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Artificial Intelligence in Healthcare Literacy: Promise, Gaps, and Guardrails

Inteligência Artificial na Literacia em Saúde: Potencial, Lacunas e Salvaguardas

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A timely inquiry into artificial intelligence for healthcare literacy

In this issue of Acta Médica Portuguesa, Ganicho *et al* present an exploratory study assessing ChatGPT's ability to respond to patient questions about HIV and pre-exposure prophylaxis (PrEP).[1] By submitting common queries to ChatGPT and scoring responses across clearly defined metrics, the authors provide structured evidence that artificial intelligence (AI) generated content may support health literacy efforts.[2] This is particularly relevant for strained healthcare systems, where clinicians have limited time for patient education.

The results appear promising: 80% of responses achieved a mean expert rating above four out of five, suggesting that, when deployed responsibly, AI could serve as a helpful adjunct in Portuguese patient education. The study identifies the potential of ChatGPT to offer real-time, private, and accessible information, especially to individuals with lower health literacy who face barriers in traditional healthcare communication. At the same time, equity considerations must not be overlooked, as the effectiveness of such tools may disproportionately favor already digitally literate individuals, exacerbating existing disparities in access to health information.

A fertile ground for application in clinical systems

Portugal's healthcare system may be especially fertile ground for the integration of such tools.[3] Portuguese clinicians often lack assistance from dedicated clinical support staff, making their time an especially scarce resource. Unlike the UK, where doctor's assistants support clinicians by taking notes during ward rounds, preparing clinical documentation, and coordinating follow-up appointments, no equivalent role exists in Portugal. Artificial intelligence tools that streamline communication and support patient understanding could improve care efficiency.

The implications extend beyond the individual to public health. In the context of infectious disease prevention programs, particularly for conditions like HIV and viral hepatitis, AI-assisted tools have demonstrated their ability in helping fine-tune screening algorithms.[4] By integrating diverse data sources – demographics, postal codes, prior infection history, and patterns of healthcare utilization – AI-powered electronic health record systems can identify individuals for screening when they present for urgent or routine care, creating a middle ground between costly universal approaches and narrowly risk-based strategies, which often result in missed opportunities for diagnosis. Whether one defines this as 'AI', 'machine learning', or simply 'big data' may be a matter of semantics, but the application is both practical and promising.

Looming ethical, legal, and systemic questions

While the study makes a very valuable contribution, it reflects a broader trend in early AI research penned by physicians, where policy implications are underexplored.[5] These dimensions, however, cannot be decoupled and are critical to address before such tools can be responsibly implemented at scale. While AI holds significant promise for health counseling and literacy, its integration into practice must abide by a modicum of appropriate ethical, legal, and operational frameworks.

First, the issue of ethical usage deserves close attention. Without clear guardrails, AI platforms risk perpetuating bias or disseminating misinformation, especially in sensitive areas such as HIV counseling.

Second, the question of medical liability remains unresolved. Should a patient suffer harm as a result of AI-generated advice, responsibility would be difficult to assign under current legal frameworks.

Third, although ChatGPT was used in its non-memory, anonymous version in the study, any future application in clinical environments must ensure compliance with patient and data protection laws, particularly the European Union's (EU) General Data Protection Regulation (GDPR). Artificial intelligence platform deployments must be designed to

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preserve patient confidentiality as rigorously as any other tool.

Fourth, reliance on proprietary, general-purpose platforms like ChatGPT, DeepSeek, Perplexity, and others presents structural challenges, as they may lack the sector-specific transparency and oversight necessary for healthcare. These tools are developed by private entities, often opaque in their data sources and potentially susceptible to internal and external pressures, as has been documented with Grok.[6] Responsible paths forward will require platform-agnostic guidelines with a minimum degree of public oversight. As an alternative to relying on general-purpose platforms, the development of patient-facing tools by dedicated healthcare software companies operating within the sector may offer a more viable route, as these entities are better equipped to navigate the regulatory intricacies of healthcare.

Lastly, governance remains a complex and unresolved issue. Under the EU AI Act, AI systems used for medical purposes must comply with specific requirements, including risk-mitigation protocols, human oversight, and quality data standards.[7] Oversight responsibilities are centralized within the newly established European AI Office, which supervises implementation and compliance. However, at the local level, it is still unclear who will approve and monitor the safety of these tools. The AI Act, together with the revised Product Liability Directive, clarifies that AI systems used in healthcare, including software, fall under the regulatory frameworks applied to medical devices and are subject to liability if defects cause harm.[8] Are national regulatory agencies currently equipped to undertake this role effectively, both in terms of resources and technical expertise?

Although full implementation and transposition of the AI Act will unfold progressively over the coming years, the practical impact of these frameworks remains uncertain, particularly as the pace of innovation in the field may outdo Europe's regulatory rollout. As a result, such technologies are likely to be adopted in practice across the continent before the EU's legal safeguards are fully operational – a pattern already evident in the cases of telehealth and healthcare professionals' use of social media, both of which hold significant potential to reduce health disparities but remain largely unregulated and unmonitored.

Future research and implementation priorities

The path ahead must include cross-disciplinary research involving not just clinicians, but also data scientists, implementation researchers, and legal experts. Studies comparing AI-generated counseling to human-delivered responses could help evaluate whether these tools enhance or hinder communication. This is especially important in areas such as empathy, nuance, and behavioral reinforcement – critical elements in counseling for conditions that carry stigma, like HIV.

Moreover, if AI tools are being used in medical publishing, as some journals are beginning to allow, clarity is needed around their role. While their capacity to edit language and reduce native-speaker acceptance bias is commendable, their current limitations in statistical reasoning and logic make them unreliable for biostatistical analyses.

More broadly, healthcare researchers using AI must resist the temptation to ignore implementation concerns. Historically, physicians have distanced themselves from management disciplines and discussions around healthcare cost, only to later realize its centrality to sustainable care. The same must not happen with AI. Understanding the systems into which AI will be deployed, and the laws that will govern its use, is essential. For this reason, collaboration with experts in health law and policy is not optional but necessary.

From *ad hoc* appraisal to methodological maturity

Ganicho *et al* lay important groundwork in a field where fewer than ten indexed studies currently address the use of AI in healthcare in Portugal. Their use of predefined quality criteria and expert scoring is a welcome departure from anecdotal assessments that have characterized early AI studies. Future efforts should build on this by adopting key tenets of qualitative research, including validated scoring systems, involving diverse evaluators, and incorporating patient feedback.

Indeed, if this line of research is to advance responsibly, clinicians must become more than end-users. They must engage with how systems are built, evaluated, and governed. Just as previous generations of doctors embraced healthcare management and economics, or health systems research at the turn of the century, today's practitioners must become literate in data science, artificial intelligence, and digital ethics.

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