

EDITORIAL

Approaches and Barriers to Cultivating Critical Thinking Skills for Effective Clinical Decision Making

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INTRODUCTION:

Clinical decision-making is a complex process that involves gathering information, analyzing data, making informed judgments, and taking appropriate actions for a patient's care. Critical thinking (CT) is a vital component of this process, as it enables healthcare professionals to evaluate information, identify biases and assumptions, and make informed decisions⁽¹⁾. It requires careful consideration of multiple factors, including the patient's age, gender, medical history, physical exams, and diagnostic test results, health status, lifestyle, and even preferences, to develop a diagnosis and treatment plan. In recent years, there has been a growing recognition of the importance of promoting CT skills in medical education, due to the explosion of medical information^(1,2).

CT refers to a set of advanced cognitive skills employed by students. It involves the use of personal perspectives and approaches, rather than blindly accepting the judgments, attitudes, and information of others without critical evaluation⁽³⁾. It is a relatively new philosophy founded on the principles of critical theory by educators such as Paulo Freire, Henry Giroux, Peter McLaren, Michael Apple, and Douglass Kellner. Wisdom, critique, and interpretation are valued educational aims in this form of education. The use of memory and old information is reduced in this type of instruction, and learners can examine, evaluate, and understand the material. As a result, the first purpose of medical education in this age of multiple information explosion is to develop critics and intelligent students to tackle the changing society and overcome all the barriers to its implementation^(4,5). The aim of this review article is twofold: firstly, to investigate

teaching and learning strategies that have proven effective in promoting CT in Clinical decision-making and secondly, to explore both the barriers and motivators to the application of CT in medical education.

KEY WORDS: Critical thinking; Clinical; Medical education

CT Teaching and Learning Strategies:

Problem-Based Learning (PBL): PBL is a student-centered teaching style in which real-world problems are presented to students and then followed by group discussions and self-directed learning activities to address the issue and motivate them to develop solutions. This approach encourages students to analyze information, and promotes active learning, CT, teamwork, and communication skills, which are all essential in medical practice and aid in making informed decisions. PBL has been shown to be effective in promoting CT skills, and it is often used in conjunction with other teaching methods to provide a comprehensive and integrated learning experience for medical students and residents^(3,6).

Case-Based Learning (CBL): CBL is another student-centered teaching method that presents students with clinical cases and challenges them to diagnose and manage the patient. This approach promotes CT and clinical reasoning skills by requiring students to analyze information, identify biases and assumptions, and make informed decisions. It also promotes active learning, collaboration, and peer-to-peer teaching. CBL has been shown to be effective in improving learners' knowledge, skills, and confidence in clinical practice^(4,7).

Team-Based Learning (TBL): TBL is a collaborative learning approach that involves small

groups of students working together to solve problems and make decisions. TBL typically begins with individual assessments to ensure that all students have a baseline understanding of the topic. The group then discusses the case study and works together to arrive at a consensus about the best approach to managing the patient. TBL encourages active participation, peer-to-peer teaching, and the development of effective teamwork skills. It also provides immediate feedback to students, enabling them to identify areas for improvement and reinforcing their strengths. TBL has been shown to be effective in improving students' knowledge, problem-solving skills, and teamwork abilities. It is often used in combination with other teaching methods to provide a comprehensive and integrated learning experience for medical students and residents^(6,8).

Simulation-Based Learning (SBL): It is a teaching method that uses simulated environments to provide learners with realistic clinical experiences without the risk of harm to patients. SBL can take many forms, such as computer simulations, mannequin-based simulations, and virtual reality simulations. It is designed to replicate real-world scenarios and provide learners with an opportunity to practice clinical skills and decision-making in a safe and controlled environment. This approach prioritizes patient safety, and provides students with the opportunity to practice CT and decision-making skills in a safe and controlled environment. SBL is particularly useful for teaching complex procedures, communication skills, and teamwork, as well as for providing hands-on practice in the use of medical equipment and technologies. SBL also provides immediate feedback to learners, enabling them to identify areas for improvement and reinforcing their strengths. SBL has been shown to be effective in improving learners' knowledge, skills, confidence, and patient outcomes⁽⁹⁾.

Factors affects CT implementation in medical curriculum

Successfully implementing CT education requires a range of factors to be in place. Firstly, a clear understanding of what CT is and why it is essential should be provided to both students and educators. This understanding includes recognizing the value of asking questions, evaluating evidence, and drawing reasoned conclusions to improve patient outcomes. It is crucial to recognize the link between CT skills and successful medical practice

and communicate this to students and educators alike^(5,10).

Secondly, a suitable curriculum that emphasizes CT skills should be developed. The curriculum should include opportunities for students to apply their skills in real-world scenarios, such as case studies, patient encounters, and problem-based learning. Students should have access to a range of resources, including textbooks, digital learning resources, and interactive simulations, to enhance their learning experience⁽¹¹⁾.

Thirdly, experienced educators with expertise in CT should be available to provide high-quality instruction and support to students. This support includes providing feedback on CT assignments, facilitating discussions, and guiding students through the problem-solving process. In addition, medical professionals who are skilled in CT can be involved in teaching and curriculum development to provide valuable insights and expertise⁽¹⁰⁾.

Fourthly, appropriate resources and technology should be made available to support CT education. This includes interactive learning resources, clinical simulations, and collaborative learning tools. Technology can enable students to engage in realistic simulations, experiment with different solutions to problems, and work collaboratively with their peers⁽¹²⁾.

Finally, evaluation and assessment strategies should be in place to monitor progress and identify areas for improvement. This evaluation should not only assess the development of CT skills but also the effectiveness of the teaching and learning process. The results of the evaluation can inform changes to the curriculum, teaching methods, and resources, ensuring ongoing improvement and refinement^(11,12).

Barriers of CT in medical students' curriculum

While PBL, CBL, TBL, and SBL are effective teaching methods and enhance CT, they may also face some barriers that can affect their implementation and effectiveness. Some of the common barriers include:

- 1- Faculty resistance: Faculty may resist the adoption of these methods due to their traditional teaching methods and lack of experience with these new teaching methodologies.
- 2- Resource limitations: SBL and TBL require access to specialized equipment, materials, and technology, which can be expensive and may not be available in all educational settings.

- 3- Student resistance: Some students may struggle to adapt to the collaborative and self-directed learning environment of PBL, CBL, TBL, and SBL, preferring more traditional didactic methods.
- 4- Time constraints: PBL, CBL, TBL, and SBL require more time for preparation, implementation, and assessment than traditional teaching methods, which can be a barrier in time-constrained curricula. Moreover, the vast amount of medical information available can be overwhelming, leading to a reliance on preconceived notions rather than engaging in critical analysis.
- 5- Evaluation challenges: Assessment of PBL, CBL, TBL, and SBL can be complex, requiring specific tools and strategies to evaluate teamwork, problem-solving, and communication skills.
- 6- Limited generalizability: The transferability of skills and knowledge learned in PBL, CBL, TBL, and SBL to real-world clinical practice may be limited by the context-specific nature of the learning environment.

Addressing these barriers can help promote the successful implementation and effectiveness of PBL, TBL, and SBL in medical education ^(10, 13, 14).

CT Teaching learning motivations

Motivating medical students and teachers for a CT approach can be achieved through several strategies. Firstly, creating a learning environment that emphasizes CT through interactive and engaging teaching techniques can foster interest and enthusiasm among students. Secondly, providing opportunities for medical students to apply their CT skills in real-community based clinical scenarios, such as through problem-based learning or clinical case studies ^(10, 11). Thirdly, involving medical professionals with expertise in CT in teaching and curriculum development can enhance the quality of education and provide valuable insights to students. Fourthly, encouraging students to reflect on their own learning process and identify areas for improvement can help motivate them to develop their CT skills. Finally, recognizing and rewarding CT achievements can boost motivation among students and teachers alike, inspiring them to continue striving for excellence in this area ^(9, 15).

Role of Technology in CT application:

Technology can play a significant role in promoting CT in medical education by providing students with access to a wide range of resources, opportunities to practice their skills in realistic scenarios, and engaging and interactive learning experiences. The following are some examples:

- 1- Online Learning Resources: With the increasing availability of online learning resources, medical students can access a wide range of educational material to develop their CT skills. Online resources such as medical journals, e-books, webinars, and podcasts provide students with the opportunity to learn from experts in the field, collaborate with peers, and explore different perspectives on medical issues.
- 2- Educational technology, such as virtual reality simulations, can provide a safe and realistic environment for students to apply their CT skills in real-world scenarios.
- 3- E-learning Platforms: E-learning platforms can provide interactive and engaging content to help students develop CT skills. These platforms use videos, quizzes, and other interactive elements to encourage students to engage with the material and develop their analytical skills.
- 4- Mobile Apps: Mobile apps can provide students with access to medical information and resources on-the-go. They can also include interactive elements, such as quizzes and games, to help students develop their CT skills.
- 5- Virtual Reality: Virtual reality technology provides students with a realistic and immersive environment to learn CT skills. Students can interact with virtual patients, diagnose medical conditions, and practice clinical decision-making in a safe and controlled environment ^(11, 13, 16).

CONCLUSION:

Clinical decision-making is a complex process that requires CT skills for healthcare professionals to analyze data, identify biases, and make informed judgments for patient care. Teaching and learning strategies such as PBL, CBL, TBL, and SBL have proven to be effective in promoting CT skills and are often used in conjunction with each other to provide a comprehensive and integrated learning experience for medical students and residents. However, successfully implementing CT education requires a clear understanding of what CT is, a

suitable curriculum that emphasizes CT skills, experienced educators with expertise in CT, and institutional support. Overcoming the barriers to CT education in medical education, including the lack of institutional support, the lack of trained faculty, and insufficient time and resources, requires motivation to develop critics and intelligent students to tackle the changing society. Overall, CT is essential in medical practice, and healthcare professionals must continually strive to develop and improve their CT skills to provide the best possible care for their patients to ultimately improve their outcomes.

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