

Research on the critical thinking training strategies of college students from the perspective of educational psychology

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Abstract: In recent years, with the continuous expansion of the college enrollment scale, health system reform and the deepening of medical insurance system reform, medical education standing on a new historical node, its future development path and the social expectations of medical students, has become one of the important issues to think deeply. In the medical field, critical thinking is directly related to the scientificity of medical decision-making and the safety and effectiveness of patient treatment. As a key link to improve the comprehensive quality of medical students, psychological education plays a particularly significant role in shaping students to keep calm and objective attitude in the face of medical challenges, which provides a solid and reliable psychological support background for the cultivation of medical students' critical thinking.

1. Introduction

Critical thinking is a kind of ability to evaluate and continuously optimize the thinking process according to the established standards, which reflects the rationality of thinking and the depth of reflection. Critical thinking is clearly listed as one of the core basic qualities of medical students in the International Standards of the World Medical Education Federation for its independent thinking, rational analysis and rigorous truth-seeking. However, the current university education still faces many challenges in training the critical thinking. On the one hand, many students lack the ability to think independently when facing complex problems and tend to accept existing knowledge without questioning. On the other hand, the traditional teaching mode often focuses on a single knowledge indoctrination, but to some extent, it ignores the training of students' thinking ability.

The cultivation of critical thinking ability is an important aspect of the higher education reform in the 21st century [1]. As the main force in the future clinical medical field of medical students, cultivating their critical thinking can not only enhance the scientific rigor and moral ethics of their medical decisions, but also help them to remain tough and calm in the face of complex challenges. Educational psychology takes students' learning psychology as the core content of the research, and

requires that in the process of practical teaching, the selection of teaching content and teaching methods are required to conform to the law of students' learning psychology and psychological development mechanism, and then lay a solid foundation for students' sound personality shaping, and promote the comprehensive development of students in an all-round way [2]. As a subject of exploring the development of learners' cognition, emotion and behavior, educational psychology can provide theoretical support and practical guidance for the training of critical thinking. By analyzing the development mechanism of critical thinking from the perspective of educational psychology, it is of great theoretical and practical significance to deeply explore the teaching strategies that can correctly cultivate critical thinking. The aim of this study is to explore the critical thinking training strategies of college students from the perspective of educational psychology, optimize the training strategies, and provide a theoretical basis for medical students' teaching reform and formulate corresponding educational strategies.

2. Definition and theory of critical thinking

Critical thinking is widely recognized as the basic ability of citizens to participate in social activities, and plays a vital role in the success of individuals in education, occupation and other fields. Critical thinking is defined as a kind of judgment with a clear purpose, which covers multiple dimensions of [3], including analysis, understanding, evaluation, reasoning and interpretation, involving the ability to analyze, evaluate and integrate information. Its theoretical basis covers many fields: logical theory emphasizes the importance of logical reasoning and the structure and effectiveness of analytical argument; constructivism learning theory encourages learners to actively participate in discussion and explore different views to deepen understanding; social-cultural theory emphasizes the influence of social and cultural background on individual thinking, and points out that critical thinking not only reflects individual ability, but also is closely related to society and culture.

3. Relations between educational psychology and critical thinking

Medical majors have their particularity in China, such as undergraduate study is longer than other majors, a wide coverage of courses and higher requirements for comprehensive literacy of medical students. It is difficult for medical students to firmly identify the identity of self-value in the long learning cycle, and psychological education plays an important role in maintaining the self-value identity of medical students. One of the main contents of educational psychology is to maintain students' mental health. Mental health refers to the people when engaged in all social activities, the inner world and objective external world can achieve a harmonious state, and can adapt to the change of social environment, to constantly improve their personality, improve themselves, realize their life value, get positive emotional experience and recognized their [4]. As a thinking tendency that needs to be supported by correct standards, criticism has a requirement for self-worth identity in its natural attributes. Self-value identification is an important part of medical students' outlook on life, which supports medical students not to lose their confidence and rationally use clinical knowledge and skills in the face of complex events. If unable to firmly identify with self-worth, critical thinking is likely to develop into a paradox in practice and evaluate things using wrong criteria. When the subject of such a situation is medical students, more complex medical ethical events and life safety events are often involved. To sum up, self-value identity is one of the prerequisites for the effective establishment of criticism. While using critical thinking to solve complex events, medical students should also strengthen their identity of self-value. The realization of this process must rely on the rational use of educational psychology.

4. Current situation of critical thinking cultivation in current education

4.1. Teachers have insufficient understanding of the cultivation of critical thinking

In medical schools, most teachers also act as clinicians, not only dealing with the daily work of the hospital, but also undertaking teaching and research tasks. The heavy work burden makes it difficult for them to spare enough time and energy to explore the teaching methods deeply, especially the training strategies for students' critical thinking skills [5]. Although some teachers are interested in improving students' critical thinking, the learning and mastery of advanced training strategies are not systematic and deep enough, so it is difficult to achieve the ideal teaching effect [6]. The teachers in some medical schools lack the teaching experience and ability of critical thinking, and it is difficult to effectively guide medical students to form critical thinking and trace back to the source. This is the lack of attention to critical thinking in teacher training. As a result, some teachers also lack critical thinking. If teachers fail to fully grasp the tools and methods of critical thinking, it is difficult to set a positive example for students in daily words and deeds. In this case, medical students are not only difficult to obtain effective critical thinking training, but also may stray into the wrong thinking because of the lack of positive guidance, and it is difficult to cultivate the spirit of independent thinking and brave questioning.

4.2. Teaching mode is not conducive to the exercise of critical thinking

The knowledge structure of medical students often presents a relatively single feature, and the lack of extensive interdisciplinary knowledge support and comprehensive analysis ability, which reflects the defects of the existing teaching contents and methods. This defect makes medical students particularly prominent in the face of complex medical problems, making it difficult for them to flexibly use a multi-disciplinary perspective for profound and comprehensive critical thinking. At the same time, the single teaching forms of some medical schools, such as: traditional teaching is difficult to stimulate medical students' learning interest and initiative, which is not conducive to the formation of critical thinking; Teaching problems such as excessive confirmatory experiments and lack of comprehensive design experiments also limit the opportunities for students to exercise critical thinking in practice.

4.3. The restriction of traditional education methods on the development of critical thinking

In the context of long-term exam-oriented education, medical students face a complex medical knowledge system and rely on mechanical memory to deal with exams. This learning method limits their ability to think, analyze and question problems [7]. Students tend to think that authority is unquestionable, rarely exploring the views of teachers or experts, and even less questioning authority. Medical students show the lack of depth of thinking and the lack of exploration spirit in the pursuit of truth. While learning traditional medical knowledge, students may fall into the shackles of some adverse thinking, such as the blind worship of famous doctors and excessive superstition of classical medical literature. This absolute reliance on specific medical theories or opinions, as well as the rejection of voices questioning these theories and opinions, greatly limits the development of students' critical thinking.

5. Critical thinking training strategies for college students

5.1. Strategies from the perspective of educational psychology

Strengthen the attention to medical students' mental health education, and lay a solid foundation for critical thinking education. The basic information system of medical students' mental health should be established, the mental health education of medical students should be included in the compulsory course system, and the mental health lectures and activities should be held regularly to enhance the medical students' self-cognition and emotional management ability. At the same time, the psychological consultation service system of medical colleges and universities is established to provide personalized counseling and counseling for students, and timely intervene in the psychological problems of medical students. Using the resources of the network platform, mental health education columns and forums are set up to promote positive communication and experience sharing among medical students, create a positive cultural atmosphere in medical schools, and lay a foundation for consolidating critical thinking education.

Studies have revealed that the psychological pressure of medical students is of medium level, among which internship pressure is identified as the most important stressor, followed by academic pressure, social pressure ranks third, while career pressure is at the end of [8]. The relief of medical students' psychological pressure depends on the correct psychological education, which is an important part of the early warning and intervention mechanism of psychological pressure crisis for medical students. Guided by psychological education, medical colleges and schools have designed a series of measures to relieve the psychological pressure for medical students. Psychological pressure as a double-edged sword, under a certain degree of high pressure index can effectively promote the improvement of medical students' clinical skills and medical students stress ability, but psychological pressure once the threshold, can make medical students have great negative emotions, not normal thinking using clinical knowledge, leading to the occurrence of malignant events. Critical thinking, as a thinking tool, allows medical students to follow in the thinking of complex events. Too strong psychological pressure will often play a negative factor that hinders medical students from thinking normally, so that medical students cannot use critical thinking normally. Educational psychology, as an educational category, educational psychology covers internship, study, social interaction and career selection, etc. It has a certain basic research and practice for various sources of psychological pressure for medical students. Therefore, psychological education can be used as a cradle of thinking, making medical students adapt to the psychological pressure under different indicators and different situations, think calmly, and use critical thinking to solve difficult problems.

Take students' mental health as the guide to improve the teaching quality of students' critical thinking. Teachers play an important role in teaching, under the premise of students' mental health information, encourage clinical medicine teachers and psychology teachers cooperation, into case teaching, on the one hand, widely used real case in teaching, guide students analysis, evaluation, reasoning and decision making and a series of process, improve students' classroom participation, make the students to mental health education and critical thinking form a preliminary and profound understanding and concept. On the other hand, more challenging cases are encouraged to encourage students to have in-depth thinking and discussion, so as to deepen students' understanding and application of critical thinking.

5.2. Application in practice

The curriculum training system is the key guarantee to realize the teaching goal. In order to effectively cultivate students' critical thinking ability, it is necessary to establish a relatively perfect curriculum training system to ensure that students can be systematically trained and guided by [9].

Taking the mental health education model as a new idea, we should improve the critical thinking teaching system. An interdisciplinary exchange platform will be set up to encourage the integration of medicine, psychology, philosophy, ethics and other psychological fields to broaden the horizons of medical students and promote diversified thinking.

Problem-based teaching method (PBL) is to put students in the main position of students, to ask problems and solve problems as the center, through the growth of skills through practice, more help students to understand and integrate ideological and political ideas [10].

5.3. The effectiveness of the strategy

The complex and changeable medical field requires medical students to have a keen insight into a comprehensive review of various potential causes. Clinical reasoning and decision-making are key points in medical practice, requiring flexible application of theoretical knowledge to cases and comprehensive consideration of patient information [11]. Based on educational psychology, with the help of critical thinking, it helps medical students to remove information representation to reach the essence of the problem, improve the accuracy of reasoning and the rationality of decision-making, so that medical students can constantly question, analyze, evaluate and reconstruct their cognitive framework, and achieve the purpose of reducing the risk and probability of medical accidents. At the same time, medical students who have received psychological education have more critical thinking than those who have not. They can self-drive, actively make up for deficiencies, broaden learning boundaries, closely follow academic frontiers, actively read the latest medical literature, attend academic conferences and training courses to constantly enrich themselves. At the same time, it also promotes the overall progress of medical education, faces the challenges with an open review attitude, and draws the blueprint for the future of medicine [12].

6. Conclusion

6.1. Impact of critical-thinking training strategies on educational practice

The implementation of critical thinking training strategies for college students based on the perspective of educational psychology has profound significance for the reform of teaching methods, curriculum design and teacher role. First of all, the cultivation of critical thinking requires teachers to change from traditional knowledge imitators to thinking guides, so as to receive more heuristic and discussion teaching in class, and stimulate students' ability to take active thinking and questioning. Secondly, curriculum design needs to be adjusted around the improvement of critical thinking ability, and provide students with diversified thinking training opportunities by introducing teaching activities such as problem-oriented learning and case analysis. In addition, the application of this strategy also promotes the improvement of students' self-learning ability, and helps students to solve problems independently in the future. Therefore, these training strategies not only deepen the practical application of educational psychology, but also have an important impact on the reform of the current higher education system.

6.2. Limitations of the critical-thinking training strategies

Although the strategies under the guidance of educational psychology have significant effects on the cultivation of critical thinking, they still have some limitations. First of all, the training time of critical thinking is long and it is relatively complex, and it is difficult to achieve results in the short term. Especially in the context of widespread exam-oriented education, many teachers, students and even values are more inclined to improve their academic performance intuitively, but ignore the

training of deeper thinking ability. Secondly, the implementation of this strategy also increases the requirements on teachers, requiring teachers to have strong professional quality. If teachers lack critical thinking teaching experience or fail to fully understand educational psychology theory, it may lead to poor training effect and cannot open a gap with ordinary teaching. In addition, individual differences among students cannot be avoided. This strategy is taught as a whole, which cannot ensure that all students can achieve significant improvement in the same teaching environment, and thus cannot achieve the expected training effect. Therefore, despite the theoretical and practical value of the above strategies, their application effect still needs to be further optimized and explored.

References

- [1] Zhang Yaqing, Lisa Li, Wu Ping & Chen Ying. (2009). *Investigation and analysis of the critical thinking ability of medical students*. *Journal of Shanghai Jiao Tong University (Medical edition)* (07), 869-872.
- [2] Wu Jingyun. (2024-09-03). *Research on the innovation and development of mental health education for college students under the background of educational psychology*. *Chongqing Science and Technology News*, 004.
- [3] Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction (The Delphi Report) [M]*. Millbrae: California Academic Press: 13-14.
- [4] Kong Chan. (2024). *Analysis and countermeasures of college students' mental health education*. *Shanxi Youth*, (7), 187-189.
- [5] Deng Shengwei. (2022). *On the cultivation strategy of critical thinking in primary school*. *The Electronic Magazine of the New Education Era (Teacher's edition)*, (32), 10-12.
- [6] Zang Kai. (2015). *Research on the cultivation of critical thinking ability among medical students*. *Science and Technology Innovation Guide*, 12 (26), 151-152.
- [7] Gao Pengru. (2017). *The current situation of medical students' critical thinking ability and their influencing factors*. *Everyone is healthy*, (24), 269.
- [8] Reddy S , Molleti M , Li L .*Impacts of Acute Psychological Stress on the Emotions of Individuals with Early Life Stress[J].Alpha Psychiatry*, 2024, 25(4).DOI:10.5152/alphapsychiatry.2024.231435.
- [9] Li Bocong, Tan Yixiao. *Promote the cultivation of medical students' critical thinking ability through the construction of ideological and political courses [J]*. *Heilongjiang Education (Research and Evaluation of Higher Education)*, 2024, (01): 41-43.
- [10] Luo Yanxia, Hu Huijuan, Shao Yumei, et al. *Application of PBL teaching method in hospital infection training for practice nurses in ICU [J]*. *Nursing Research*, 2022, 36 (16): 3006-3008.
- [11] Persky, A. M., Medina, M. S., & Castleberry, A. N. (2019). *Developing critical thinking skills in pharmacy students*. *American Journal of Pharmaceutical Education*, 83(2), 7033.
- [12] Souza-Talarico, Juliana Nery, Chesak S , Elizalde N ,et al.*Exploring the interplay of psychological and biological components of stress response and telomere length in the transition from middle age to late adulthood: A systematic review [J]*. *Stress & Health: Journal of the International Society for the Investigation of Stress*, 2024, 40(4).DOI:10.1002/smi.3389.