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## **ChatGPT: A Novel AI Assistant for Healthcare Messaging - A Commentary on Its Potential in Addressing Patient Queries and Reducing Clinician Burnout**

The COVID-19 pandemic has drastically reshaped the delivery of healthcare, with an accelerated transition towards virtual care and telemedicine[1]. This transition has culminated in a significant escalation of electronic patient messaging, thereby amplifying the workload of healthcare professionals, who already face escalating rates of burnout[2]. Considering a large number of physicians experiencing at least one symptom of burnout, it is critical to address the impact of patient messaging to safeguard healthcare delivery quality[3].

A myriad of strategies has been suggested to mitigate the burden of electronic messaging, including limiting notifications, billing for responses, or outsourcing responses to lesser-trained support staff[4]. However, these strategies risk limiting high-quality healthcare access. For example, notifying patients about potential charges for messaging can lead to decreased message frequency and shorter clinician exchanges[5]. The advent of artificial intelligence (AI) assistants offers a promising solution to this issue, although a comprehensive examination of their capacity to respond effectively and empathetically to patient inquiries remains due.

ChatGPT, a new generation AI technology, has been powered by advancements in large language models and has been lauded for its ability to generate near-human-quality text on a broad array of topics. Despite not being specifically designed for healthcare applications, the potential of ChatGPT to address patient queries warrants further exploration[6]. Recent research[7] aimed to assess whether AI chatbot assistants could offer responses to patient queries that matched the quality and empathy of physicians' responses. The results indicate that AI assistants, such as ChatGPT, could potentially alleviate the strain of electronic patient messaging on healthcare professionals without compromising the quality or empathy of responses. This could lead to reductions in physician burnout and improvements in patient satisfaction, both vital goals in healthcare delivery.

ChatGPT could further support clinicians by liberating them to concentrate on more intricate tasks, like diagnosis or pathology. The technology can be further customised to support a plethora of healthcare services through integration with electronic health records (EHRs), enabling ChatGPT to answer patient queries more accurately and even autonomously in certain circumstances.

However, while ChatGPT has demonstrated its capacity to generate high-quality and empathetic responses, there exist potential ethical and practical concerns with its use in healthcare, such as the risk of misinformation or inappropriate advice[8]. A significant issue is the production of hallucinations: the generation of false information that may be attributed to insufficient training data. Such confabulation is presented confidently, as if it were a fact, and could lead to the proliferation of misinformation. This is particularly disruptive in healthcare, a setting in which AI tools are being developed to empathetically interact with patients, provide information, and answer questions. Further, limitations of training data mean that AI systems in healthcare may not have access to the most recent information, updates, or real-time data.

Future research should aim to validate these results across larger and more diverse patient populations, while also evaluating the performance of AI assistants in real-world clinical settings. For instance, a randomised control trial might be conducted comparing the quality and empathy of physician responses with those generated by AI assistants in an outpatient setting. This would offer valuable insights into the potential impacts of ChatGPT on healthcare delivery. Researchers should also explore methods to mitigate potential risks associated with AI use in healthcare and develop strategies for seamless integration into existing workflows. Additionally, the ethical implications of AI must be further examined to ensure patient safety and privacy. If ChatGPT can provide high-quality and empathetic responses to patient queries without compromising healthcare professionals' time or resources, it could prove to be a transformational tool for healthcare delivery.

Beyond electronic patient messaging, AI assistants like ChatGPT could contribute in multiple healthcare facets, such as customised health education and support for patients managing chronic conditions. By delivering accurate and comprehensible information, AI assistants could empower patients to manage their own health, potentially leading to enhanced outcomes and adherence to treatment plans.

In mental health care settings, ChatGPT could offer initial support and triage for individuals seeking assistance. By engaging in empathetic and non-judgemental dialogues, AI assistants can provide a secure environment for patients to voice their concerns and needs. This could streamline the process of linking patients with appropriate mental health services and resources, reducing waiting times and ultimately leading to better mental health outcomes.

Another potential application of ChatGPT in healthcare is its integration with telemedicine platforms. As telemedicine continues to grow, AI-driven chatbots can assist with routine tasks such as scheduling appointments, prescription refills, and answering frequently asked questions, thereby freeing healthcare professionals to focus on the more critical aspects of patient care.

Furthermore, AI assistants like ChatGPT could potentially help address healthcare disparities and increase access to care in underserved communities. By harnessing AI technology, it could be possible to overcome language barriers, provide culturally competent care, and expand access to healthcare information in remote or underserved areas. This could considerably improve health equity and overall population health.

However, alongside these potential benefits, challenges must be considered when implementing AI-driven solutions like ChatGPT in healthcare. One such challenge is ensuring that AI algorithms are unbiased and do not inadvertently perpetuate existing health disparities. The introduction of AI means that the digital divide continues to widen: requiring reliable infrastructure, access to technology, internet access, and digital literacy, there is an ever-growing need for training and education incentives, localised and culturally sensitive deployment, and an iterative process of feedback and development.

Algorithms must also protect patient autonomy; the provision of biased and generic information, neglect of individual preferences, and the inability to fully capture the complexity of healthcare decision-making could result in AI impeding fully informed decision making. Therefore, researchers and developers must prioritise transparency and fairness in the development and evaluation of AI technology, ensuring that these tools benefit all patients equally.

Addressing privacy, data security, and patient consent issues is pivotal before the widespread adoption of AI assistants in healthcare settings. Crucially, compliance with data protection laws, such as the General Data Protection Regulation (GDPR) and the Data Protection Act (DPA) may be hard to achieve; AI systems rely heavily on data exchange and interconnectedness, creating vulnerability to data breaches and cyber attacks. AI systems must be designed and implemented with the necessary privacy safe-guards and non-compliance with stringent data protection regulations may result in severe legal consequences for healthcare organisations, including considerable fines and reputational damage.

A further concern is the complexity of AI algorithms. The black-box nature of many algorithms prevents us from fully comprehending the underlying process and, thus, how these algorithms arrive at their decisions. This opacity impedes ability to identify biases, potential errors, or the inclusion of irrelevant or misleading data. This not only undermines the trustworthiness of the algorithm but hinders their integration into healthcare. Furthermore, the dynamic nature of algorithms, which continuously and rapidly evolved based on new data, further complicates regulation and implementation. The EU AI Act is a framework, in development, that aims to classify AI systems based on level of risk. There is currently no legislation in place governing the use of AI in the UK. However, a framework, “The AI and Digital Healthcare Technologies Framework” has been published by Health Education England to support digital transformation, including identifying gaps in current knowledge of NHS staff. Moreover, the significance of human connection in everyday healthcare interactions cannot be understated. As the transition to telemedicine accelerates, it's crucial to consider the potential loss of interpersonal communication. Social interactions play a pivotal role in fostering a sense of emotional support, guidance, and trust between patients and healthcare providers, which have been shown to be essential in facilitating positive patient outcomes[9]. This loss of human connection could negatively impact healthcare interactions, and patients may experience feelings of isolation and lack of support when communication is assisted by AI technology.

Additionally, healthcare professionals must receive proper training and support to effectively utilise AI technology in their practice. This includes understanding the capabilities and limitations of AI tools like ChatGPT, as well as being prepared to manage potential risks associated with their use. Cultivating a culture of collaboration and learning will be crucial for the successful integration of AI technology into healthcare settings. While AI may create new types of job role, job security may also be threatened as roles may undergo changes, require the acquisition of new skills, or become redundant.

In conclusion, AI assistants like ChatGPT hold immense potential in addressing the escalating burden of electronic patient messaging by providing high-quality and empathetic responses without adding to the workload of healthcare professionals. ChatGPT is just one of the many available generative language algorithms and while challenges remain in ensuring the safe,

private, and ethical use of AI in healthcare, the current study provides encouraging evidence of the benefits of AI-driven patient communication. As AI technology advances, its integration into healthcare settings could lead to improved patient outcomes and satisfaction, ultimately transforming healthcare delivery.

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