Cogitare Enfermagem

REVIEW

Enteral nutritional therapy in older adults: a scientific overview based on bibliometric analysis*

HIGHLIGHTS

1. Scientific production on enteral nutritional therapy grew significantly after 2010.
2. Nutrition and Geriatrics lead research on enteral nutritional therapy in older adults.
3. Intensive Care Unit and cancer are driving themes in the literature.
4. Gaps persist in palliative care and frail older adults.

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ABSTRACT

Objective: to conduct a bibliometric analysis of scientific production on enteral nutritional therapy in older adults, highlighting thematic trends and research gaps. **Methodology:** The Web of Science database was used, with publications from 1988 to 2024. Quantitative indicators, number of publications, co-authorship networks, and keywords were analyzed. **Results:** a total of 506 documents were retrieved, published across 237 journals and authored by 2,291 individuals. Concentration was observed in the fields of Nutrition and Dietetics (43.48%) and Geriatrics (11.86%). A marked growth occurred after 2010, followed by stabilization. Intensive Care Unit, cancer, and malnutrition emerged as central themes. Gaps were identified in interventions targeting frail older adults and in palliative care. **Conclusions:** scientific production on enteral nutritional therapy in older adults has grown consistently, with emphasis on Nutrition and Geriatrics, but still lacks studies focused on personalized interventions and palliative care.

DESCRIPTORS: Elderly Nutrition; Nutrition Therapy; Enteral Nutrition; Bibliometrics.

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INTRODUCTION

Aging is a universal characteristic of life and a complex process at all levels, from biological to social[1], accompanied by considerable social challenges, as declining health status and disease can lead to disability and dependence, with malnutrition being one of these challenges[2].

Malnutrition is a central concern in the hospitalized older adult population, often exacerbated by the presence of chronic diseases and systemic inflammation, producing a significant negative impact on clinical outcomes and functional recovery after surgical or medical events[3]. Nutritional intervention aims to reverse this condition by providing adequate nutrients and maintaining energy balance[4].

Enteral nutritional therapy has been widely used as an essential intervention for maintaining the nutritional status of older adults, particularly those in fragile clinical or surgical conditions[5]. Adequate nutrition in debilitated patients during the postoperative period reduces complications such as infections and length of hospital stay[6]. From a metabolic standpoint, enteral nutritional therapy promotes the preservation of lean body mass, which is essential in the prevention and management of sarcopenia[7].

In addition to its clinical effectiveness, enteral nutritional therapy also contributes to reducing hospital costs, as it shortens length of stay and minimizes associated complications[8].

Given this context, the present study proposes a bibliometric analysis to investigate the evolution and current state of scientific production on enteral nutritional therapy in hospitalized older adults. By identifying key research topics and existing gaps, it aims to contribute to the development of new approaches and policies directed at geriatric nutritional care. Beyond fostering evidence-based practice, the findings of this study may provide relevant support for future investigations and interventions aimed at optimizing clinical and functional outcomes in this vulnerable population.

The objective of this study was to conduct a bibliometric analysis of scientific production on enteral nutritional therapy in older adults, highlighting thematic trends and research gaps.

METHOD

This was a bibliometric study, which emerges as a robust approach to analyze existing scientific production, identify knowledge gaps, and map emerging trends related to enteral nutritional therapy in older adults. Bibliometrics, by using quantitative indicators, enables the evaluation of volume, geographic distribution, the most influential journals, and leading authors who have contributed to the advancement of this field. The Preferred Reporting Items for Bibliometric Analysis framework was used as a reference instrument to assess the essential items for bibliometric studies[9].

Search strategy and study selection

A bibliometric analysis was carried out using the Web of Science database, focusing on publications related to enteral nutritional therapy in older adults. Studies published between 1988 and 2024 were initially retrieved. It was observed that the highest density

of scientific production on this topic occurred between 2010 and 2024; therefore, the inclusion criteria were defined as follows: only articles published between 2010 and 2024, limited to research and review articles specifically addressing enteral therapy in older adults, with a clinical, hospital, or home care focus. Other types of documents were excluded.[10-12] The following descriptors were used: Enteral Nutrition, Elderly, Older Adults, Aging, Nutritional Therapy, Nutritional Support, Geriatric Care, combined with Boolean operators. The search string applied was: *TS=((“Enteral Nutrition” AND (“Elderly” OR “Older Adults” OR “Aging”)) OR ((“Nutritional Therapy” OR “Nutritional Support”) AND (“Geriatric Care”)))*.

Data collection

Data were extracted by all researchers, working independently on separate computers, in January 2025, at a public university in Brazil, through the CAPES Journal Portal interface, using the Web of Science database. The information collected included article title, authors, year of publication, journal, impact factor, citations, and main findings. Additionally, the authors’ countries of affiliation and the most productive institutions were recorded, allowing for analysis of geographic distribution and international collaborations[10,13].

Bibliometric indicators

The main indicators assessed were the number of annual publications, most cited authors, journals with the greatest impact, co-authorship networks, and cumulative citations. Tools such as VOSviewer and Bibliometrix were employed for visualization of collaborative networks and keyword analysis. Temporal trend analysis allowed the identification of areas of scientific growth and emerging topics in the field[11,14].

Statistical analysis

Statistical analysis was performed using the Biblioshiny application, available in the Bibliometrix package integrated into R software. This application enabled interactive exploration of bibliometric data, generating descriptive graphs and correlation tables. Differences between variables, such as countries of publication or co-authorship networks, were analyzed quantitatively to identify research and collaboration trends. Additionally, cluster analysis was performed to identify prominent topics and their relationships with other areas of science[12-14].

Ethical aspects

This study did not directly involve human or animal subjects, being restricted to the analysis of publicly available secondary data. Therefore, ethical approval was not required. Nevertheless, the ethical principles of scientific research were rigorously followed, respecting copyright and ensuring appropriate citation of original works[10,13,15].

RESULTS

A total of 561 documents were retrieved from the Web of Science database, of which 506 were selected for analysis after applying the inclusion and exclusion criteria. Chart 1 details the main information obtained after matrix analysis using Bibliometrix, showing that the 506 articles selected from the Web of Science database were distributed across

237 journals, totaling 2,291 authors and co-authors. Furthermore, an annual growth rate of 9.91% and an average of 32.5 citations per document were observed.

Regarding the annual evolution of scientific production between 1988 and 2024, it was found that in the early years of the period analyzed (1988–1994), production was practically nonexistent, reflecting the initial interest in the subject. Between 1995 and 2009, gradual growth was observed, followed by significant acceleration. In 1995, 7 articles (1.38%) were published, while in 2002 the number rose to 15 articles (2.96%). The peak of this period occurred in 2009, with 21 articles published (4.15%).

Chart 1. Detailed information on data retrieval from Web of Science. João Pessoa, PB, Brazil, 2025

Description	Results
Sources (Journals)	237
Documents	506
Annual Growth Rate (%)	9.91
Mean Document Age	10.3
Mean Citations per Document	32.5
References	0
Document Content	
Keywords Plus (ID)	1309
Author Keywords (DE)	1027
Authors	
Authors	2291
Single-Author Documents	38
Authors Collaboration	
Sole-Authored Documents	41
Co-authors per Document	5.27
International Collaborations	12.25
Document Types	
Research Articles	410
Review Articles	96

Source: Authors (2025).

After 2009, production fluctuated, with a decline to 9 articles (1.78%) in 2010. However, the subsequent years (2017–2024) showed stabilization at higher levels of production. In 2021, 32 articles (6.32%) were published, while in 2022 the number increased to 38 articles (7.51%). Figure 1 illustrates the evolution of scientific production in absolute numbers after matrix analysis using Bibliometrix.

The results showed that of the 506 documents, Nutrition and Dietetics accounted for the largest share, with 220 publications, highlighting the centrality of this field in the study of enteral nutritional therapy in older adults.

Gerontology contributed 25 publications, reinforcing the focus on aging and its nutritional implications, similar to findings from other studies addressing multidimensional interventions for older adults[15]. Nursing and Pharmacology, with 20 publications each, reflect the active participation of various healthcare professionals in the field, consistent with bibliometric analyses emphasizing the interdisciplinary nature of health research[16].

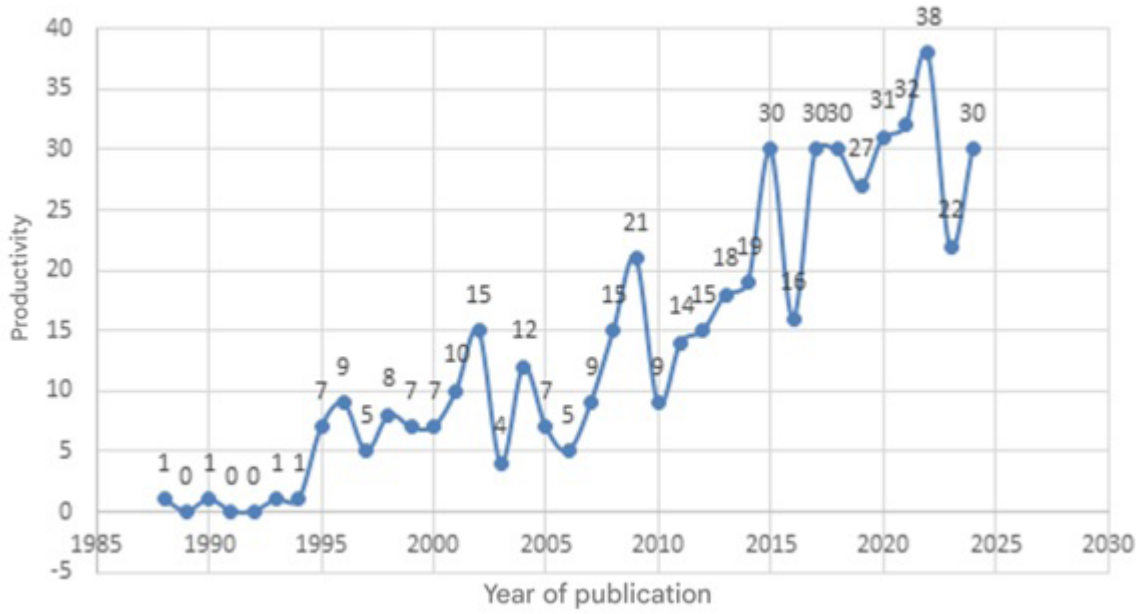

Figure 1. Evolution of scientific production, after matrix analysis using Bibliometrix. João Pessoa, PB, Brazil, 2025

Source: Authors (2025).

Conversely, fields such as Oncology and Health Sciences, each with 15 publications, showed lower but still relevant participation, aligned with studies addressing specific nutritional needs in complex clinical scenarios. Finally, areas such as Critical Care Medicine, Molecular Biochemistry, and Anesthesiology, with 13, 10, and 8 publications respectively, indicate less frequent but nonetheless significant connections with the main theme[17-23]. Chart 2 details the information by field of knowledge after matrix analysis using Bibliometrix.

Chart 2. Detailed information from Web of Science data retrieval by field of knowledge. João Pessoa, PB, Brazil, 2025

Field of Knowledge	Publications	Percentage (%)
Nutrition and Dietetics	220	43.47
Geriatrics and Gerontology	60	11.85
General Internal Medicine	40	7.90
Gastroenterology and Hepatology	30	5.92
Endocrinology and Metabolism	30	5.92
Gerontology	25	4.94
Nursing	20	3.95
Pharmacology and Pharmacy	20	3.95
Oncology	15	2.96
Critical Care Medicine	13	2.56
Health Sciences	15	2.96
Biochemistry and Molecular Biology	10	1.97
Anesthesiology	8	1.58

Source: Authors (2025).

The 12 journals with the highest number of publications were *Clinical Nutrition* with 42 articles, *Nutrición Hospitalaria* with 19 articles, followed by *Nutrients, Nutrition, and Nutrition in Clinical Practice* with 17 articles each. Next was the *Journal of Nutrition, Health & Aging* with 11 articles. Finally, *Geriatrics & Gerontology International* with 6 articles, and journals with 5 articles each: *American Journal of Clinical Nutrition*, *European Journal of Clinical Nutrition*, and *Journal of the American Medical Directors Association*.

For the analysis of trending topics, author keywords were considered. Bibliometrix was configured to include keywords with a minimum frequency of five, and at least three words per year. Figure 2 illustrates these keywords.

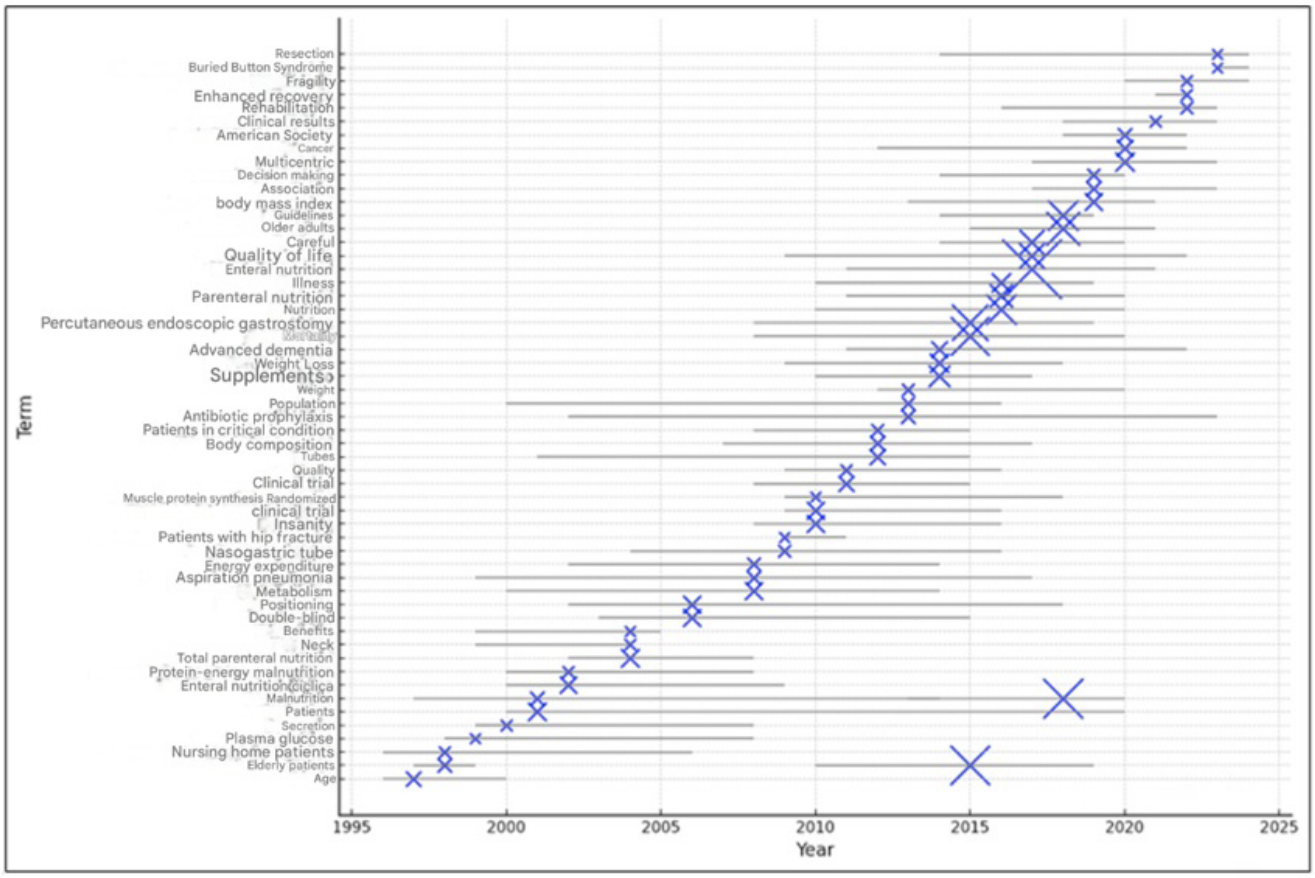

Figure 2. Trending topics based on author keywords. João Pessoa, PB, Brazil, 2025

Source: Authors (2025).

The thematic map (Figure 3) organizes trending topics based on author keywords, with cutoff years automatically defined by Bibliometrix. Topics are distributed into four quadrants according to their degree of relevance (centrality) and development (density):

Niche themes

Located in the upper left quadrant, include specialized topics with high density but low centrality, such as "enteral feeding" and "protein-energy malnutrition." These are often explored in specific contexts and may indicate areas less integrated into the core literature.

Motor themes

In the upper right quadrant, include topics such as "intensive care unit" and "cancer." These are highly developed and central to the field, demonstrating both theoretical and practical relevance.

Emerging or declining themes

In the lower left quadrant, cover topics with low centrality and density, such as "muscle mass" and "dehydration." These may represent areas with limited recent research volume or potential for future exploration.

Basic themes

In the lower right quadrant, include fundamental topics such as "enteral nutrition," "malnutrition," and "older adults." These have high centrality, being essential for knowledge building in the field, though with moderate levels of development.

Figure 3 illustrates the thematic evolution map for the period from 2019 to 2023. The number of cutoff periods was automatically defined by Bibliometrix to identify words contained in the authors' keywords. The map was constructed from the authors' keywords, totaling 250 terms, distributed based on a minimum cluster frequency of 3 words per 1,000 documents.

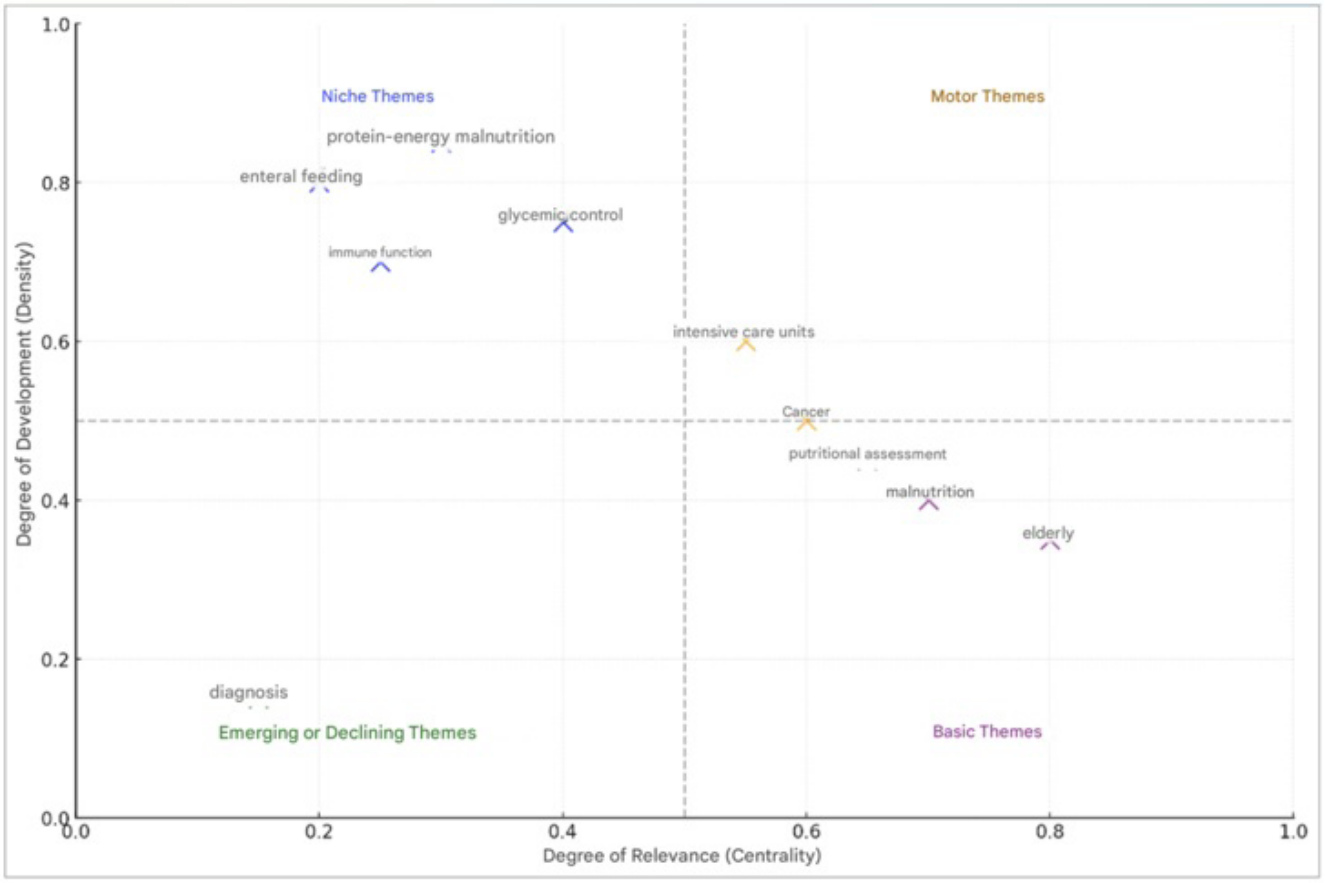

Figure 3. Thematic evolution of the subject between 2019 and 2023. João Pessoa, PB, Brazil, 2025

Source: Authors (2025).

DISCUSSION

The results presented corroborate previous studies that identified Clinical Nutrition (43.48% of publications) as a prominent area of investigation into health interventions for older adults[16]. The number of publications in Geriatrics and Gerontology (11.86%) reinforces the relevance of enteral nutritional therapy in the management of geriatric

conditions, consistent with findings from research that highlight nutrition as an integral component of geriatric care[17].

The significant number of publications in Gastroenterology and Hepatology (5.92%) aligns with studies emphasizing the relationship between digestive system diseases and the need for nutritional support in older populations[18], while publications in Endocrinology and Metabolism (5.92%) also reflect the interface between metabolic alterations and nutritional strategies, consistent with data associating malnutrition with the management of chronic metabolic diseases[19,20].

The scarcity of publications in the initial period between 1988 and 1994 is consistent with studies analyzing the evolution of emerging topics in the scientific literature, where growth tends to be slow until methods and thematic relevance are consolidated[24-26] .

The gradual increase observed from 1995, with a significant acceleration peaking in 2009, marks the beginning of the consolidation of the subject as relevant to the scientific community. This pattern of gradual growth followed by acceleration is consistent with what has been observed in other health-related research areas, as evidenced by studies highlighting the role of funding and public policies in promoting new lines of investigation[25-26].

From 2010 onward, oscillations in production may reflect shifts in research priorities or variations in funding[27]. However, more recent years (2021–2024) show stabilization at high levels of production, indicating that the subject has reached scientific maturity, consolidating itself as a field of ongoing research interest[28]. Stabilization at elevated levels reflects a solid knowledge base, supporting consistent and impactful investigations in the literature, as also reported in reviews on the consolidation of emerging fields in health research[29].

The map reflects the thematic diversity and hierarchical structure of research on enteral nutritional therapy in older adults, highlighting highly relevant areas as well as potential gaps for future investigation. Among the most relevant themes, there is a significant focus on the application of nutritional support in critical clinical conditions, such as liver failure and short bowel syndrome, which often require complex and individualized therapies. This thematic concentration is complemented by studies analyzing the effectiveness of different nutrient formulations and their impact on clinical outcomes, such as hospital mortality and metabolic complications[30]. This trend evidences the maturity of the field by prioritizing interventions that combine efficacy and safety in the management of older adults in highly complex contexts.

In addition, the marked increase in scientific production between 2010 and 2024 can be attributed to a confluence of structural, clinical, and demographic factors that significantly expanded the relevance of enteral nutritional therapy in older adult care[31-33]. During this period, specific clinical guidelines for nutritional care in the geriatric population were consolidated, supported by national and international scientific societies and health organizations. At the same time, technological advances such as improved feeding tubes, infusion pumps, and personalized enteral formulas made therapy safer, more effective, and more accessible, contributing to its broader implementation across different levels of healthcare[34-36].

Despite these advances, the map also highlights important gaps in the literature, particularly regarding the evaluation of nutritional interventions in frail older adults and those receiving palliative care[37-38]. The lack of studies focusing on these subgroups limits the development of specific guidelines to guide clinical practice more comprehensively and personally[39]. Moreover, there is an underrepresentation of investigations in low- and

middle-income settings, where resources for implementing enteral nutritional therapy are more limited[40]. Addressing these gaps through international collaborations and multicenter studies could strengthen the global applicability of the evidence generated, promoting a broader impact on the quality of life of older adults[41-42].

This study has the limitation of not conducting an in-depth analysis of the mapped documents, as it is a bibliometric review. However, it may serve as a basis for future research by enabling the identification of the main journals and authors with the greatest scientific relevance on the subject.

FINAL CONSIDERATIONS

The results of this bibliometric study highlight the growing scientific interest in enteral nutritional therapy in older adults, reflected in the increase in scientific production over recent decades and in the diversification of investigative approaches.

Despite the advances, the study reveals important gaps in the literature, such as the limited exploration of nutritional interventions in older adults receiving palliative care and in frail populations, as well as the underrepresentation of low- and middle-income contexts. These gaps underscore the need for more comprehensive and personalized clinical guidelines that incorporate both local specificities and global technical and scientific advances. Encouraging international collaboration may play a crucial role in overcoming these barriers, broadening the impact of the evidence generated.

Furthermore, the study contributes to consolidating the knowledge base on enteral nutritional therapy in hospitalized older adults, providing support for future investigations and for the development of public health policies aimed at geriatric care. Continued research on this subject, with a focus on individualized interventions and on expanding equity in access to nutritional resources, is essential to ensure quality of life and healthy longevity for this growing population.

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Olinto EOS, Feitosa GAM, Nepumoceno AMT, Costa e Silva SP, Moreira MASP.** Drafting the work or revising it critically for important intellectual content - **Olinto EOS, Feitosa GAM, Nepumoceno AMT, Costa e Silva SP, Moreira MASP.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Olinto EOS, Moreira MASP.** All authors approved the final version of the text.

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