

Understanding Critical Thinking to Create Better Doctors

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Abstract

Medical students master an enormous body of knowledge, but lack systematic problem solving ability and effective clinical decision making. High profile reports have called for reforms in medical education to create a better generation of doctors who can cope with the system based problems they would encounter in an interdisciplinary and collaborative environment and make better reasoned decisions for quality patient care. To achieve this critical thinking is at the very heart of development of new medical knowledge. Critical thinking (CT) can be defined as the ability to identify and analyse problems as well as seek and evaluate relevant information in order to reach an appropriate conclusion. Medical academics and practitioners have raised concerns about the low levels of critical thinking and stress the need for fostering critical thinking among medical practitioners. This article attempts to provide a conceptual analysis of critical thinking with reference to medical education along with measures to foster critical thinking through relevant teaching learning and assessment methods.

Key words: Critical thinking, medical education, quality patient care, fostering critical thinking.

Introduction

In the 21st century, students must think their way through abstract problems, work in teams, distinguish good information from bad, and be multilingual and globally/environmentally sensitive so that they can be more effective in their disciplines. These are the same characteristics expected of today's medical students also.[1] Doctors are expected to take effective decisions in well defined and ill defined medical emergencies.

However, when they face undefined medical emergencies they are unable to take effective clinical decisions and that leads to untoward incidents. One among the many reasons for this is a lack of critical thinking skills among doctors. It has been reported that critical thinking should be fostered at grassroots level among the medical students which will promote better decision making when they eventually practice.. The absence of an apprenticeship model of education and a lack of emphasis on critical thinking and on acquisition of skills and competencies has resulted in producing doctors who are incapable of independent practice.[2]

Health care is fallible and prone to diagnostic and management errors. Approximately one third of patient problems arise due to diagnostic errors. Part of the solution lies in improving the diagnostic skills and critical thinking abilities of physicians as they progress through medical school and residency training. [1] The medical school must teach the principles of scientific method and evidence-based medicine, including analytical and critical thinking, throughout the curriculum. [3] Health care education has emphasized critical thinking as an essential skill for more than 50 years. [4] Critical thinkers exhibit confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open mindedness, perseverance, and reflections as their habits of mind. The global minimum standards for medical education puts forward the essential components of medical education which lists critical thinking and research as an important component. [5] This paper attempts to present a conceptual analysis of critical thinking with reference to medical education.

What is Critical Thinking?

There are several key definitions for critical thinking to consider. The American Philosophical Association (APA) defined critical thinking as purposeful, self-regulatory judgment that uses cognitive tools such as interpretation, analysis, evaluation, inference, and explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations on which judgment is based. [6]

“Critical thinking is the ability and willingness to assess claims and make objective judgments on the basis of well-supported reasons. It is the ability to look for flaws in arguments and resist claims that have no supporting evidence. It also fosters the ability to be creative and constructive to generate possible explanations for findings, think of implications, and apply new knowledge to a broad range of social and personal problems.” [7]

Critical thinking, commonly referred to as rational/logical thought, has its birthplace in philosophy. Thus, critical thinking is a cognitive skill that can be taught and learned. It is assumed that critical thinkers make better decisions, are better problem solvers and are professionally more competent. [8]

The simplest definition is offered by Beyer (1995): “Critical thinking means making reasoned judgments”. In other words, critical thinking is a disciplined manner of thought that a person uses to assess the validity of something (statements, news stories, arguments, research, etc.). [9]

Characteristics of Critical Thinking

Wade (1995) has identified eight characteristics of critical thinking. [10] Critical thinking involves asking questions, defining a problem, examining evidence, analyzing assumptions and biases, avoiding emotional reasoning, avoiding oversimplification, considering other interpretations, and tolerating ambiguity. Dealing with ambiguity is also recognized as an essential part of critical thinking. Ambiguity and doubt are a necessary and even a productive part of the critical thinking process. [11]

Another characteristic of critical thinking identified by many sources is metacognition. Metacognition is thinking about one’s own thinking. More specifically, “metacognition is being aware of one’s thinking as one

performs specific tasks and then using this awareness to control what one is doing”. [12]

Beyer (1995) elaborately explains the essential aspects of critical thinking. [9] They are:

Dispositions: Critical thinkers are skeptical, open-minded, value fair-mindedness, respect evidence and reasoning, respect clarity and precision, look at different points of view, and will change positions when reason leads them to do so.

Criteria: One must apply criteria to think critically and need to have conditions that must be met for something to be judged as believable.

Argument: Is a statement or proposition with supporting evidence. Critical thinking involves identifying, evaluating, and constructing arguments.

Reasoning: The ability to infer a conclusion from one or multiple premises. To do so requires examining logical relationships among statements or data.

Point of View: The way one views the world, which shapes one’s construction of meaning. In a search for understanding, critical thinkers view phenomena from many different points of view.

Procedures for Applying Criteria: Other types of thinking use a general procedure. Critical thinking makes use of many procedures. These procedures include asking questions, making judgments, and identifying assumptions.

Steps in critical thinking

Health professionals use critical thinking skills when they reflect on knowledge derived from other interdisciplinary subject areas in order to provide a holistic health care to their patients. [13] It is believed that a critical thinker goes through a series of cognitive steps: [14]

1. gathers information from all senses, verbal and/or written expressions, reflection, observation, experience and reasoning;
2. raises vital, clearly defined questions and problems;
3. gathers and assesses relevant information;
4. uses abstract ideas that are interpreted and used effectively;

5. comes to well-reasoned conclusions and solutions;
6. tests outcomes against relevant criteria and standards;
7. uses alternative thought strategies according to task/needs;
8. evaluates all assumptions, implications, and practical consequences; and
9. communicates effectively with others in generating solutions to complex problems.

How critical thinking can help medical students?

Critical thinking helps healthcare professionals in the following ways:[15-19]

- Avoid medical/clinical errors
- Identify better alternate options for diagnosis and treatment.
- Increases productivity
- Better clinical decision making
- Work in resource limited settings
- Quality thinking and quality work output
- Brings in innovation through creativity
- Avoid litigations
- Develops confidence
- Helps to climb the leadership ladder
- Get higher grades.
- Understand the subjects better.
- Succeed in one's career.
- Learn throughout the life.

Can critical thinking be taught?

Oliver & Utermohlen (1995) see students as too often being passive receptors of information. Through technology, the amount of information available today is massive. Students need a guide to weed through the information and not just passively accept it. Students need to “develop and effectively apply critical thinking skills to their academic studies, to the complex problems that they will face, and to the critical choices they will be forced to

make as a result of the information explosion and other rapid technological changes”. [20]

One of the characteristics of critical thinking is questioning. It is important to teach students how to ask good questions, to think critically, in order to continue the advancement of the fields we are teaching. [21]

Teaching Strategies to Help Promote Critical Thinking

Effective learning involves providing students with a sense of progress and control over their own learning. This requires creating a situation where learners have a chance to try out or test their ideas. This testing is ideally accomplished by connecting students' ideas to concrete experience and that's where the “active” part of the learning comes in. [22,23] Active learning involves providing opportunities for students to meaningfully talk and listen, write, read, and reflect on the content, ideas, issues, and concerns of an academic subject. [22] There are four broad categories of learning strategies that one might use in an active learning classroom. They are individual activities, paired activities, informal small groups and cooperative student projects. The choice of these will depend on the size of the class, available physical space, objectives of the class, the amount of time the teacher can devote to the activity, and the comfort level of the teacher with the strategy. The benefits of active learning are widely acclaimed in higher education. There is some research evidence that this approach supports critical thinking and problem solving which are essential determinants of quality medical education. [22,24] There are a wide range of learning strategies that promote critical thinking such as concept mapping, collaborative writing, think-pair-share strategy, brain storming, one minute paper, problem based learning, team based learning, case based instruction, panel discussion, peer learning, simulation, etc. [21,22,24,25] The Socratic method of teaching has been suggested as one of the goal oriented method that promotes critical thinking because it is more participatory, focused and structured. The basic concept is that students will be able to learn better if they are subjected to active learning environments which also encourage learners to take responsibility for their learning.

Assessment of critical thinking

Assessment drives learning and it is applicable for promoting critical thinking among medical students. For assessing the critical thinking abilities of medical students it is important to establish clear criteria for assessment. The outcomes of the activities suggested in this article for fostering critical thinking can be used as a criterion for assessing critical thinking. There are various methods of formative assessment of critical thinking among the learners. The case study method presents the person being assessed with a scenario that describes a certain situation. The person being assessed should be given questions to help them explore their own problem-solving, prioritization, ethical responses, and assessment of the scenario. Case studies can be purchased or created by the assessor. [10] Exemplars can be an impactful self-reflection tool. The exemplar method asks the person being assessed to write or tell about a situation. The situation can be one he/she may have had or one that he/she may one day experience. In the reflection groups method, the learners are given opportunity to reflect on their experience after a clinical encounter. This will make them to think critically about their experience and frame strategies for better performance. [26] A number of critical thinking skills inventories and measures have been developed such as Watson-Glaser Critical Thinking Appraisal, Cornell Critical Thinking Test, California Critical Thinking Disposition Inventory, California Critical Thinking Skills Test, Health Science Reasoning Test. These tests help the teachers and researchers to assess the critical thinking, attitude towards critical thinking and the reasoning ability of learners. [8, 26, 27]

Conclusion

In recent times, there has been increasing recognition that medical education must focus more on the higher order thinking processes which is required to encounter the emerging challenges in medical education. Higher order thinking has become one of the essential characteristic of future health care professionals and an essential attribute of medical professionalism. Hence, knowing and thinking about critical thinking has become the need of hour and explore the avenues for its application in medical education through appropriate means.

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