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Evaluating the Role of ChatGPT in Health Information Provision: Capabilities, Limitations, and Ethical Implications

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Abstract: This study provides a critical analysis of ChatGPT's strengths and weaknesses as a resource for delivering health-related information, emphasizing its potential for both general advice and tailored health guidance. Through a systematic review and expert analysis, the study highlights ChatGPT's ability to deliver immediate and accessible information on a wide range of health topics, including nutrition and chronic disease management. While its conversational interface and capacity for personalization make it a valuable resource for users seeking initial advice, significant limitations are evident in its handling of complex and nuanced health scenarios. These shortcomings are primarily attributed to gaps in its training, including outdated data and potential incorporation of unverified sources. The findings emphasize the importance of recognizing ChatGPT as a supplementary tool rather than a replacement for professional healthcare consultation. Ensuring user safety requires ongoing updates to its training datasets, integration of the latest scientific evidence, and the establishment of clear guidelines for its application in healthcare settings. The study underscores the critical role of qualified professionals in verifying and contextualizing AI-generated advice, particularly in complex or high-risk cases. Future research and development are essential to enhance ChatGPT's reliability, accuracy, and effectiveness, ensuring its optimal contribution to health information dissemination while maintaining the highest standards of safety and ethics.

Keywords: Health information, ChatGPT, Professional healthcare, Patient safety

Introduction

In recent years, advancements in artificial intelligence (AI) have revolutionized the accessibility and delivery of health-related information. Modern technologies now provide users with instant access to comprehensive resources, aiding in disease prevention, symptom identification, and overall wellness. Among these innovations is ChatGPT, an AI-powered conversational agent developed by OpenAI. ChatGPT utilizes advanced machine learning algorithms to generate relevant and personalized responses based on user input, simulating human-like interactions through text-based communication (Introducing ChatGPT, 2022).

This technology has gained significant attention for its ability to provide general health guidance, making information more accessible to a global audience. However, despite its potential benefits, ChatGPT has notable limitations that must be considered when evaluating its reliability as a health resource.

Strengths of ChatGPT in Health Information Provision

One of the key advantages of ChatGPT is its ability to provide round-the-clock access to general health information. Unlike traditional healthcare systems that require appointments and waiting times, ChatGPT offers

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immediate responses to user queries. This feature is particularly beneficial for individuals facing barriers to healthcare access, such as those living in remote areas, those with time constraints, or those who feel hesitant to seek professional medical advice due to personal concerns (Morita et al., 2023; Li et al., 2023).

Additionally, ChatGPT serves as an introductory resource for those seeking foundational knowledge on common illnesses, preventive healthcare practices, and lifestyle recommendations. By providing easily digestible information, it empowers users to make informed decisions about their health and wellness. This is particularly valuable in public health education, where AI-driven chatbots can assist in disseminating information on topics such as vaccinations, nutrition, mental health, and chronic disease management (Chatelan et al. 2023).

Another major strength of ChatGPT is its interactive and user-friendly design. The AI's ability to process natural language inputs and deliver personalized responses makes it a highly accessible tool for diverse populations. Users can engage with the chatbot in multiple languages and across various platforms, ensuring a broad reach. The convenience of having free, on-demand health guidance also enhances its appeal, especially for those seeking preliminary insights before consulting a medical professional (Ponzo et al., 2024).

Weaknesses and Limitations of ChatGPT in Healthcare Contexts

Despite its advantages, ChatGPT has inherent limitations that prevent it from serving as a reliable standalone healthcare solution. First and foremost, AI lacks the ability to conduct real-time medical assessments. Unlike physicians and specialists, ChatGPT cannot analyze vital signs, perform physical examinations, or access patient medical histories. This makes it unsuitable for diagnosing conditions or offering personalized medical treatment plans (Chatelan et al. 2023; Wang et al., 2023; Tripathi & Chandra, 2023).

Moreover, the reliability of ChatGPT's health-related responses is a significant concern. While the AI is trained on extensive datasets, it has a knowledge cutoff, meaning it may provide outdated, incomplete, or even inaccurate information. This is a critical flaw in medical contexts, where precision and up-to-date knowledge are essential. The risk of misinformation can have serious consequences, particularly for individuals seeking urgent medical advice or guidance on managing chronic conditions (Safranek et al., 2023; Liaw et al., 2023).

Linguistic ambiguities further compound the problem. Since ChatGPT relies on interpreting user queries through natural language processing, it may misinterpret vague or poorly structured questions. This can lead to misleading recommendations, which, in a healthcare setting, could result in inappropriate self-treatment or unnecessary anxiety for the user (Morita et al., 2023). Additionally, AI-generated content does not always distinguish between general advice and case-specific medical recommendations, creating potential risks for those who rely on the chatbot for critical health decisions.

Privacy concerns arise when using ChatGPT for health-related inquiries, particularly in terms of data security and confidentiality. While OpenAI has implemented safeguards, ChatGPT does not encrypt conversations end-to-end, meaning that sensitive health information shared by users could be stored or accessed under certain conditions. Additionally, since the AI lacks the ability to differentiate between general queries and personally identifiable medical details, users may unknowingly disclose private health information without proper protection in place. This highlights the need for caution when discussing personal medical history or conditions via AI-driven tools. Users may not always be aware of how their data is handled, raising ethical concerns regarding confidentiality and data security (Thirunavukarasu et al., 2023; Komorowski et al., 2023; Arslan, 2023). This highlights the importance of ensuring AI compliance with stringent health data protection regulations.

Risk Mitigation and the Need for Caution

To mitigate some of these risks, ChatGPT explicitly states that its health-related responses should not be used as a substitute for professional medical advice. In this regard, a study found that almost half of the available online health information related to nutrition was either inaccurate - 48.9%, or of low quality - 48.8% (Denniss et al., 2023). This highlights the need for users to be cautious when relying on AI- driven tools for medical guidance. Healthcare professionals and regulatory bodies must also play a role in guiding the responsible use of AI in health communication.

Study Aim

Given the growing reliance on AI for health information, this systematic review critically assesses ChatGPT's effectiveness, safety, and reliability in delivering health-related advice. To ensure specificity and avoid dilution of the analysis, this study focuses exclusively on ChatGPT's role in providing safe health information related to nutrition and dietary regimens for individuals with chronic diseases. By analyzing its strengths and limitations within this context, this review aims to offer insights into how AI-powered chatbots can complement, rather than replace, professional healthcare services, ensuring that users receive accurate and responsible nutrition-related health information.

Materials and Methods

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure methodological rigor, transparency, and reproducibility (Page et al., 2021).

Study Selection

A comprehensive literature search was conducted in the Scopus and Web of Science databases during January–February 2025. The search strategy employed keywords such as "*ChatGPT* AND *nutrition*" and subsequent terms including "*health*" to identify studies evaluating ChatGPT's capabilities and limitations in generating health-related nutritional information for diverse health conditions (accounting for health status, preferences, and goals). Initial research identified 30 full-text articles and 10 conference reports in Scopus, and 71 full-text articles on the Web of Science.

Eligibility Criteria

Inclusion criteria:

1. Open-access, full-text publications (articles or conference reports).
2. Studies focused on ChatGPT's application in nutrition, dietary regimens, or health-related information generation.
3. Publications addressing contextual factors such as health conditions, user preferences, or clinical goals.

Exclusion criteria:

1. Duplicate publications.
2. Non-open-access articles.
3. Conference abstracts, short communications, or non-peer-reviewed materials.
4. Studies unrelated to ChatGPT's role in nutrition or health contexts.

Data Analysis

The selection process involved three stages:

1. **Duplicate removal**: Cross-referencing results from Scopus and Web of Science revealed significant overlap. After removing duplicates, 55 publications remained.

2. **Open-access screening**: Only 32 of the 55 publications were freely accessible and underwent content analysis.

3. **Content screening**: A final subset of 8 articles directly aligned with the study's objectives (see Figure 1). These were critically analyzed to evaluate ChatGPT's strengths, limitations, and applicability in generating nutrition-related health information.

This structured approach ensured a rigorous, unbiased synthesis of evidence on ChatGPT's role in nutrition and health contexts.

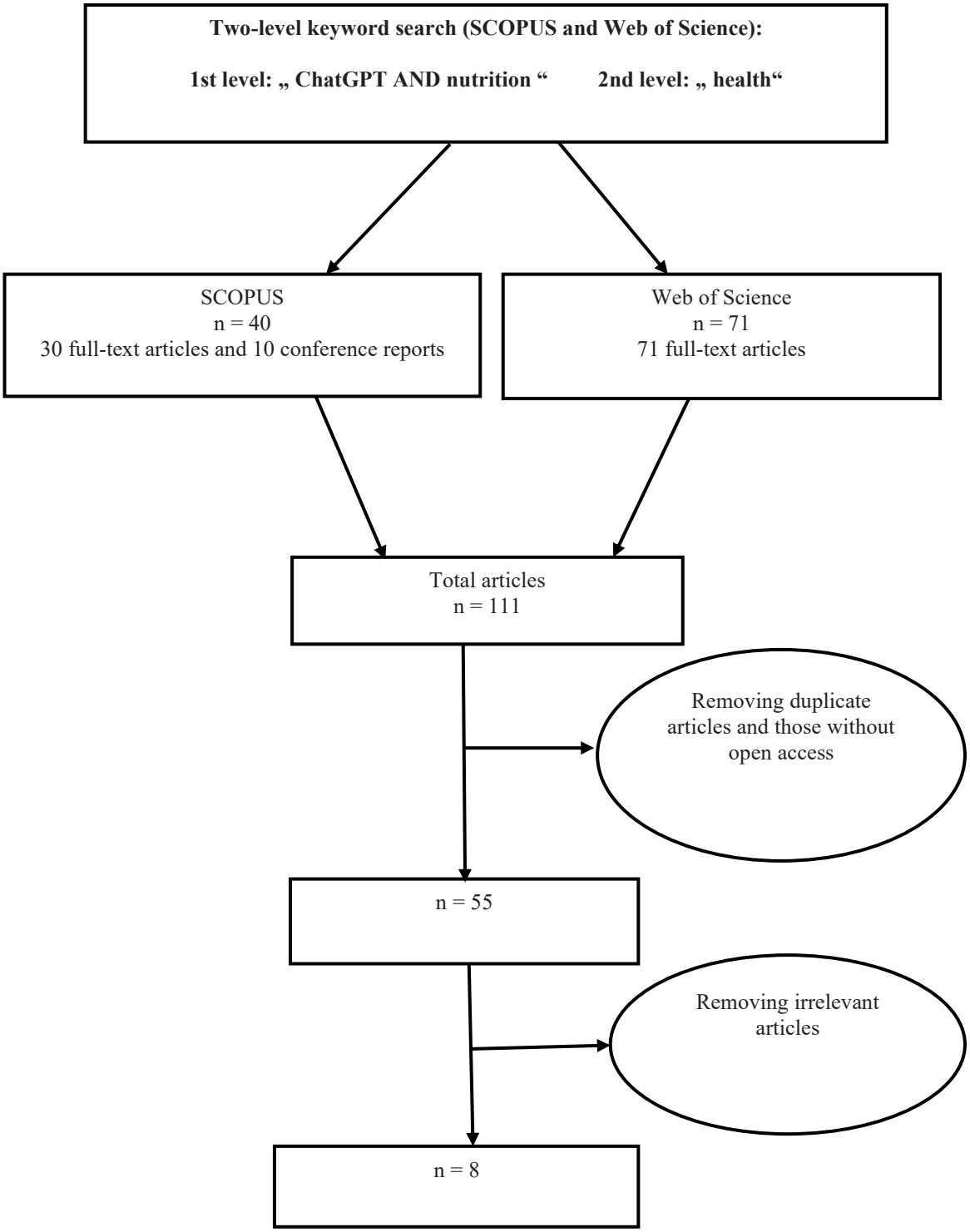

Figure 1. Stages of scientific publication selection.

The diagram illustrates the screening process, including duplicate removal, open-access filtering, and relevance-based exclusion of articles.

Results and Discussion

The studies included in the analysis showed quite contradictory results. Table 1 summarizes the main findings from them.

Table 1. Synthesized summary of studies on ChatGPT's role in dietary and health information

Study	Objective	Key Findings	Conclusion
Chatelan et al. 2023	Assess ChatGPT's impact on dietitians' work and risks of AI-generated advice.	- **Accuracy**: Provides dietary advice for conditions like type 2 diabetes but with inconsistencies and incomplete plans. - **Hallucinations**: Generates plausible but factually incorrect responses. - **Professional impact**: Risks reduced patient interaction and reliance on unqualified advice.	ChatGPT has potential to support dietitians but requires oversight due to risks of misinformation and reduced patient engagement.
Kirk et al. 2023	Compare ChatGPT's answers to dietitians' responses to common dietary queries.	- ChatGPT outperformed dietitians in **scientific correctness** (5/8 questions), **clarity** (5/8), and **practicality** (4/8) in general dietary advice.	ChatGPT matches or exceeds dietitians in answering common dietary questions but lacks nuanced clinical judgment.
Sun et al. 2023	Test ChatGPT's ability to pass China's registered dietitian exam.	- Accuracy: 60.5% (ChatGPT) vs. 74.5% (GPT-4). - Overlap with expert recommendations: 80.7% (non-recommended foods), 94.9% (recommended foods).	Limited use recommended; AI should supplement, not replace, expert-validated dietary advice.
Ponzo et al. 2024	Evaluate ChatGPT's dietary advice for non-communicable diseases (NCDs).	- **Accuracy**: 55.6–73.3% "appropriate" advice across conditions (e.g., hypertension, obesity). - Errors in complex cases (e.g., omega-3 fatty acids recommendations for liver disease).	Effective for general NCD advice but struggles with personalized strategies, necessitating expert consultation.
Papastratis et al. 2024	Compare AI-generated meal plans with knowledge-based systems.	- **Caloric accuracy**: ChatGPT had >19% deviation vs. 0.8% for expert systems. - **Diversity**: ChatGPT-3.5 offered the most varied meal plans (6.58 vs. 4.89).	ChatGPT shows promise for diverse meal planning but requires refinement for clinical accuracy.
Kim et al. 2024	Assess AI-generated weight-loss plans vs. clinical protocols.	- **Safety**: Highest-rated aspect (6.53/10). - Experts could not distinguish AI vs. human plans in blind evaluation.	AI-generated plans are promising but need validation before clinical adoption.
Liao et al. 2024	Evaluate ChatGPT's dietary advice for students' nutritional literacy.	- **Readability**: High scores. - **Completeness**: Lacking in practical advice. - **Accuracy**: 84.38% in literacy tests.	Suitable as an educational tool but requires improvements in practical applicability and completeness.
Papastratis et al. 2024	Develop an AI system for personalized weekly meal plans.	- **Accuracy**: 87% (virtual profiles), 84.19% (real profiles). - Effectively combines user data (health, activity) for tailored plans.	AI-based systems outperform traditional models, offering balanced and diverse meal plans aligned with expert guidelines.

The integration of artificial intelligence (AI) in dietary guidance has shown promising yet inconsistent results. ChatGPT, as a widely used AI tool, demonstrates capabilities in generating general dietary recommendations but falls short in providing precise, individualized advice for complex medical conditions. Several studies highlight both the strengths and limitations of AI-generated dietary recommendations, emphasizing the need for human oversight.

One of the key findings is that ChatGPT has demonstrated strong performance in answering common dietary questions, often matching or exceeding dietitians in scientific accuracy, clarity, and practicality. However, its

effectiveness diminishes when applied to complex medical cases requiring individualized dietary planning (Kirk et al., 2023).

The accuracy of AI-generated dietary advice varies significantly depending on the complexity of the condition. Ponzo et al. (2024) reported that ChatGPT provided appropriate nutritional advice in 55.6–73.3% of cases related to non-communicable diseases (NCDs) such as hypertension and obesity. However, errors arose in more complex cases, such as recommending omega-3 fatty acids for liver disease without considering specific patient requirements. Similarly, Chatelan et al. (2023) identified risks of misinformation, as ChatGPT occasionally generated plausible but factually incorrect responses, reinforcing concerns regarding its reliability.

When evaluating AI-generated meal plans, studies indicate that ChatGPT excels in diversity but struggles with caloric accuracy. Papastratis et al. (2024) found that ChatGPT-created meal plans had a deviation of over 19% in caloric content compared to expert-developed systems, which exhibited only a 0.8% deviation. Although the AI demonstrated strong capabilities in meal variety (6.58 vs. 4.89 in meal diversity scores), its inconsistency in precise nutritional balance highlights the necessity for refinement.

The application of AI in educational contexts appears more promising. Liao et al. (2024) assessed ChatGPT's ability to enhance nutritional literacy and found that its responses scored highly in readability (84.38%), although practical guidance remained insufficient. This suggests that while ChatGPT can serve as an effective tool for general education, its use in clinical dietary planning requires further validation.

A particularly concerning limitation is the AI's inability to differentiate between appropriate and inappropriate food recommendations in specific medical cases. Studies have shown that ChatGPT sometimes includes problematic food choices in dietary plans, such as recommending almond milk for individuals with nut allergies (Niszczota & Rybicka, 2023). Similarly, Chatelan et al. (2023) found that ChatGPT-generated menus for patients undergoing hemodialysis overlapped with those designed for type 2 diabetes, failing to recognize the critical dietary differences between these conditions.

On the other hand, AI-driven meal planning systems that integrate real patient data show greater promise. Papastratis et al. (2024) developed an AI-based system that achieved 87% accuracy in tailoring meal plans to virtual profiles and 84.19% accuracy for real users. This suggests that when AI is combined with structured user data, it can produce more reliable and personalized dietary guidance.

Despite these advancements, ChatGPT's role in nutrition remains supplementary rather than leading. This technology is best suited for initial dietary guidance and educational purposes, while expert consultation remains essential for personalized nutritional planning. Kim et al. (2024) noted, AI-generated weight-loss plans were highly rated for safety (6.53/10), yet they still require clinical validation before being fully integrated into healthcare practice.

Overall, the evidence suggests that ChatGPT is a valuable tool for generating general dietary recommendations, but it cannot be a substitute for trained dietitians. Patients should remain aware of AI limitations, particularly their accuracy inconsistencies in complex cases. Future AI advancements should focus on improving contextual understanding, refining dietary recommendations for specific medical conditions, and ensuring compliance with expert guidelines to maximize its effectiveness in the healthcare sector.

Conclusion

Artificial intelligence, particularly ChatGPT, has transformed the accessibility of health-related information, making it easier for individuals to obtain guidance on general wellness, nutrition, and disease prevention. This technology has the potential to bridge gaps in healthcare access by offering immediate responses, enhancing public health education, and supporting decision-making for those seeking initial health insights. However, despite these benefits, AI-driven tools remain far from replacing human expertise in medical and nutritional fields.

One of the most pressing challenges of AI in healthcare is its inability to interpret real-time patient data, assess individual medical histories, or engage in nuanced decision-making. While AI can provide general guidance, it lacks the critical thinking, experience, and adaptability that human professionals bring to complex cases. The potential for misinformation, inaccuracies, and misinterpretation of user queries further limits its reliability, particularly in sensitive medical contexts.

Beyond accuracy concerns, ethical considerations such as data privacy and patient safety must be carefully managed. AI-generated recommendations should not be blindly trusted, especially when they involve medical conditions that require personalized treatment. Instead, these technologies should be viewed as supplementary tools that enhance, rather than replace, professional healthcare services.

The future of AI in healthcare will depend on improvements in its ability to provide accurate, personalized, and contextually aware recommendations. Collaboration between AI developers, healthcare professionals, and regulatory bodies will be essential to ensure that these tools are used safely and effectively. While AI will continue to play an important role in public health education, disease prevention, and nutritional guidance, human expertise will remain irreplaceable in delivering high-quality, personalized healthcare.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in EPHELS Journal belongs to the authors.

Conflict of Interest

* The authors declare that they have no conflicts of interest

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