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Chatgpt Versus Professional Nutritionists in Nutritional Assessment: A Comparative Qualitative Study

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Abstract:

The rapid expansion of artificial intelligence in healthcare has increased the use of conversational tools such as ChatGPT in nutrition counseling and dietary assessment. Although these systems provide immediate and accessible information, concerns remain regarding the reliability and personalization of their recommendations. This study aimed to compare nutritional recommendations generated by ChatGPT with those proposed by professional nutritionists using a qualitative case-based approach. Eight experienced nutritionists analyzed the same clinical case involving obesity, type 2 diabetes, hypertension, and unhealthy dietary behaviors. Their responses were compared with those generated by ChatGPT across twelve nutrition-related questions. The findings showed that ChatGPT produced coherent and scientifically acceptable answers in simple situations, particularly for general dietary education. However, professional nutritionists demonstrated greater precision, contextual understanding, and personalization in complex clinical scenarios. Their recommendations incorporated behavioral, psychosocial, and medical dimensions that were largely absent from AI-generated responses. These findings suggest that ChatGPT may serve as a complementary educational tool in nutrition but cannot replace the expertise and individualized care provided by healthcare professionals.

Keywords: artificial intelligence, ChatGPT, nutrition, dietitians, qualitative research, dietary counseling

Introduction

Artificial intelligence (AI) has progressively transformed the healthcare sector by improving access to information, supporting clinical decision-making, and facilitating patient monitoring. In recent years, conversational AI systems have become increasingly accessible to the public, allowing users to obtain medical and nutritional information in real time. Among these technologies, ChatGPT has emerged as one of the most widely used tools because of its capacity to generate detailed conversational responses in natural language.

In nutrition, AI-based systems are now integrated into mobile applications, dietary tracking platforms, and virtual counseling tools. These technologies can estimate caloric needs, recommend meal plans, provide nutritional education, and encourage healthier eating behaviors. Their accessibility and speed have contributed to their popularity among individuals seeking immediate dietary guidance without consulting healthcare professionals.

Despite these advantages, the growing use of AI in healthcare has raised important scientific and ethical concerns. Nutritional care is a complex and highly individualized process that depends on multiple factors, including medical history, metabolic status, lifestyle, psychological dimensions, social environment, cultural practices, and patient preferences. Unlike healthcare professionals, AI systems rely primarily on pre-existing textual data and predictive language generation rather than clinical reasoning or patient-centered judgment.

Several studies have demonstrated that AI tools may provide accurate information in simple or standardized situations. However, their performance tends to decline in more complex clinical contexts requiring personalization and multidimensional assessment. Inaccurate or generalized recommendations may potentially compromise patient safety, particularly among individuals with chronic diseases such as diabetes or cardiovascular disorders.

Professional nutritionists occupy a central role in nutritional management because they combine scientific knowledge with clinical expertise and interpersonal communication. Their approach extends beyond general dietary advice by integrating motivational support, behavioral counseling, follow-up, and individualized adaptation. This holistic perspective remains essential for sustainable dietary change and long-term disease management.

Although the literature increasingly explores AI applications in healthcare, direct comparisons between ChatGPT-generated nutritional advice and professional recommendations remain limited. Most existing studies focus either on technological performance or on general patient perceptions rather than detailed clinical comparison. Consequently, evaluating the strengths and limitations of AI systems in realistic nutritional scenarios is essential.

The present study therefore aimed to compare nutritional recommendations generated by ChatGPT with those proposed by professional nutritionists through the analysis of a clinical case involving obesity, hypertension, and poorly controlled type 2 diabetes. The objective was not only to assess the scientific accuracy of responses but also to examine personalization, contextual understanding, practical applicability, and clinical relevance.

Methods

This research adopted a qualitative comparative design intended to explore differences and similarities between AI-generated recommendations and professional nutritional expertise. A qualitative approach was considered appropriate because the study sought to evaluate the depth, contextualization, and practical meaning of recommendations rather than produce statistical generalizations.

Eight professional nutritionists with extensive clinical experience participated in the study. Participants were selected according to predefined criteria, including advanced academic qualifications in nutrition and significant experience in clinical practice. All participants were actively involved in nutritional counseling and chronic disease management at the time of the study.

A standardized clinical case was developed and presented to both the nutritionists and ChatGPT. The patient profile included overweight, type 2 diabetes, hypertension, sedentary behavior, and poor dietary habits. Twelve questions were formulated to evaluate different aspects of nutritional assessment and dietary intervention. The questions ranged from basic nutritional identification to more complex issues involving behavioral modification, glycemic management, meal planning, and practical implementation barriers.

The nutritionists independently provided written responses based on their clinical expertise. The same questions were submitted to ChatGPT using identical wording in order to ensure consistency. All responses were transcribed and organized for comparative analysis.

Thematic qualitative analysis was conducted manually. The responses were examined according to several analytical dimensions, including scientific accuracy, clinical reasoning, personalization, practical applicability, coherence, and contextual adaptation. Particular attention was paid to the ability of each approach to integrate the patient's medical condition, lifestyle, and psychosocial circumstances.

Ethical principles were respected throughout the study. Participants were informed about the objectives of the research and voluntarily agreed to participate. All data remained anonymous and confidential.

Results

The comparative analysis revealed substantial differences between ChatGPT and professional nutritionists regarding the depth, personalization, and contextual relevance of nutritional recommendations.

In the initial assessment of nutritional problems, professional nutritionists demonstrated a multidimensional understanding of the patient's condition. They identified obesity, poorly controlled diabetes, hypertension, sedentary lifestyle, irregular eating patterns, excessive intake of processed foods, and behavioral contributors to metabolic imbalance. More importantly, they explained the interactions between these conditions and emphasized the cumulative cardiovascular risks associated with them.

ChatGPT successfully identified major health concerns such as obesity and diabetes. However, the analysis remained relatively descriptive and lacked deeper exploration of the relationships between dietary habits, behavioral factors, and metabolic disorders. The responses generally focused on isolated issues rather than integrating them into a comprehensive clinical picture.

Important differences also emerged regarding nutritional objectives. Professional nutritionists proposed prioritized and progressive goals tailored to the patient's condition. They emphasized glycemic stabilization, gradual weight reduction, cardiovascular risk prevention, and sustainable dietary change. Several nutritionists specified realistic weight-loss targets and highlighted the importance of long-term adherence rather than rapid dietary restriction.

In contrast, ChatGPT proposed relevant but more generalized objectives, including weight loss and healthier eating habits. Although scientifically correct, the recommendations lacked prioritization and strategic planning. The AI-generated responses rarely explained why certain goals should be addressed before others or how objectives should evolve over time.

The divergence between the two approaches became particularly visible in dietary recommendations and meal planning. Professional nutritionists proposed detailed and individualized interventions adapted to the patient's metabolic profile and

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lifestyle. They recommended increasing fiber intake through vegetables, legumes, and whole grains while carefully controlling carbohydrate distribution throughout the day. Lean protein sources, healthy fats, and low-glycemic-index foods were systematically emphasized.

Furthermore, nutritionists incorporated practical and behavioral strategies into their recommendations. They advised meal planning, label reading, home cooking, portion control, gradual habit modification, and regular physical activity adapted to the patient's capacities. Several participants proposed alternative meal options according to cultural preferences and daily routines.

ChatGPT generated balanced dietary recommendations that generally aligned with standard nutritional guidelines. The system encouraged increased consumption of fruits, vegetables, and lean proteins while advising reduced intake of sugar, processed foods, and saturated fats. However, the recommendations remained largely generic and could potentially apply to any individual seeking healthier eating habits. The responses lacked detailed adaptation to the patient's clinical complexity.

One of the clearest differences concerned glycemic management. Nutritionists demonstrated strong clinical reasoning by recommending low-glycemic-index foods, carbohydrate distribution, meal regularity, and strategic combinations of carbohydrates with protein and fiber to reduce postprandial glucose fluctuations. Some participants also discussed blood glucose monitoring and individualized dietary adjustment according to treatment response.

ChatGPT proposed reducing sugar intake and maintaining balanced meals but did not elaborate extensively on advanced glycemic management strategies. The explanations remained simplified and lacked individualized therapeutic reasoning.

Similarly, in addressing hypertension, professional nutritionists proposed structured interventions inspired by evidence-based dietary models such as the DASH diet. They emphasized sodium reduction, potassium-rich foods, cardiovascular prevention, and overall metabolic improvement. Their recommendations reflected awareness of the patient's combined metabolic and cardiovascular risks.

ChatGPT advised reducing salt consumption and avoiding processed foods but did not provide detailed explanations regarding physiological mechanisms or structured nutritional approaches.

Behavioral and psychosocial dimensions represented another important area of divergence. Nutritionists consistently highlighted the importance of motivation, emotional factors, family environment, economic constraints, and social habits. They recognized that successful nutritional intervention depends not only on scientific recommendations but also on the patient's ability to implement changes within real-life circumstances.

Several nutritionists proposed gradual and realistic strategies to improve adherence, such as setting achievable goals, integrating physical activity into daily routines, and maintaining regular follow-up. This patient-centered approach reflected the human dimension of nutritional care.

Although ChatGPT acknowledged certain barriers such as lack of motivation or difficulty changing habits, the responses remained superficial and offered limited practical guidance for overcoming these challenges.

The analysis also demonstrated important differences in personalization. Nutritionists adapted recommendations according to patient preferences, lifestyle, and psychosocial context, whereas ChatGPT generated more standardized responses with limited contextual sensitivity.

Overall, the findings suggest that ChatGPT performs adequately in providing general educational information but remains limited in clinical personalization, multidimensional reasoning, and long-term behavioral support.

Discussion

The present study provides important insights into the role of conversational artificial intelligence in nutritional assessment and counseling. The findings demonstrate that ChatGPT can generate coherent, scientifically acceptable, and accessible responses for basic nutritional questions. This confirms the growing potential of AI systems as educational and informational tools in healthcare.

The capacity of ChatGPT to provide immediate dietary guidance may contribute positively to public health awareness, particularly in populations with limited access to healthcare professionals. By simplifying nutritional concepts and encouraging healthier habits, AI systems may support preventive health strategies and improve general nutritional literacy.

Nevertheless, the results also reveal significant limitations when AI-generated recommendations are compared with professional nutritional expertise. Professional nutritionists consistently demonstrated greater clinical depth, contextual understanding, and personalization. Their recommendations integrated medical, behavioral, psychological, and social dimensions that remain difficult for AI systems to reproduce.

One of the most important findings concerns clinical reasoning. Nutritionists approached the patient as a complex individual whose conditions, habits, emotions, and environment interact dynamically. Rather than simply identifying obesity or diabetes, they explored the underlying contributors and considered how multiple pathologies influence one another. This systemic perspective allowed them to propose coherent and realistic interventions.

ChatGPT, by contrast, generated responses based primarily on generalized nutritional knowledge. Although many recommendations were scientifically accurate, the system frequently lacked integration between the different dimensions of the clinical case. This limitation may reduce the relevance of AI-generated advice in complex healthcare situations.

The findings also emphasize the importance of personalization in nutritional management. Effective dietary counseling requires adaptation to cultural habits, food preferences, motivation, economic resources, and family environment. Professional nutritionists demonstrated substantial flexibility in adapting interventions according to these variables. Such personalization is essential for maintaining long-term adherence and achieving sustainable behavioral change.

Another key issue relates to behavioral support and therapeutic alliance. Nutritional intervention extends beyond providing information; it involves motivation, empathy, encouragement, and continuous follow-up. Professional nutritionists addressed emotional eating, stress management, realistic goal setting, and gradual progression. These interpersonal dimensions are fundamental components of patient-centered care and remain largely absent from AI-generated interactions.

The study therefore supports the view that AI should complement

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rather than replace healthcare professionals. ChatGPT may serve as a valuable educational resource, preliminary guidance tool, or support system for basic nutritional information. In certain contexts, particularly where healthcare access is limited, conversational AI may help individuals better understand dietary principles and encourage healthier choices.

However, relying exclusively on AI-generated recommendations could present risks, especially for patients with chronic diseases requiring individualized care. Simplified or insufficiently personalized advice may fail to address important clinical considerations and could potentially contribute to inappropriate dietary decisions.

These findings align with previous international studies indicating that AI performs relatively well in standardized tasks but encounters difficulties in complex clinical reasoning and contextual adaptation. Ethical concerns also emerge regarding responsibility, patient safety, and the risk of misinformation.

Future developments in AI technology may improve personalization capabilities through integration of patient data, wearable monitoring systems, and adaptive learning models. Nevertheless, even advanced technological systems are unlikely to fully replace the human expertise, empathy, and therapeutic relationship provided by healthcare professionals.

Conclusion

This study compared nutritional recommendations generated by ChatGPT with those proposed by professional nutritionists through a qualitative case-based analysis. The findings demonstrate that conversational AI can provide useful educational information and coherent general dietary advice. ChatGPT showed particular effectiveness in answering simple nutritional questions and explaining basic health concepts in an accessible manner.

However, substantial differences emerged in more complex clinical situations. Professional nutritionists consistently provided more comprehensive, personalized, and context-sensitive recommendations. Their ability to integrate medical conditions, psychosocial factors, behavioral challenges, and patient preferences resulted in more clinically relevant interventions.

The results confirm that artificial intelligence has important potential in nutrition education and public health promotion. Nevertheless, AI systems cannot currently replace the expertise, clinical reasoning, empathy, and individualized follow-up offered by healthcare professionals.

The integration of AI into nutritional care should therefore be approached as a complementary strategy rather than a substitute for professional practice. Future research involving larger populations and multiple clinical scenarios will be necessary to further evaluate the evolving role of artificial intelligence in healthcare nutrition.

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