Commentary

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Excessive use of LLMs by postgraduate medical students: An academic disaster !

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Abstract

Postgraduate medical training occupies a unique position in medical education. Postgraduate (PG) trainees are simultaneously learners, clinicians, researchers, and teachers. During their training, they participate in seminars and academic activities while also providing patient care, performing procedures, making clinical decisions, and conducting research. This dual academic–clinical responsibility makes postgraduate training intellectually demanding.

The rapid availability of artificial intelligence (AI)-based large language models (LLMs) has substantially changed PG training landscape. PG trainees increasingly use these tools for seminar preparation, case discussions, clinical documentation, conference material preparation, academic communication, and even thesis-related work. While these systems provide rapid access to organised information and improve efficiency, their expanding role raises important educational concerns. The objective of postgraduate training is not merely task completion but the development of clinical reasoning, critical thinking, scientific inquiry, and independent decision-making. Excessive dependence on AI-generated outputs may shift learning from active knowledge construction to passive information acceptance.

Artificial intelligence should serve as an educational aid rather than a cognitive substitute. Medical educators and training bodies should therefore develop structured guidance and regulatory frameworks promoting responsible AI use while preserving the fundamental processes of clinical reasoning, comprehension, and scholarly development that define postgraduate medical education.

Keywords: Artificial intelligence; Large language models; Postgraduate medical education; Medical students; Clinical reasoning; Critical thinking; Academic integrity; AI dependency; Medical training; Generative AI

Postgraduate medical courses are interesting link in the career of a medical student. By then, they become qualified and registered medical practitioners. Still, they are students as they are pursuing postgraduate master's degree course like students. They have to read books, presents cases and seminars and take care of their patients as well. On many occasions, they have to make independent decisions to save lives in times of crisis for their patients. Hence, they have to fit in multiple shoes every day during their three-year training program.

Postgraduate medical(PG) students begin their day in seminar rooms like novices, by lunch, they perform a few procedures, and by night, they become super doctors. Again, as the morning follows the night, they become lamb back in the seminar rooms. These students are not just college students, they are Students for some time, researchers for other times, and doctors for much of the day.

Earlier, it used to be a difficult journey altogether. They had to do a lot of academic, clinical, and research work with their own intelligence and human intelligence, with minimal technological assistance. They used to discuss cases more with their seniors and teachers as they were the only source of information other than books. Human Intelligence had two great limitations: first, it is not available on demand, and second, it is mostly in bits and pieces. So, there was a great need for omnipresent, easily accessible, complete, and comprehensive intelligence for PG medical students, and they got AI, one for all.

Currently, the situation has changed drastically. With the easy availability of AI-based LLM software and algorithms, they are utilising it for everything left and right for seminar preparation, clinical notes, and thesis writing. It has become difficult to understand whether these PG medical students are getting AI assistance to improve their learning or simply they are making the machines learn postgraduate students' problems and their resolutions in a better way.

AI helps them with everything from eliciting patient history to conducting clinical examinations, formulating differential diagnoses, initiating treatment plans, ordering appropriate investigations, and documenting detailed clinical notes. The increasing use of large language models by postgraduate medical students has extended far beyond occasional academic assistance. Many trainees now rely on these tools for a wide range of tasks, including drafting personal communication with faculty and senior residents, preparing seminar presentations, conference slides, mortality and morbidity discussions, and case presentations. More concerning is the growing tendency to use these systems to prepare postgraduate theses.

While artificial intelligence can assist in organizing information and improving language clarity, excessive dependence on such tools risks undermining the

educational purpose of postgraduate research training. The purpose of a postgraduate thesis is not merely to produce a document, but to cultivate the intellectual discipline required for scientific inquiry—an objective that cannot be achieved through algorithmic shortcuts.

Literature suggests that excessive reliance on artificial intelligence tools to answer academic queries may reduce medical students' engagement in active problem-solving and clinical reasoning, potentially impairing the development of critical thinking skills essential for medical practice [1]. AI-generated summaries and instant answers can promote superficial learning behaviors, where students rely on quick information retrieval rather than deep understanding and long-term knowledge retention [2]. Frequent use of generative AI tools for assignments may foster academic dependence, reducing students' motivation to independently search literature, analyze data, and synthesize knowledge [3]. If AI tools are used as a primary source of answers rather than as supportive learning aids, medical students may develop weaker diagnostic reasoning and clinical decision-making abilities [4]. Generative AI systems can enable students to complete essays, reports, and assignments without fully engaging in the learning process, raising concerns regarding academic integrity and genuine competency development [5].

This is a matter of serious concern for medical teachers. A great apprehension growing in their minds as PG students are losing critical thinking skills day by day. They are losing their attention span and memory retention. Moreover, use of free LLM software frequently produces erroneous contents. These students have firm believe in the output of these LLM software, as these output contents are very much organised. They look like perfect descriptions. Unfortunately, these organised contents have errors. PG students may learn wrong things, which may become difficult to unlearn later on. These tools make their job easier, being students, they may believe more in the completion of their academic/clinical assignments rather than factual status of the contents.

While artificial intelligence offers valuable support for information retrieval and educational assistance, excessive dependence on AI-generated outputs may promote superficial learning. Artificial intelligence may serve as an educational aid rather than a cognitive substitute; otherwise, the very process of learning medicine may be gradually undermined. Therefore, medical educators must carefully evaluate the role of AI in postgraduate medical education and develop structured strategies or regulatory frameworks that encourage responsible use of these tools while preserving the essential processes of clinical reasoning, comprehension, and analytical thinking that form the foundation of medical training.

Declarations

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