration of Job Competency in Clinical Medicine Postgraduate Training. Continuing Medical Education, 38(8): 144–147.

[3] Kwan BYM, Mbanwi A, Cofie N, et al., 2021, Creating a Competency-Based Medical Education Curriculum for

Canadian Diagnostic Radiology Residency (Queen's Fundamental Innovations in Residency Education)-Part 1: Transition to Discipline and Foundation of Discipline Stages. Can Assoc Radiol J, 72(3): 372–380.

[4] Castellanos-Ortega A, Broch MJ, Palacios-Castaneda D, et al., 2022, Competency Assessment of Residents of Intensive Care Medicine Through a Simulation-Based Objective Structured Clinical Evaluation. A Multicenter Observational Study. Med Intensiv (Engl Ed), 46(9): 491–500.

[5] Liu Y, Xu Z, Wang D, et al., 2022, Teaching Practice and Reflections on the Basic-Clinical Integration Model of Pathology. Basic Medical Education, 24(11): 833–837.

[6] Van Melle E, Hall AK, Schumacher DJ, et al., 2021, Capturing Outcomes of Competency-Based Medical Education: The Call and the Challenge. Med Teach, 43(7): 794–800.

[7] Bazrafkan L, Panahian R, Zarifsanaiey N, 2023, The Effect of Flipped Approach in Teaching Critical Respiratory Care Among Nurses During the COVID-19 Era. BMC Research Notes, 16(1): 44.

[8] Lyberg-Ahlander V, Lundskog M, Hansson L, 2014, Experiencing the Role of PBL Tutor. Clin Linguist Phon, 28(1–2): 36–46.

[9] Wu L, Jiang B, Zhou L, et al., 2024, Exploration and Practice of Problem-Oriented Environmental Science Teaching Model. Chinese Higher Medical Education, (6): 75–76 + 93.

[10] Li Y, Bai X, Zhang X, 2023, Application of Flipped Classroom Combined with PBL Teaching Method in the Teaching of Respiratory Intensive Care Unit Nursing. Journal of Contemporary Educational Research, 7(10): 46–51.