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## LETTER to EDITOR

### A Revolution in Medical Education: Are we ready to apply Artificial Intelligence?

#### Dear Editor;

Near 66 years ago, the term artificial intelligence (AI) was developed by John McCarthy in which he defined a machine that could intelligently think and perform instead of man. Today AI is growing rapidly and surrounds many aspects of human life, including education. Whether developed countries have been applied AI in their educational processes and expanded it greatly, developing countries are going to implicate this interesting mechanical intelligence in their learning and training fields (1). Moreover, since medical education is a lifelong process from undergraduate to postgraduate and beyond, in which both trainers and trainees must be updated continuously, AI can be involved in many parts of medical education, including curriculum, learning, and assessment (2). Considering the features and benefits of AI in medical education, it seems that this technology can help to achieve the lofty goals of teaching and learning in medical sciences; however, the main question is what are the limitations and obstacles to apply artificial intelligence in the Iranian medical education system?

From a viewpoint, the first obstacle in applying AI in medical education is professionals' and medical educationalists' insight about shifting medical education and curriculum from "Knowledge acquisition" to "Knowledge management and communication" (3). In detail, the rapid growth of the knowledge and data in medicine makes learners to be updated every moment, although it seems impossible, but AI as an intelligence machine can gather, communicate, think, analyze, interpret, and present huge data to the users (4, 5). Despite this aspect of applying AI in medical education seems valuable and increases the accuracy and the speed of the tasks, also decreases mistakes, some educationalists state that this use of AI can weaken the ability of critical thinking and decision making as one of the major requirements in medical students (6). Moreover, AI development in the field of medical education and medicine causes fewer interactions, communications, and empathies between physicians and patients (7).

On the other hand, besides many advantages of the use of AI in medical education and assessment including its cost beneficial, less harm to the patients, providing immediate feedback, enhancing problem-based learning, improving clinical competencies; some aspects of AI in education such as the reduced need for teacher supervision acts as a double-edged sword (8). Although the advantages of AI can cover its disadvantages, there are critical limitations to apply AI in the medical education system; These limitations include lack of knowledge of both instructors and learners about AI, lack of adequate structured curriculum to apply for AI base

programs, lack of digitalization tools, poor data pools, and security issues obstacles (6, 9, 10).

Finally, it can be concluded that although AI advantages push us to apply it in our medical educational system, its limitations and obstacles in the Iranian medical educational system make it difficult to use this valuable technology (Figure 1.). By the way, a glance at the AI-based learning advantages can make policymakers endeavor to resolve current limitations for future developments. Therefore, it is strongly recommended to incline the studies toward the increase of the knowledge of the instructors and learners about AI, train them, rich data pools, and also eliminate obstacles and limitations to apply AI-based learning in Iranian medical educational system as soon as possible.

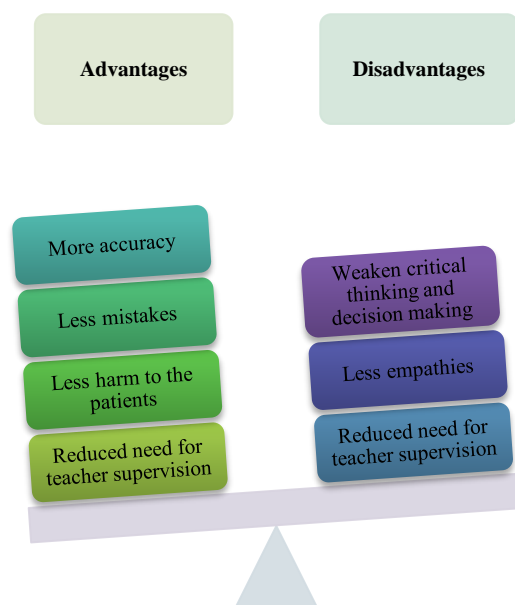


Figure 1. Some advantages and disadvantages of AI-based learning in medical education

#### Ethical considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors.

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