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Mapping Factors Influencing the Psychological Well-Being of Medical Students Interacting with Generative Artificial Intelligence: A Scoping Review

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Keywords: medical students, generative AI, ChatGPT, LLMs, psychological well-being, mental health, medical education, generative artificial intelligence, being of medical student, addressing medical student, psychological well, medical student, experiences with genai, medical education, clinical reasoning, rapid integration of generative artificial intelligence, interactions with genai, adapted conceptual model, genai, eligible study, anxiety about reliability, generative artificial intelligence, educational context, thematic analysis, including anxiety, conceptual model, academic engagement

Abstract

The rapid integration of generative artificial intelligence (GenAI) tools such as ChatGPT and large language models (LLMs) into medical education has created new opportunities for learning, simulation, and clinical reasoning. However, these technologies also introduce potential challenges affecting students' psychological well-being, including anxiety about reliability, ethical concerns, and changes in academic engagement. This protocol describes a scoping review designed to map the factors influencing the psychological well-being of medical students in their interactions with GenAI. The review will follow the methodological framework proposed by Arksey and O'Malley and guided by the PRISMA-ScR checklist. Searches will be conducted across international and Persian databases from 2018 onward, using the PCC framework (Population–Concept–Context) to ensure comprehensive coverage.

Eligible studies will include empirical and theoretical works addressing medical students' experiences with GenAI in educational contexts. Data will be extracted using a structured form and synthesized through descriptive mapping and thematic analysis.

The expected outcome is a conceptual framework summarizing factors that positively or negatively influence medical students' psychological well-being when engaging with GenAI. This review will identify knowledge gaps and provide evidence to inform educational policy, research, and the development of a culturally adapted conceptual model based on the METUX framework.



Before start

This scoping review is conducted as part of the first sub-study of a doctoral dissertation in *E-Learning in Medical Sciences*, approved and currently underway at **Smart University of Medical Sciences (SUMS), Iran**.

The overarching PhD project is entitled:

“Design of A Conceptual Model for the Psychological Well-Being of Medical Students Interacting with Generative Artificial Intelligence, Based on the METUX Model.”

The present protocol represents the first phase of the research, aiming to systematically map existing evidence and conceptual components related to the psychological well-being of medical students interacting with generative AI. The findings of this review will form the theoretical foundation for subsequent qualitative and model development phases of the doctoral project.

Methodology

- 1 A scoping review will be conducted following the methodological framework proposed by Arksey and O'Malley (2005), refined by Levac et al. (2010), and guided by the PRISMA-ScR checklist (Tricco et al., 2018).

The review will follow five compulsory stages:

Identifying the research question

Identifying relevant studies

Study selection

Charting the data

Collating, summarizing, and reporting results

Search Strategy

- 2 The search strategy will be developed using the PCC framework (Population, Concept, Context) recommended by JBI.

Population: Medical students

Concept: Psychological well-being in interaction with generative AI

Context: Medical education and learning environments

Databases: PubMed, Scopus, Web of Science, ERIC, IEEE Xplore, Google Scholar, Litmaps, and Persian databases.

Keywords: medical students, generative AI, ChatGPT, LLMs, psychological well-being, mental health, medical education.

Inclusion criteria: studies involving medical students; focus on interactions with GenAI; outcomes related to psychological or mental well-being; English or Persian publications from 2018 onward.

Exclusion criteria: non-medical student populations; studies unrelated to GenAI; lack of full-text availability.

Study Selection and Data Charting

- 3 After removing duplicates, studies will be screened by two independent reviewers using inclusion and exclusion criteria. Disagreements will be resolved through discussion or third-party consultation.

A data extraction form (Excel-based) will collect key information: author, year, country, AI model, population details, positive/negative factors, outcomes, and instruments used.

Critical Appraisal and Data Synthesis

- 4 Although optional in scoping reviews, methodological quality will be assessed using the Mixed Methods Appraisal Tool (MMAT).



Data will be synthesized through both numerical mapping (frequency and distribution) and thematic analysis, based on Braun and Clarke's (2006) six-phase framework.

Reporting

- 5 The results will be reported according to PRISMA-ScR items (Tricco et al., 2018). The findings will include identified themes, conceptual relationships, and gaps to inform the next qualitative phase of the doctoral project.

Expected Outcomes

- 6 A conceptual thematic framework describing factors affecting the psychological well-being of medical students in interaction with GenAI.
Identification of research and educational gaps in GenAI-assisted medical learning.
Foundational input for developing a culturally adapted conceptual model based on METUX.

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