



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research

Vol. 14, Issue, 04, pp. 65396-65400, April, 2024

<https://doi.org/10.37118/ijdr.28249.04.2024>



RESEARCH ARTICLE

OPEN ACCESS

ADVANCING PATIENT CARE: A CRITICAL REVIEW OF INTEGRATING MEDICAL NUTRITION INTO CLINICAL PRACTICE

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ARTICLE INFO

Article History:

Received 11th January, 2024

Received in revised form

16th February, 2024

Accepted 17th March, 2024

Published online 30th April, 2024

Key Words:

Medical nutrition, Clinical practice, Patient care, Dietary interventions, Interdisciplinary collaboration.

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ABSTRACT

The integration of medical nutrition into clinical practice is an evolving area that holds significant promise for improving patient outcomes across a spectrum of health conditions. This critical review explores the current state of integrating medical nutrition into clinical care, examining evidence-based practices, challenges, and opportunities for advancement. Key topics include the role of nutrition in disease prevention and management, the evidence supporting dietary interventions, strategies for implementing nutrition into clinical workflows, and the importance of interdisciplinary collaboration. Through a comprehensive analysis of existing literature and real-world case studies, this review aims to provide insights into optimizing patient care through the integration of medical nutrition into clinical practice.

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Citation: Mohammed Thabet Alqahtani, Saleh Mohammed Altofail, Essam Saad Alhoushani, Fahad Mohammed Alhusaini and Amal Mohammed Alqahtani, 2024. "Advancing patient care: a critical review of integrating medical nutrition into clinical practice". *International Journal of Development Research*, 14, (04), 65396-65400.

INTRODUCTION

In recent decades, there has been a paradigm shift in healthcare towards a more holistic approach that acknowledges the critical role of nutrition in promoting health and preventing disease. Mounting evidence from epidemiological studies, randomized controlled trials, and meta-analyses has underscored the profound impact of dietary habits on various health outcomes, from cardiovascular health to immune function. For instance, a landmark study by Hu *et al.* (2000) revealed that adherence to a Mediterranean diet, rich in fruits, vegetables, whole grains, and healthy fats, was associated with a significantly reduced risk of coronary heart disease. Similarly, the Dietary Approaches to Stop Hypertension (DASH) diet, characterized by its emphasis on fruits, vegetables, low-fat dairy, and lean protein, has been shown to lower blood pressure and improve lipid profiles (Appel *et al.*, 1997). Despite the growing recognition of the importance of nutrition in healthcare, the integration of medical nutrition into clinical practice remains a challenge. Healthcare providers often receive limited education and training in nutrition, leading to gaps in knowledge and confidence in addressing patients' dietary needs (Adams *et al.*, 2015). Time constraints during patient encounters further exacerbate this issue, with healthcare professionals often prioritizing acute medical issues over preventive care and lifestyle interventions (Jay *et al.*, 2016).

Moreover, reimbursement policies for nutrition services are often inadequate, discouraging healthcare organizations from investing in comprehensive nutrition programs (Schafer *et al.*, 2018). Nevertheless, the potential benefits of integrating medical nutrition into clinical practice are substantial. Evidence suggests that targeted dietary interventions can lead to significant improvements in patient outcomes, including reductions in morbidity and mortality (Mozaffarian *et al.*, 2016). By addressing nutrition within clinical settings, healthcare providers have the opportunity to not only treat existing diseases but also prevent future complications and promote overall wellness. In this critical review, we will explore the current landscape of integrating medical nutrition into clinical practice, examining evidence-based practices, challenges, and opportunities for advancement. Through a comprehensive analysis of existing literature and real-world case studies, we aim to provide insights into optimizing patient care through the integration of medical nutrition into clinical practice.

The Role of Nutrition in Disease Prevention and Management:

Nutrition is increasingly recognized as a cornerstone of health, playing a pivotal role in both the prevention and management of a wide array of diseases. Epidemiological studies, randomized controlled trials, and meta-analyses have provided compelling evidence of the profound impact of dietary habits on various health outcomes.

One of the most well-established links between nutrition and disease prevention is in the realm of cardiovascular health. The landmark Nurses' Health Study and Health Professionals Follow-Up Study, involving over 100,000 participants, demonstrated that adherence to a Mediterranean-style diet rich in fruits, vegetables, whole grains, nuts, and healthy fats was associated with a significantly reduced risk of coronary heart disease (Hu *et al.*, 2000). Similarly, the Dietary Approaches to Stop Hypertension (DASH) diet, which emphasizes fruits, vegetables, low-fat dairy, and lean protein, has been shown to lower blood pressure and improve lipid profiles, thereby reducing the risk of cardiovascular events (Appel *et al.*, 1997). Beyond cardiovascular health, nutrition also plays a critical role in the prevention and management of diabetes. Prospective cohort studies have consistently shown that dietary patterns characterized by higher intake of fruits, vegetables, whole grains, and nuts are associated with a lower risk of type 2 diabetes (Hu *et al.*, 2001). Conversely, diets high in processed foods, sugar-sweetened beverages, and red meat have been linked to an increased risk of diabetes and its complications.

Nutrition is also intricately linked to cancer risk. The World Cancer Research Fund and the American Institute for Cancer Research have identified several dietary factors that may influence cancer risk, including consumption of red and processed meats, alcohol intake, and intake of fruits and vegetables (World Cancer Research Fund/American Institute for Cancer Research, 2007). For example, high intake of red and processed meats has been associated with an increased risk of colorectal cancer, while diets rich in fruits and vegetables have been shown to have a protective effect against various types of cancer. In addition to its role in disease prevention, nutrition plays a crucial role in the management of existing health conditions. For individuals with diabetes, dietary interventions focused on carbohydrate quality and quantity, as well as glycemic control, are integral components of disease management (American Diabetes Association, 2020). Similarly, dietary modifications, such as reducing sodium intake and increasing potassium consumption, are recommended for individuals with hypertension to help lower blood pressure and reduce the risk of cardiovascular events (Whelton *et al.*, 2018). Overall, the evidence supporting the role of nutrition in disease prevention and management is robust and continues to grow. By promoting healthy dietary patterns and lifestyle behaviors, healthcare providers can empower patients to take control of their health and reduce their risk of chronic diseases.

Evidence-Based Practices in Medical Nutrition: In recent years, a wealth of research has contributed to the development of evidence-based practices in medical nutrition, guiding healthcare providers in delivering effective dietary interventions for disease prevention and management. Rigorous clinical trials, systematic reviews, and meta-analyses have shed light on the efficacy of various dietary patterns and nutritional strategies across a range of health conditions. One prominent example of evidence-based practice in medical nutrition is the Mediterranean diet. Numerous studies have demonstrated its effectiveness in reducing the risk of cardiovascular disease and improving cardiometabolic health outcomes. A meta-analysis of prospective cohort studies by Estruch *et al.* (2018) found that adherence to a Mediterranean diet was associated with a significant reduction in cardiovascular events, including myocardial infarction and stroke. Similarly, a randomized controlled trial known as the PREDIMED study provided robust evidence that a Mediterranean diet supplemented with extra-virgin olive oil or nuts reduced the incidence of major cardiovascular events in high-risk individuals (Estruch *et al.*, 2013). In the realm of diabetes management, evidence-based dietary interventions have focused on optimizing carbohydrate quality and quantity to improve glycemic control and reduce the risk of complications. The American Diabetes Association's Standards of Medical Care in Diabetes recommend individualized medical nutrition therapy as a core component of diabetes management, emphasizing the importance of carbohydrate counting, portion control, and dietary pattern optimization (American Diabetes Association, 2020).

Furthermore, evidence-based dietary patterns such as the Dietary Approaches to Stop Hypertension (DASH) diet have been shown to effectively lower blood pressure and improve lipid profiles, making them valuable tools for managing hypertension and reducing cardiovascular risk (Appel *et al.*, 1997). In addition to specific dietary patterns, evidence-based practices in medical nutrition also encompass nutritional supplementation and counseling. For example, omega-3 fatty acid supplementation has been investigated for its potential cardiovascular benefits, with meta-analyses suggesting a modest reduction in cardiovascular mortality and events (Aung *et al.*, 2018). Similarly, nutritional counseling provided by registered dietitians has been shown to improve dietary adherence and clinical outcomes in patients with chronic diseases such as diabetes and chronic kidney disease (Borgeraas *et al.*, 2013; Lew *et al.*, 2017). Overall, evidence-based practices in medical nutrition are grounded in rigorous scientific research and provide healthcare providers with actionable strategies for optimizing patient outcomes through dietary interventions.

Challenges in Integrating Medical Nutrition into Clinical Practice:

While the importance of nutrition in healthcare is widely recognized, several challenges hinder the seamless integration of medical nutrition into clinical practice. These challenges encompass various aspects of healthcare delivery, including education, time constraints, reimbursement policies, and interdisciplinary collaboration.

1. **Limited Nutrition Education Among Healthcare Providers:** One of the primary challenges is the lack of adequate nutrition education among healthcare providers. Many medical schools and residency programs offer limited coursework in nutrition, leaving healthcare professionals ill-equipped to address patients' dietary needs (Adams *et al.*, 2015). As a result, there is often a gap in knowledge and confidence when it comes to providing nutrition counseling and support.
2. **Time Constraints During Patient Encounters:** Healthcare providers face competing priorities and time constraints during patient encounters, making it challenging to address nutrition adequately. In busy clinical settings, preventive care and lifestyle interventions may take a backseat to acute medical issues (Jay *et al.*, 2016). Limited time for patient education and counseling can hinder the delivery of comprehensive nutrition care.
3. **Reimbursement Barriers for Nutrition Services:** Another significant barrier to integrating medical nutrition into clinical practice is the lack of adequate reimbursement for nutrition services. Healthcare organizations may face challenges in securing reimbursement for nutrition counseling and therapy, leading to underinvestment in nutrition programs (Schafer *et al.*, 2018). Without financial incentives, healthcare providers may be less motivated to prioritize nutrition interventions.
4. **Lack of Standardized Protocols:** The absence of standardized protocols for assessing and addressing nutrition-related issues presents a barrier to effective integration. Unlike other aspects of clinical care, such as medication management, there are often no standardized guidelines for nutrition assessment and intervention. This can result in inconsistencies in practice and variability in the quality of care provided to patients.
5. **Interdisciplinary Collaboration:** Effective integration of medical nutrition into clinical practice requires interdisciplinary collaboration among healthcare providers. However, silos between different specialties and disciplines can impede collaboration and communication. Physicians, dietitians, nurses, and other healthcare professionals may lack opportunities for meaningful collaboration, limiting the delivery of comprehensive care (Adams *et al.*, 2015).

Addressing these challenges will require a multifaceted approach that involves education, policy advocacy, and organizational changes within healthcare systems. By prioritizing nutrition education for healthcare providers, advocating for policy changes to improve reimbursement for nutrition services, and fostering interdisciplinary collaboration, healthcare organizations can overcome barriers and enhance the integration of medical nutrition into clinical practice.

Strategies for Implementing Nutrition into Clinical Workflows

Integrating nutrition into clinical workflows requires thoughtful planning and implementation to ensure seamless delivery of nutrition services within healthcare settings. Several strategies can facilitate the incorporation of nutrition into clinical practice, ranging from workflow modifications to leveraging technology and interdisciplinary collaboration.

1. **Incorporating Nutrition Assessments into Routine Clinical Encounters:** One strategy for integrating nutrition into clinical workflows is to incorporate routine nutrition assessments into primary care and specialty clinic visits. Screening tools such as the Malnutrition Universal Screening Tool (MUST) or the Mini Nutritional Assessment (MNA) can help identify patients at risk of malnutrition or nutrition-related complications (Stratton *et al.*, 2004; Kaiser *et al.*, 2009). By incorporating these assessments into routine clinical encounters, healthcare providers can identify nutrition-related issues early and initiate appropriate interventions.
2. **Providing Ongoing Education and Training for Healthcare Providers:** Education and training are essential components of successful nutrition integration efforts. Healthcare providers should receive ongoing education and training in nutrition assessment, counseling, and therapy to enhance their knowledge and skills in this area (Crowley *et al.*, 2017). Continuing medical education (CME) programs, workshops, and online resources can help healthcare providers stay updated on the latest evidence-based practices in medical nutrition.
3. **Leveraging Technology to Streamline Nutrition-Related Tasks:** Technology can play a key role in streamlining nutrition-related tasks and improving efficiency in clinical workflows. Electronic health record (EHR) systems can be configured to include nutrition assessment templates, documentation tools, and decision support alerts for healthcare providers (Crowley *et al.*, 2017). Telehealth platforms can also facilitate remote nutrition counseling and follow-up appointments, expanding access to nutrition services for patients in underserved areas.
4. **Establishing Referral Pathways to Registered Dietitians:** Interdisciplinary collaboration between physicians, nurses, and registered dietitians is essential for delivering comprehensive nutrition care. Establishing clear referral pathways to registered dietitians can ensure that patients receive timely and appropriate nutrition counseling and therapy (Crowley *et al.*, 2017). This may involve embedding dietitians within primary care practices, specialty clinics, or multidisciplinary care teams.
5. **Engaging Patients in Shared Decision-Making:** Engaging patients in shared decision-making is critical for successful nutrition integration efforts. Healthcare providers should involve patients in discussions about their dietary preferences, goals, and challenges, empowering them to take an active role in their nutrition care (Crowley *et al.*, 2017). Patient education materials, meal planning tools, and mobile health apps can support patient engagement and self-management.

By implementing these strategies, healthcare organizations can effectively integrate nutrition into clinical workflows and improve patient outcomes across a wide range of health conditions.

The Importance of Interdisciplinary Collaboration: Effective integration of medical nutrition into clinical practice relies on interdisciplinary collaboration among healthcare providers. Collaboration between physicians, registered dietitians, nurses, and other healthcare professionals is essential for delivering comprehensive care that addresses both medical and nutritional needs. Several studies highlight the importance of interdisciplinary collaboration in improving patient outcomes and enhancing the quality of nutrition care.

- ✓ **Improved Patient Outcomes:** Interdisciplinary collaboration has been associated with improved patient outcomes across various healthcare settings. A study by Haidet *et al.* (2008) found that

interdisciplinary teamwork in primary care was associated with better patient satisfaction, adherence to treatment plans, and clinical outcomes. By working together as a cohesive team, healthcare providers can address the complex interplay between medical conditions and nutritional status, leading to more effective management of chronic diseases and better overall health outcomes.

- ✓ **Comprehensive Care Delivery:** Collaboration between healthcare professionals with diverse expertise ensures that patients receive comprehensive care that addresses their medical, nutritional, and psychosocial needs. Registered dietitians play a central role in assessing patients' nutritional status, developing personalized nutrition plans, and providing ongoing support and counseling (Crowley *et al.*, 2017). By collaborating with physicians, nurses, and other members of the healthcare team, dietitians can ensure that nutrition interventions are integrated into the overall care plan and tailored to meet the individual needs of each patient.
- ✓ **Enhanced Communication and Coordination:** Interdisciplinary collaboration fosters open communication and coordination among healthcare providers, leading to more efficient and cohesive care delivery. By sharing information, insights, and expertise, healthcare professionals can work together to develop cohesive care plans that address all aspects of patient care (Schweiger *et al.*, 2016). Regular interdisciplinary team meetings, case conferences, and electronic health record systems facilitate communication and collaboration, ensuring that all members of the healthcare team are aligned in their approach to patient care.
- ✓ **Multidimensional Problem-Solving:** Collaboration between healthcare professionals with diverse backgrounds enables multidimensional problem-solving and innovation in patient care. By leveraging the unique perspectives and expertise of each team member, interdisciplinary teams can develop creative solutions to complex clinical challenges (Haidet *et al.*, 2008). This collaborative approach fosters a culture of continuous learning and improvement, driving innovation in nutrition care delivery.
- ✓ **Improved Healthcare Efficiency:** Interdisciplinary collaboration has the potential to improve healthcare efficiency by reducing duplication of efforts, streamlining care processes, and maximizing resources (Schweiger *et al.*, 2016). By working together collaboratively, healthcare providers can optimize workflow efficiencies, reduce administrative burdens, and enhance patient throughput without compromising the quality of care.

Overall, interdisciplinary collaboration is essential for integrating medical nutrition into clinical practice and optimizing patient outcomes. By fostering collaboration among healthcare professionals, healthcare organizations can ensure that patients receive comprehensive, coordinated care that addresses both their medical and nutritional needs.

Case Studies in Integrating Medical Nutrition into Clinical Practice: Real-world case studies offer valuable insights into the practical application of integrating medical nutrition into clinical practice. These examples demonstrate diverse approaches to incorporating nutrition into patient care and highlight successful initiatives that have enhanced patient outcomes.

Collaborative Care Model in Primary Care: In a primary care setting, a collaborative care model was implemented to integrate medical nutrition into routine patient care. This model involved embedding registered dietitians within primary care practices to provide nutrition assessments, counseling, and follow-up support to patients with chronic diseases such as diabetes, hypertension, and obesity. By working collaboratively with physicians, nurses, and other members of the healthcare team, dietitians were able to address patients' nutritional needs within the context of their overall medical care. This collaborative approach resulted in improved patient

outcomes, including better glycemic control, blood pressure management, and weight loss (Patnode *et al.*, 2017).

Specialized Nutrition Clinic in an Academic Medical Center: In an academic medical center, a specialized nutrition clinic was established to provide comprehensive nutrition services to patients with complex medical conditions. The clinic employed a multidisciplinary team of healthcare professionals, including physicians, dietitians, nurses, and social workers, who worked together to develop personalized nutrition care plans for each patient. Patients referred to the clinic received thorough nutrition assessments, dietary counseling, and ongoing support to help them achieve their nutritional goals. Through interdisciplinary collaboration and coordinated care delivery, the nutrition clinic was able to effectively address the diverse nutritional needs of patients with conditions such as cancer, gastrointestinal disorders, and eating disorders, leading to improved clinical outcomes and enhanced quality of life (Parekh *et al.*, 2019).

Community-Based Nutrition Education Program: In a community setting, a nutrition education program was developed to promote healthy eating habits and prevent nutrition-related diseases among underserved populations. The program offered group nutrition classes, cooking demonstrations, and individual counseling sessions led by registered dietitians and community health educators. Participants learned about the importance of balanced nutrition, meal planning, and healthy cooking techniques, and received practical tips for incorporating nutritious foods into their diets. Through this community-based approach, the nutrition education program successfully empowered participants to make positive changes in their dietary habits, leading to improvements in weight management, blood sugar control, and overall health outcomes (Gill *et al.*, 2018). These case studies demonstrate the diverse strategies and approaches to integrating medical nutrition into clinical practice, highlighting the importance of interdisciplinary collaboration, patient-centered care, and community engagement in delivering effective nutrition services.

CONCLUSION

In conclusion, the integration of medical nutrition into clinical practice is essential for promoting optimal health outcomes and preventing chronic diseases. Throughout this review, we have explored the importance of nutrition in disease prevention and management, evidence-based practices in medical nutrition, challenges in integration, strategies for implementation, the significance of interdisciplinary collaboration, and real-world case studies illustrating successful integration efforts. Evidence from epidemiological studies, randomized controlled trials, and meta-analyses highlights the profound impact of dietary habits on various health outcomes, including cardiovascular health, diabetes management, and cancer prevention. Evidence-based practices in medical nutrition, such as the Mediterranean diet and the DASH diet, provide actionable strategies for healthcare providers to optimize patient care through dietary interventions. Despite the growing recognition of the importance of nutrition in healthcare, several challenges hinder the seamless integration of medical nutrition into clinical practice, including limited nutrition education among healthcare providers, time constraints during patient encounters, and reimbursement barriers for nutrition services. However, strategies such as incorporating nutrition assessments into routine clinical encounters, providing ongoing education and training for healthcare providers, leveraging technology, establishing referral pathways to registered dietitians, and engaging patients in shared decision-making can facilitate the integration of medical nutrition into clinical workflows. Interdisciplinary collaboration among healthcare providers is essential for delivering comprehensive care that addresses both medical and nutritional needs. Real-world case studies have demonstrated the effectiveness of collaborative care models, specialized nutrition clinics, and community-based nutrition education programs in improving patient outcomes and enhancing the quality of nutrition care.

In conclusion, by overcoming challenges, implementing evidence-based practices, and fostering interdisciplinary collaboration, healthcare organizations can effectively integrate medical nutrition into clinical practice and optimize patient outcomes across a wide range of health conditions. Embracing a holistic approach that acknowledges the critical role of nutrition in healthcare is essential for promoting overall wellness and preventing chronic diseases.

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