

Envisioning the Future of ChatGPT in Healthcare: Insights and Recommendations from a Systematic Identification of Influential Research and a Call for Papers

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Abstract

Background and Aims: ChatGPT represents the most popular and widely used generative artificial intelligence (AI) model that received significant attention in healthcare research. The aim of the current study was to assess the future trajectory of the needed research in this domain based on the recommendations of the top influential published records.

Materials and Methods: A systematic search was conducted on Scopus, Web of Science, and Google Scholar (27–30 November 2023) to identify the top ten ChatGPT-related published records in healthcare across the three databases. Classification of the records as “top” denoting high influence in the field was based on citation counts.

Results: A total of 22 unique records from 17 different journals representing 14 different publishers were identified as the top ChatGPT-related publications in healthcare subject. Based on the identified records’ recommendations, the following themes appeared as important areas to consider in future ChatGPT research in healthcare: improving healthcare education, improved efficiency of clinical processes (e.g., documentation), addressing ethical concerns (e.g., patient privacy and consent), supporting research tasks (e.g., data analysis, manuscript preparation), mitigating ChatGPT output biases, improving patient education and engagement, and developing standardized assessment protocols for ChatGPT utility in healthcare.

Conclusions: The current review highlighted key areas to be prioritized in assessment of ChatGPT utility in healthcare. Interdisciplinary collaborations and standardizing methodologies are needed to synthesize robust evidence in these studies. Based on these recommendations and the promising potential of ChatGPT on healthcare, *JMJ* launched a call for papers for a special issue entitled “*Evaluating Generative AI-Based Models in Healthcare*”.

Keywords: Artificial Intelligence; Generative Pre-trained Transformer; Natural Language Processing; Healthcare Education; Bibliometrics.

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INTRODUCTION

The public release of ChatGPT by OpenAI in November 2022 marked a key moment in the evolution of natural language processing (NLP), particularly in the domain of generative artificial intelligence (AI) models [1]. ChatGPT is characterized by the advanced capabilities to

generate human-like text that is coherent in response to a wide range of prompts [2]. Thereby, ChatGPT emerged as a revolutionary technological innovation with the potential to transform different aspects of human life in the near future [3,4].

Healthcare sector is considered one of the major domains where ChatGPT incorporation could be particularly transformative [5,6]. The integration of generative AI models such as ChatGPT in healthcare education and practice could pave the way for numerous promising possibilities, since innovation and efficiency are essential elements in the ongoing evolution of healthcare [5,7]. Consequently, generative AI models including ChatGPT has the potential to enhance healthcare education and practice which is

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emphasized by the rapid growth of literature exploring this subject and wide popularity of its use among educators and university students [5,8-10].

In terms of healthcare education, ChatGPT could help in tailoring educational content to the students' learning preferences improving their engagement in the educational processes [11-13]. Additionally, ChatGPT can aid educators in organizing the teaching materials and in automating essay scoring which would help to increase the efficiency of evaluation [14]. Furthermore, ChatGPT can contribute to the digitalization of education, improving the efficiency and quality of the pedagogical methods [15,16].

Recent studies on ChatGPT applicability in healthcare highlighted its wide range of applications across various disciplines (e.g., radiology, ophthalmology, pathology, and microbiology) and its potential use in self-diagnosis and to improve health literacy [17-20]. On the other hand, recent studies and reviews emphasized the importance of addressing the possible limitations and risks that could emerge as a result of ChatGPT integration in healthcare education and practice [5,21,22].

Despite the benefits of AI among other digital tools to humans, their implementation can often be met with apprehension and resistance [23]. This reaction can be fathomable considering the innate resistance to change in the human brain, as well as the fear of concerns regarding the potential risks associated with these technologies [23,24]. In the case of ChatGPT, these concerns appear well-founded based on the recent evidence highlighting its risks and limitations [5,22,25,26]. Such concerns led to banning ChatGPT access in several countries, with the Italian data protection authority justifying such a ban based on privacy concerns [27].

In healthcare, ChatGPT risks are particularly worrying which include the potential of ChatGPT to generate inaccurate or misleading content, the inherent biases in the training algorithms, and the exacerbation of the digital divide within and across different societies [5,22,28]. The latter issue is particularly relevant since developing nations may face challenges in adopting and accessing advanced AI technologies, potentially exacerbating the already existing disparities in the access to healthcare services and quality education [29-31].

Despite the rapid growth of literature on ChatGPT utility in healthcare education and practice, a clearer direction for future research on this subject is needed [32]. Such an initiative can help to provide a systematic framework for identification of research priorities in this critical

emerging research subject. Consequently, this effort can guide the strategic direction of ChatGPT research in healthcare.

To address this emerging need, this study aimed to define future research areas regarding ChatGPT utility in healthcare education, practice, and research based on the insights and recommendations from the top influential published records on this research topic. Addressing this objective systematically can provide roadmap for researchers, policymakers, health professionals, and educators to advance healthcare delivery, patient outcomes, and healthcare education.

MATERIALS AND METHODS

Study Design

This study was based on a previous bibliometric analysis study that identified the top ten ChatGPT-related healthcare published records over the period of a year (November 2022–November 2023) [33]. Identification of these top records was based on the citation counts across Scopus, Web of Science, and Google Scholar databases, which were selected to achieve a comprehensive coverage of academic literature in the study subject. The search process was completed on 27 November 2023.

Search Strategies and Inclusion Criteria

The search process for ChatGPT-related healthcare publications involved the three databases (Scopus, Web of Science, and Google Scholar) concurrently on the same day (27 November 2023) by a single author (M.S.). Each database was searched using specific terms related to ChatGPT and healthcare. The detailed search strategy is available in [33].

The Scopus and Web of Science searches were done directly on the databases' websites, while Google Scholar search was conducted using the Publish or Perish software [34]. Full bibliographic data from each database search were extracted and the records were sorted by citation counts. The top 10 published records from each database were selected after reviewing titles and abstracts for eligibility based on involvement of research of ChatGPT in healthcare education, research, or practice regardless of the publication type. The records were deemed eligible for inclusion if they evaluated any aspect of ChatGPT applications in healthcare education, research, or practice. The evaluation was done by the first author (M.S.) based on the approach described in [33].

Descriptive Analysis of the Recommendations/ Conclusions

The unique records retrieved from the three

databases were screened for the recommendations and conclusions by the first and second authors. Descriptive analysis of the recommendations and conclusions drawn from each unique record was done through screening the Discussion and Conclusions sections (if available). This was done to identify, organize, and summarize the main recommendations and final conclusions drawn in the included records. Through this systematic and detailed approach, we aimed to elucidate common themes and emerging insights regarding the application and impact of ChatGPT in the subjects of healthcare education, practice, and research.

This was followed by classification of the records into three major categories: (1) ChatGPT in

healthcare education, (2) ChatGPT in healthcare practice, and (3) ChatGPT in healthcare research.

RESULTS

Characteristics of the included records

A total of 22 unique records were identified across the three databases. The classification of these influential records is illustrated in (**Table 1**). A total of 12/22 records addressed ChatGPT in healthcare practice (54.5%) compared to 8/22 records that investigated ChatGPT in healthcare research (36.4%), and 7/22 records on ChatGPT in healthcare education (31.8%). Two records investigated the three healthcare aspects [2,5].

Table 1. Summary of the top 22 healthcare-related influential records on ChatGPT in Scopus, Web of Science, and Google Scholar (GS) and its classification.

Authors	Title	Education	Practice	Research	GS Citations ¹
Kung et al. [35]	Performance of ChatGPT on USMLE: Potential for AI-assisted medical education using large language models	YES			1243
Sallam [5]	ChatGPT Utility in Healthcare Education, Research, and Practice: Systematic Review on the Promising Perspectives and Valid Concerns	YES	YES	YES	716
Gilson et al. [36]	How Does ChatGPT Perform on the United States Medical Licensing Examination? The Implications of Large Language Models for Medical Education and Knowledge Assessment	YES			586
Ray [2]	ChatGPT: A comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope	YES	YES	YES	465
Lee et al. [37]	Benefits, Limits, and Risks of GPT-4 as an AI Chatbot for Medicine		YES		457
Alkaissi & McFarlane [38]	Artificial Hallucinations in ChatGPT: Implications in Scientific Writing			YES	453
Ayers et al. [39]	Comparing Physician and Artificial Intelligence Chatbot Responses to Patient Questions Posted to a Public Social Media Forum		YES		389
Shen et al. [40]	ChatGPT and Other Large Language Models Are Double-edged Swords		YES		377
Cascella et al. [41]	Evaluating the Feasibility of ChatGPT in Healthcare: An Analysis of Multiple Clinical and Research Scenarios			YES	333
Liebreuz et al. [42]	Generating scholarly content with ChatGPT: ethical challenges for medical publishing			YES	306
Patel & Lam [43]	ChatGPT: the future of discharge summaries?		YES		302
Biswas [44]	ChatGPT and the Future of Medical Writing			YES	293

Authors	Title	Education	Practice	Research	GS Citations ¹
Eysenbach [45]	The Role of ChatGPT, Generative Language Models, and Artificial Intelligence in Medical Education: A Conversation With ChatGPT and a Call for Papers	YES			256
Khan et al. [46]	ChatGPT - Reshaping medical education and clinical management	YES	YES		247
Dave et al. [6]	ChatGPT in medicine: an overview of its applications, advantages, limitations, future prospects, and ethical considerations		YES		191
De Angelis et al. [47]	ChatGPT and the rise of large language models: the new AI-driven infodemic threat in public health		YES		166
Korngiebel & Mooney [48]	Considering the possibilities and pitfalls of Generative Pre-trained Transformer 3 (GPT-3) in healthcare delivery		YES		129
Vaishya et al. [49]	ChatGPT: Is this version good for healthcare and research?			YES	128
Hopkins et al. [50]	Artificial intelligence chatbots will revolutionize how cancer patients access information: ChatGPT represents a paradigm-shift		YES		90
Sinha et al. [51]	Applicability of ChatGPT in Assisting to Solve Higher Order Problems in Pathology	YES			84
Nature Medicine Editorial [52]	Will ChatGPT transform healthcare?		YES		82*
Temsah et al. [53]	Overview of Early ChatGPT's Presence in Medical Literature: Insights from a Hybrid Literature Review by ChatGPT and Human Experts			YES	70

¹Based on data retrieved directly from Google Scholar as of 23 January 2024; *Based on CrossRef citations.

Recommendations Based on the Most Influential Records for Future ChatGPT Research in Healthcare Education

Summary of the conclusions and recommendations on ChatGPT research in healthcare education based on 7 influential records is outlined in (Table 2). The key themes identified

from these records included (1) the need to investigate ChatGPT cost-effectiveness compared to traditional study aids; (2) the need to develop ethical guidelines for ChatGPT use in healthcare education; (3) the credibility of current assessment tools in education; (4) assessment of ChatGPT enhancement of personalized education.

Table 2. Recommendations of the Top healthcare related ChatGPT sorted by Google Scholar Citations as of 23 January 2024.

Authors	Recommendations/conclusions
Kung et al. [35]	It is recommended to conduct future studies to compare the performance of medical students using ChatGPT assistance with those who do not, under controlled long-term conditions. This includes a unit economic analysis aimed to determine the cost-effectiveness of ChatGPT-assisted education in comparison to traditional virtual tutors or study aids; the potential role of ChatGPT in reducing the burden of creating authentic clinical vignettes should be considered; there is a need to standardize experimental methods, outcomes, and benchmarks to ensure the reliability of findings related to human-ChatGPT interactions; incorporating ChatGPT into clinical workflow to enhance efficiency, particularly in drafting correspondence, simplifying complex medical concepts for patients, and aiding in the diagnostic process for complex cases.
Sallam [5]	There is an urgent need for establishing guidelines for ethical and responsible use of ChatGPT in healthcare education; evaluate the utility of ChatGPT in advancing healthcare education; assess the impact of ChatGPT on the credibility of the current assessment tools in healthcare education; investigate the potential of ChatGPT to improve communication skills among healthcare students.
Gilson et al. [36]	Use of ChatGPT as a surrogate for small group education; personalized education.
Ray [2]	Creating personalized learning materials tailored to individual needs, offering real-time feedback and guidance, developing engaging content like quizzes and interactive exercises, aiding educators in grading and feedback, and establishing adaptive learning environments responsive to learner progress.
Eysenbach [45]	ChatGPT can significantly enhance medical education by offering personalized learning experiences, creating realistic patient scenarios, augmenting textbooks, and summarizing medical research, while emphasizing that they complement, rather than replace, hands-on clinical training and expert medical guidance.
Khan et al. [46]	ChatGPT is a supplementary tool in medical education and practice, complementing the human expertise.
Sinha et al. [51]	Medical schools should train students in judicious ChatGPT use rather than complete ban; careful design and implementation of AI tools is needed to enhance its role in healthcare education and practice.

Recommendations Based on the Most Influential Records for Future ChatGPT Research in Healthcare Practice

Summary of the conclusions/recommendations on ChatGPT research in healthcare practice based on 12 influential records is outlined in (Table 3). The key themes identified from these records included the urgent need for ethical guidelines and responsible ChatGPT application in healthcare. Key applications

included patient triage, diagnosis, treatment planning, and enhancing personalized medicine through improved patient engagement. Key aspects included the need for clear implementation guidance, transparency, and standards for ChatGPT generated content. Finally, a key theme was advocating for collaboration between humans and ChatGPT to optimize personalized medicine.

Table 3. Summary of the top healthcare-related influential records on ChatGPT in healthcare practice.

Authors	Recommendations/conclusions
Sallam [5]	There is an urgent need for establishing guidelines for ethical and responsible use of ChatGPT in healthcare practice; investigate the patient preference of ChatGPT assistance characterized by efficiency vs. emotional support from health professionals; the real-world impact of ChatGPT should be properly evaluated using a risk-based approach.
Ray [2]	ChatGPT applications include patient triage, possible help in diagnosing and treatment planning; aid in personalized medicine with patient engagement and compliance to treatment.
Shen et al. [40]	Awareness of health professionals is needed to remain vigilant about biases and inaccuracies in ChatGPT output; healthcare professionals can use ChatGPT to generate medical report templates and patient histories summaries enhancing workflow; ChatGPT can help to draft communications aimed at lawmakers and the public for health advocacy.
Khan et al. [46]	ChatGPT is a supplementary tool in medical practice, complementing the human expertise; there is a need for an open-minded adoption of AI tools in healthcare.
Lee et al. [37]	Establishing approaches to evaluate the general intelligence of ChatGPT; define the extent to which ChatGPT output needs verification; establish to what extent can ChatGPT aid in verification tasks.
Ayers et al. [39]	Future studies should investigate ChatGPT performance in response to patients in different settings; motivate the adoption of ChatGPT as a clinical assistant to tailor messaging to patient queries; investigate the utility of ChatGPT to improve the workflow.
Patel & Lam [43]	Explore and adopt ChatGPT in healthcare, addressing potential challenges.
Korngiebel & Mooney [48]	ChatGPT can improve efficiency of healthcare delivery; implementation guidance is needed; transparency is the key for ChatGPT use.
Dave et al. [6]	A comprehensive evaluation of ChatGPT ethical challenges and limitations in healthcare is needed including the issues of credibility and biases with future effective mitigation approaches.
De Angelis et al. [47]	Editors should carefully examine ChatGPT outputs; journals should enforce strict ChatGPT usage guidelines.
Hopkins et al. [50]	Develop standards for minimum quality; raise patient awareness of ChatGPT limitations.
Nature Medicine Editorial [52]	Human-ChatGPT collaboration can enhance personalized medicine tools; all stakeholders should engage in a discussion to identify proper guidelines for optimal use strategies.

Recommendations Based on the Most Influential Records for Future ChatGPT Research in Healthcare Research

Summary of the conclusions/recommendations on ChatGPT research in healthcare research based on 8 influential records is outlined in (Table 4). The key themes of the included records included the critical need for establishing ethical guidelines for ChatGPT use in healthcare research, including its utility in roles like academic editing and peer

reviewing. Additionally, the included records recommended the investigation of ChatGPT use in clinical data analysis, literature review, hypothesis generation, and data management. Moreover, the included records recommended addressing ChatGPT limitations, such as biases and inaccuracies, as well as the potential use of ChatGPT to overcome language barriers in medical publishing.

Table 4. Summary of the top healthcare-related influential records on ChatGPT in healthcare research.

Authors	Recommendations/conclusions
Sallam [5]	There is an urgent need for establishing guidelines for ethical and responsible use of ChatGPT in healthcare research; evaluate the utility of ChatGPT in advancing healthcare research; investigate the potential of ChatGPT to act as an academic editor or peer reviewer.
Ray [2]	ChatGPT applications in analysis of clinical data.
Alkaissi & McFarlane [38]	Update the evaluation policies for scientific manuscripts to ensure scientific integrity; integrate ChatGPT output detection in the editorial process; there is a need for transparent acknowledgment of ChatGPT usage in medical research.
Cascella et al. [41]	ChatGPT can help in medical research through literature review, hypothesis generation, and data management; understanding ChatGPT limitations, such as inaccurate content and biases is needed; clear understanding of the boundaries can guide effective use.
Liebrezn et al. [42]	ChatGPT could help to overcome language barriers in medical publishing; the risk of infodemics highlights the need for ethical guidelines on use of ChatGPT content in medical publishing.
Biswas [44]	ChatGPT can assist in medical writing.
Vaishya et al. [49]	Rigorous checking of the content is required; medical publishers should include ChatGPT output detectors in the editorial process; transparency through declaration of use in medical research.
Temsah et al. [53]	Research is recommended to assess the performance and ethical issues of ChatGPT across different subjects.

Summary of the Insights for Future ChatGPT Research in Healthcare

The recommendations for future research based on the included influential records can be divided as follow: (1) personalized learning enhancement, (2) utility for clinical simulations, (3) consideration of ethical issues, (4) comparison between the traditional and AI-based methods in education, (5) streamlining healthcare processes, (6) assessment of

utility in clinical documentation, (7) assessment of information accuracy and reliability, (8) investigation of aspects of bias in the content and how to mitigate it, (9) exploration of ChatGPT utility in patient education, and (10) Evaluation of ChatGPT contribution as assistant in grant writing, manuscript preparation, and data management. Summary of the conclusions/recommendations is illustrated in (Figure 1).

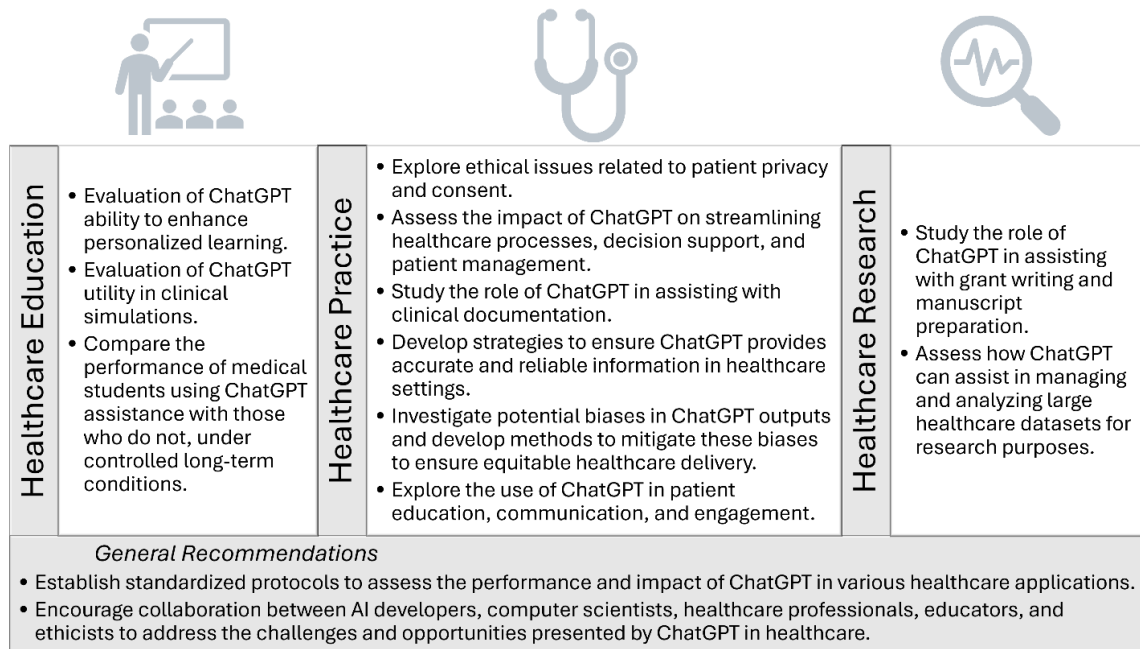


Figure 1. Summary of the recommendations for future research on ChatGPT utility in healthcare based on 22 influential records.

AI: Artificial intelligence.

DISCUSSION

In the current study, a comprehensive analysis of the leading ChatGPT-related healthcare publications showed three primary trajectories for future research in this emerging subject. First, in healthcare education, the findings highlighted the promising role of ChatGPT as an example of generative AI models for tailoring educational experiences to individual student needs which can facilitate a personalized and effective learning environment [2,5,54]. Additionally, the potential of ChatGPT to generate detailed and relevant clinical simulations represents an affordable opportunity for dynamic educational experiences especially in low-income settings [55,56]. Moreover, ChatGPT has the potential to aid in developing and enhancing the communication skills among health students [54]. In turn, this can help to improve aspects like empathy and patient-centered communication, which are considered essential outcomes in healthcare education for development of competent health professionals [57]. Therefore, future research in this area is recommended to concentrate on exploring ChatGPT capabilities to maximize educational outcomes. Additionally, it is important to explore ChatGPT integration into the existing curricula in health schools, while evaluating its effectiveness in comparison to traditional pedagogical teaching

methods [6,35,36,51,55,58].

Second, in healthcare practice ChatGPT emerged as a valuable generative AI tool that can be used to enhance workflow efficiency and patient communication [5,43,59,60]. ChatGPT potential extends to facilitate medical diagnoses and treatment planning, while simultaneously reducing the burden of routine tasks of health professionals especially in low-income settings [56,61]. Therefore, future research into these areas should focus on real-life examples of how ChatGPT as an example of generative AI models can help in streamlining the clinical operations, and enhance patient engagement [39,40,43,46,48,52,62,63].

Third, the incorporation of ChatGPT in healthcare research can pave the way for a new era of innovation coupled with enhanced efficiency [2,5]. For example, ChatGPT can be utilized as an aid in academic writing (e.g., preparation of grant proposals, manuscript preparation) [5,64]. Consequently, ChatGPT among other generative AI models tailored for such a purpose can enhance the speed of formulating complex scientific ideas [65]. Moreover, ChatGPT has capabilities to conduct comprehensive literature reviews and summarize key findings, which would be highly beneficial to manage the ever-expanding health literature [2,5,66]. Furthermore, ChatGPT utility extends to

involve areas such as data analysis and code generation [2,5]. Based on the recommendations of the influential papers identified in this study, future research should focus on striking the optimal balance between AI assistance and human expertise to ensure the reliability and integrity of research outcomes [38,41,42,44,45,53,67].

In the three healthcare-related aspects (education, practice, and research), most of the included publications in this study highlighted the possible shortcomings and challenges associated with integration of ChatGPT in healthcare [5,17,22]. These challenges revolved around the generation of inaccurate content and possible “hallucinations” [38,45,68], the ethical, and transparency issues as well as the potential biases [5,69]. A compilation of the included publications advocated for the importance rigorous content checking and research on its performance and ethical aspects [5,41,48,52,53,70,71].

One of the interesting areas for future research is the exploration of ChatGPT potential in enhancing healthcare education [5,35,36,54,72]. Future studies should focus on long-term, controlled comparisons between medical students utilizing ChatGPT and those relying on traditional methods [35,73]. This research must include not only academic performance but also cost-effectiveness, aiming to elucidate the economic value of ChatGPT as an educational tool as elaborated on by Kung et al. [35]. There is also a need to re-evaluate the suitability of the traditional assessment tools in medical education with a shift towards approaches that involve critical thinking [5,6,51,74].

One interesting area that needs exploration is the utility of ChatGPT as an academic editor or peer reviewer allowing for efficient handling of the scientific manuscripts in healthcare which is a burden for the scientific community [5,75]. In addition, the utility of ChatGPT as an aid in medical writing necessitates the development of stringent use and evaluation policies to maintain the scientific integrity, including the integration of ChatGPT use detection tools in the editorial processes [5,38,40-42,49,76].

Furthermore, the application of ChatGPT in patient interaction, communication, and engagement whether through medical report generation, health advocacy communications, or self-diagnosis must be carefully examined [2,19,40,50,77-79]. Investigation into patient preferences regarding ChatGPT assistance versus the traditional human support will also be a critical aspect to guide its implementation in healthcare [5,39]. Among the

risks that needs further evaluation is the potential of ChatGPT to generate infodemics necessitating comprehensive guidelines for ChatGPT use in healthcare [42,47].

Additionally, future research should prioritize establishing standard methodologies for design and reporting to ensure the reliability and credibility of assessing ChatGPT performance in various healthcare settings [50,80-82]. This includes the need to benchmark the level of intelligence of ChatGPT [37,41].

Moreover, the future of ChatGPT in healthcare will be shaped by its concordant integration with the indispensable human expertise [5,46,83]. Training healthcare professionals and students in judicious and ethical ChatGPT use, developing rigorous quality standards, and involving all stakeholders in identifying optimal use strategies will be vital to maximize the benefits of ChatGPT in healthcare while mitigating its associated risks [47,48,52,84].

Lastly, it would be interesting to investigate how the recent developments of text-to-video AI generators will make it into healthcare, e.g. for generating educational videos or to plan for varying healthcare scenarios in advance via generating relevant videos [85].

The limitations of the current study should be highlighted and considered carefully in interpretation of the findings. First, the study relied on the top ten cited ChatGPT-related healthcare publications which introduces an element of selection bias which was also related to the evaluation of the included records by a single author. Despite being influential, the included records may not necessarily be representative of the full spectrum of record quality in the emerging research topic of ChatGPT utility in healthcare. Regarding the database coverage, while the inclusion of Scopus, Web of Science, and Google Scholar databases can provide a comprehensive coverage of the records, this approach may have resulted in missing a few relevant references, leading to an incomplete representation of the research subject. Additionally, the specific search terms used may not capture all relevant studies, especially those using different terminologies or keywords.

CONCLUSIONS

The key role of ChatGPT as an example of generative AI models in revolutionizing healthcare was manifested in the rapid growth of literature in this subject. ChatGPT can contribute substantially in healthcare practice via enhancing the clinical workflow and patient engagement as well as the its

potential benefit to improve health literacy. It can also reshape healthcare education, facilitating personalized learning and improving the communication skills of students. ChatGPT can also serve as a key tool in healthcare research, aiding in academic writing with efficient literature reviews, data analysis, and management.

However, the integration of ChatGPT among other AI models in healthcare must be approached with caution, considering potential challenges such as the generation of inaccurate content, ethical challenges, and inherent biases. To ensure effective and ethical use of ChatGPT in healthcare, future research should focus on establishing rigorous methodologies for design, implementation, and reporting. This will enhance the reliability and credibility of ChatGPT applications in diverse healthcare settings that would be guided by robust evidence. Furthermore, for successful implementation of ChatGPT in healthcare, it is important to adopt a multidisciplinary approach that involves collaboration among AI developers, computer scientists, healthcare professionals, educators, and ethicists. Such collaboration is important to address the multifaceted nature of AI applicability in healthcare and to responsibly guide its use.

Recognizing the urgency and significance of this research area, the *Jordan Medical Journal (JMJ)* has launched a special issue titled "Evaluating

Generative AI-Based Models in Healthcare". This initiative aims to address the existing challenges and shed light on novel perspectives in this rapidly evolving field as a timely effort to advance the collective understanding of generative AI's role in healthcare. This opportunity offers a platform for innovative research contributions that can help to shape the future of healthcare education, practice, and research.

Author Contributions

Conceptualization, M.S.; methodology, M.S., A.A.-F., J.E.; validation, M.S., A.A.-F., J.E.; formal analysis, M.S., A.A.-F., J.E.; investigation, M.S., A.A.-F., J.E.; data curation, M.S., A.A.-F., J.E.; writing—original draft preparation, M.S.; writing—review and editing, M.S., A.A.-F., J.E.; visualization, M.S.; supervision, M.S., J.E.; project administration, M.S. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

The data presented in this study are available on request from the corresponding author (M.S.).

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تصور مستقبلي لبرنامج تشات جي بي تي في مجال الرعاية الصحية: رؤى وتوصيات من المراجعة المنهجية للأبحاث المؤثرة ودعوة لتقديم الأوراق البحثية

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الملخص

الخلفية والأهداف: يمثل برنامج تشات جي بي تي نموذجاً للذكاء الاصطناعي التوليدي الأكثر شيوعاً و استخداماً وقد حظي باهتمام كبير في مجال أبحاث الرعاية الصحية. كان الهدف من الدراسة الحالية هو تقييم المسار المستقبلي للبحث المطلوب في هذا المجال بناءً على توصيات أهم السجلات المنشورة المؤثرة.

المواد والطرق: تم إجراء بحث منهجي على باستخدام قواعد بيانات سكوبس، ويب أوف ساينس و غوغل سكولار في الفترة (27-30 نوفمبر 2023) لتحديد أفضل عشرة سجلات منشورة ذات الصلة ببرنامج تشات جي بي تي في مجال الرعاية الصحية عبر قواعد البيانات الثلاث. تم تصنيف السجلات على أنها ذات أعلى تأثير في هذا المجال بالاعتماد على عدد الاستشهادات.

النتائج: تم تحديد إجمالي 22 سجلاً فريداً من 17 مجلة مختلفة تمثل 14 ناشراً مختلفاً كأفضل المنشورات ذات الصلة ببرنامج تشات جي بي تي في موضوع الرعاية الصحية. بناءً على توصيات السجلات المحددة، ظهرت المواضيع التالية كمجالات مهمة يجب مراعاتها في أبحاث تشات جي بي تي المستقبلية في مجال الرعاية الصحية: تحسين تعليم الرعاية الصحية، وتحسين كفاءة العمليات السريرية (مثل التوثيق)، ومعالجة المخاوف الأخلاقية (مثل خصوصية المريض وموافقته). ودعم المهام البحثية (مثل تحليل البيانات وإعداد المخطوطات)، والتخفيف من تحيزات مخرجات برنامج تشات جي بي تي، وتحسين تعليم المرضى ومشاركتهم، وتطوير بروتوكولات تقييم موحدة لبرنامج تشات جي بي تي في الرعاية الصحية.

الاستنتاجات: سلطت المراجعة الحالية الضوء على المجالات الرئيسية التي يجب تحديد أولوياتها في تقييم فائدة برنامج تشات جي بي تي في الرعاية الصحية. هناك حاجة إلى تعاون متعدد التخصصات ومنهجيات موحدة لتجميع أدلة قوية في هذه الدراسات. بناءً على هذه التوصيات والإمكانات الواعدة لبرنامج تشات جي بي تي في مجال الرعاية الصحية، أطلقت المجلة الطبية الأردنية دعوة لتقديم أوراق بحثية لعدد خاص في المجلة بعنوان "تقييم النماذج التوليدية القائمة على الذكاء الاصطناعي في الرعاية الصحية".

الكلمات الدالة: الذكاء الاصطناعي؛ المحولات التوليدية المدربة مسبقاً؛ معالجة اللغة الطبيعية؛ تعليم الرعاية الصحية؛ القياسات البليومترية.