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ChatGPT Applications in Nursing: Current Status and Future Perspectives

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ABSTRACT

Aim: With the rapid advancement of generative artificial intelligence technologies, natural language processing tools represented by ChatGPT have been increasingly used. This narrative review explored the application, challenges, and future directions of ChatGPT in nursing.

Design: Narrative review.

Methods: The searches were conducted in PubMed, Web of Science and Google Scholar. The empirical studies of ChatGPT in nursing were selected and explored.

Results: ChatGPT has been integrated into clinical nursing support, nurse education and patient service optimisation, demonstrating potential in improving efficiency and patient outcomes. However, technical limitations, ethical-legal issues and implementation barriers pose challenges to its widespread adoption. In future, technology iteration, standard development and multimodal convergence are needed to promote the construction of trusted artificial intelligence nursing systems.

Patient or Public Contribution: This narrative review is based on a secondary analysis of existing literature and does not directly involve patient or public contributions.

1 | Introduction

Nursing, as an important part of the healthcare system, has long faced serious challenges such as a shortage of human resources and excessive workload. World Health Organization data show that the global shortage of nurses is highly projected to reach 4.5 million by 2030, severely constraining the accessibility and quality of healthcare services (Boniol et al. 2022). At the same time, factors such as population aging and the increasing burden of chronic diseases further exacerbate the demand for nursing services. Therefore, exploring how to use generative artificial intelligence to enhance nursing efficiency, optimise nursing quality and improve patient experience has become an important issue in the global healthcare field.

ChatGPT (Open Ai, USA), as a deep learning-based natural language processing model, is capable of understanding and generating human-like texts. Its powerful language comprehension, broad knowledge coverage and continuous learning properties make it a highly promising technological tool in the nursing field (Ni et al. 2024). ChatGPT assists in clinical decision making (Saban and Dubovi 2024), optimises patient education (Kleebayoon and Wiwanitkit 2023), improves nursing management and supports nursing research (Kim et al. 2024). It is making a transformative impact on all aspects of nursing practice.

The aim of this narrative review is to discuss the current status of ChatGPT application in nursing, the challenges it faces and the direction of its future development, to promote the rational

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application and healthy development of ChatGPT technology in nursing, and ultimately to achieve the goal of enhancing the quality of nursing services and improving the health outcomes of patients.

2 | Applications of ChatGPT in Nursing

2.1 | Clinical Nursing Support

ChatGPT integrates into the nursing workflow to improve work efficiency. Its natural language processing technology can efficiently parse unstructured text in electronic medical records, automatically extract key information such as patient history, medication records, and laboratory results, and generate structured summaries (Bhuyan et al. 2025; Scerri and Morin 2023). Studies have demonstrated that the application of ChatGPT in intensive care units and general wards significantly improved the efficiency and accuracy of nursing documentation, cutting the recording time from 15 min to approximately 5 min per patient document without sacrificing quality (Chen et al. 2024).

ChatGPT can generate dynamic care recommendations by integrating evidence-based medical guidelines with real-time patient data. A cross-sectional study showed that in emergency triage scenarios, ChatGPT can output preliminary risk assessment grading and care prioritisation recommendations based on semantic analysis of patients' chief complaint symptoms and vital signs, combined with a pre-trained medical knowledge base (Colakca et al. 2024). Another comparative study showed that ChatGPT outperformed traditional nurse triage in identifying high-risk patients (Arslan et al. 2024). Notably, ChatGPT's output recommendations need to be validated by nursing staff's clinical judgement to circumvent the risk of misclassification due to modelling illusions.

Personalised care plan construction is the direction of ChatGPT's advanced application. By analysing multidimensional patient data, ChatGPT can generate dynamically adjusted care plans. A comparative study showed that ChatGPT-4 provided nursing diagnoses, interventions and related recommendations for patients with preterm labour and gestational diabetes that were comparable to care plans developed by a team of nurses (Johnson et al. 2025). In addition, ChatGPT enabled automated generation of personalised dietary recommendations and glucose monitoring protocols in diabetes management (Zheng et al. 2024). However, the reliability of ChatGPT applications is highly dependent on data quality and algorithm transparency.

2.2 | Nurse Education Training

As a virtual teaching assistant, it effectively solves the problem of time and space constraints in traditional teaching and significantly improves teaching efficiency. A mixed study of doctoral nursing students showed that ChatGPT's assistance was able to accelerate the progress of course tasks (Reading Turchioe et al. 2024). Additionally, ChatGPT demonstrated more rigorous standards than human reviewers in automated assessment of senior nursing students' dissertations and quickly enabled students to receive personalised feedback (Parker et al. 2023).

Clinical simulation training has been revolutionised by ChatGPT (Liu et al. 2023). Studies have shown that ChatGPT as a virtual patient in nursing simulation training helped prepare nursing students for interaction with real patients (Benfatah et al. 2024). Another systematic review noted that with ChatGPT simulated patient conversations and clinical situations, students were able to improve communication skills and clinical decision-making (Kucukkaya et al. 2024). Of note, ethical risk control is particularly important. Feedback mechanisms for incorrect practice need to be established to prevent the modelling of erroneous clinical thinking.

Personalised learning path design highlights ChatGPT's data-driven advantages. Through machine learning to analyse students' knowledge graph gaps and skill mastery curves, ChatGPT can dynamically adjust the difficulty gradient and presentation of teaching content. A quasi-experimental study showed that integrating ChatGPT into nursing education curriculum design can effectively address the shortcomings of insufficient personalised feedback in traditional nursing education and improve the problem-solving ability of nursing student (Chang et al. 2024).

2.3 | Patient Service Optimization

ChatGPT reshapes the patient service ecosystem through intelligent interactions. It generates evidence-supported nursing recommendations by dynamically parsing patient complaints. A randomised blinded survey evaluation showed that ChatGPT was consistent with the recommendations of nurse specialists in an emergency department discharge guidance scenario (Huang et al. 2024). In the field of chronic disease management, ChatGPT enabled personalised intervention plan adjustment for diabetic patients by dynamically analysing structured data such as patient glucose logs and diet records (Zheng et al. 2024).

Rehabilitation coaching services are transformed with precision due to ChatGPT's intervention. ChatGPT integrated real-time physiological data transmitted by wearable devices with patient self-reported functional status to generate dynamic rehabilitation training programs (You et al. 2024). A comparative analysis study indicated that ChatGPT provided personalised exercise prescriptions and shortened the rehabilitation cycle for hypertensive co-morbid patients (Xu et al. 2024). In the area of medication adherence monitoring, ChatGPT can identify potential patterns of non-adherent behaviour and trigger hierarchical intervention mechanisms by analysing semantic features of patients' medication feedback (Ruksakulpiwat et al. 2024).

Multilingual translation features of ChatGPT significantly improve the quality of cross-cultural care. ChatGPT contextualised medical terminology through deep neural networks to effectively enhance services for non-native-speaking patients (Gulati et al. 2024). However, the risks of semantic bias due to language and cultural differences need to be cautioned, especially in sensitive scenarios such as symptom description and pain assessment. It is recommended to establish a collaborative review mechanism for bilingual caregivers.

3 | Challenges of ChatGPT in Nursing

3.1 | Technical Limitations

While the use of ChatGPT in nursing practice shows significant potential, the inherent flaws in its technical architecture pose substantial challenges to clinical safety and reliability. The modelling illusion, as a core problem, stems from the underlying mechanisms of generative AI that may lead to fictional care recommendations (Woo et al. 2024). The study showed that ChatGPT lacked transparency in collecting data to answer questions about clinical care issues and could even fabricate false information that seemed plausible. Moreover, its output was often presented in highly assertive language, exacerbating the risk of clinical misinformation (Branum and Schiavenato 2023). Therefore, there is a need to develop healthcare-specific fine-tuning models (e.g., NurGPT) to reduce the risk of hallucinations through domain knowledge distillation.

The lag in knowledge updating further diminishes their clinical applicability. The disconnect between the iterative cycle of medical guidelines and the retraining cycle of models leads to a deviation of their recommendations from the latest standards. Studies have reported that the medical information provided by ChatGPT was only 60% concordant with the latest clinical guidelines (Walker et al. 2023). This lag is particularly dangerous in rapidly changing infection control and emergency care. The forward-looking path to technology optimisation needs to focus on building a dynamic knowledge graph that enables real-time synchronisation of guideline updates with model parameters.

The lack of contextual understanding and multimodal processing capabilities limits its application in complex care scenarios. Currently, ChatGPT relies primarily on textual data, which limits its ability to fully utilise the diagnostic potential of visual information (Hirosawa et al. 2024). In areas that rely on visual assessment, such as wound care, ChatGPT's grading judgement of the degree of wound infection is far below clinical requirements. In addition, ChatGPT's flawed understanding of cultural contexts may exacerbate health inequalities and lead to biased care practices. In the future, there is a demand for advancing multimodal federated learning to improve cross-agency model performance while safeguarding data privacy.

The shortage of emotion calculation and empathy ability is another key shortcoming. In nursing practice, patients' emotional state directly affects treatment adherence. However, ChatGPT has insufficient accuracy in recognising emotions such as anxiety and depression, and is unable to generate communication strategies with humanistic care. In sensitive scenarios such as end-of-life care, this shortcoming may lead to alienation of the nurse–patient relationship and even ethical controversies. Therefore, it is necessary to introduce training data rich in emotion and empathic expressions by integrating advanced sentiment analysis algorithms in order to improve the model's ability to understand and respond to sentiment.

3.2 | Ethical-Legal Issues

ChatGPT's application to nursing practice has spawned a multidimensional ethical-legal dilemma. One of the primary ethical concerns associated with ChatGPT in nursing is the issue of patient confidentiality. ChatGPT is designed to process and analyse large amounts of data, which may include sensitive patient information. According to Wang et al. (2023), the potential for data breaches and unauthorised access posed a significant risk to patient privacy. Nurses using ChatGPT must ensure that the technology complies with regulations such as the General Data Protection Regulation (GDPR) and the Health Insurance Portability and Accountability Act (HIPAA) to safeguard patient confidentiality.

Another ethical issue is the potential for bias in ChatGPT. As highlighted by Kleib, ChatGPT may inadvertently perpetuate and amplify biases present in its training data (Kleib et al. 2024). In nursing, this may lead to unfair treatment or disparities in patient care. Nurses must be vigilant in monitoring and addressing the potential biases of ChatGPT to ensure fair and ethical care for all patients.

Also, academic integrity is an ethical concern in nursing education. When students outsource their academic responsibilities to ChatGPT, the line between their own work and machine output becomes blurred, raising questions about ownership of ideas and authenticity of the educational process (Sebach and Leach 2024). In addition, plagiarism may increase due to the difficulty of tracking and detecting ChatGPT-generated text. To address these challenges, educational institutions must clarify the use of ChatGPT in academic work and clear the boundaries of acceptable practice. Further, curricula should be revised to include discussions on the ethics of technology use, emphasising the importance of intellectual property rights and the value of authentic learning experiences.

Furthermore, the use of ChatGPT in nursing raises questions about accountability. As Abdulai pointed out, it was often unclear who should be held accountable when ChatGPT systems make mistakes or cause harm (Abdulai and Hung 2023). Nurses, as primary caregivers, may face legal and ethical dilemmas when relying on ChatGPT-generated recommendations. It is critical to develop clear guidelines and frameworks for assigning responsibility and to ensure that ChatGPT is used as a tool to support, not replace, clinical judgement.

3.3 | Implementation Barriers

The implementation of ChatGPT in nursing practice faces significant barriers that need to be addressed to ensure the effective integration of this technology. One of the primary obstacles is the uneven acceptance of the technology by healthcare professionals. Zhou noted that fear of job displacement and the potential for ChatGPT to undermine compassion in nursing can trigger resistance (Zhou et al. 2024). To address this issue, targeted educational programs and workshops can be implemented to increase nurses' understanding of the benefits of AI and to alleviate concerns about the encroachment of the technology.

In addition, integrating ChatGPT into existing healthcare systems is fraught with compatibility issues. The heterogeneity of IT infrastructures in different healthcare organisations can hinder the seamless integration of AI tools (Ali et al. 2025). To overcome this problem, a standardised AI integration framework should be developed to ensure that ChatGPT can be easily adapted to various electronic health record systems and other healthcare technologies.

Furthermore, the ongoing operation and maintenance costs of ChatGPT are significant. The financial burden of updating algorithms, training staff and ensuring data security can be overwhelming for many healthcare organisations. To mitigate this issue, a cost–benefit analysis should be conducted to demonstrate the long-term economic advantages of implementing ChatGPT. Also, public and private sector partnerships could be sought to fund the ChatGPT programme, thereby alleviating the financial pressure on individual healthcare organisations.

4 | Future Directions

4.1 | Technology Evolution Path

The future trajectory of ChatGPT in nursing care is poised to be shaped by the convergence of advanced technologies, each contributing to a more sophisticated and patient-centric approach to healthcare. One pivotal direction is the development of multimodal interaction systems. By integrating voice, touch and visual interfaces, these systems can enhance the communication between patients and healthcare providers, enabling a more intuitive and responsive care environment. In parallel, the integration of real-time vital signs data into ChatGPT's decision-making algorithms is set to revolutionise continuous patient monitoring. By leveraging wearable technology and devices, nurses can receive instant updates on a patient's physiological status, allowing for proactive interventions. Furthermore, the fusion of affective computing technologies with ChatGPT holds the promise of a more empathetic and emotionally intelligent nursing care. By interpreting and responding to patients' emotional states, such systems can tailor interactions to individual needs, thereby enhancing the patient experience.

4.2 | Application Scenario Expansion

The expansion of ChatGPT's application in nursing will set to revolutionise various aspects of healthcare delivery. In the realm of community-based care, ChatGPT has the potential to serve as a pivotal tool for supporting home nursing. By providing real-time guidance and monitoring, ChatGPT can empower patients and caregivers to manage health conditions effectively in a home setting. In the context of disaster medical response, ChatGPT's adaptability and scalability make it an invaluable asset. It can be deployed to assist in triage, patient tracking and resource allocation during emergencies, thereby enhancing the efficiency and effectiveness of disaster response efforts. Furthermore, the application of ChatGPT in interdisciplinary consultation systems holds promise for fostering a more collaborative and integrated approach to patient care. By facilitating seamless communication and knowledge sharing among various healthcare professionals, ChatGPT can support more comprehensive and holistic care plans.

4.3 | Policy and Standard Setting

The integration of ChatGPT in nursing necessitates a robust policy and standards framework to ensure ethical deployment and effective human-AI collaboration. The construction of a medical AI ethical framework is paramount in guiding the development and implementation of ChatGPT in nursing practice. This framework must address issues such as patient privacy, data security and the equitable distribution of AI benefits. Concomitantly, the development of a certification system for nursing AI is essential to validate the safety and efficacy of ChatGPT applications. This system would serve as a quality assurance mechanism, ensuring that AI tools meet the specific needs and standards of nursing care. Furthermore, the formulation of guidelines for human-AI collaboration is critical in delineating the roles and responsibilities of both nurses and AI systems. These guidelines must be designed to enhance teamwork, clarify decision-making processes and ensure that AI complements rather than replaces human expertise.

5 | Conclusion

ChatGPT represents a transformative tool with the potential to revolutionise nursing care by enhancing efficiency, optimising education and personalising patient services. Despite its promising applications, the path to integration is fraught with technical, ethical and practical hurdles. Addressing these challenges requires a multifaceted approach, including the development of advanced multimodal systems, the integration of real-time vital signs data, and the fusion of affective computing. Moreover, the establishment of a comprehensive policy and standards framework is essential to ensure the ethical and effective use of ChatGPT in nursing. As generative artificial intelligence continues to evolve, the nursing industry must be actively involved in its development and deployment to meet the complex needs of patients and the healthcare system as a whole.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The authors have nothing to report.

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