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REVIEW ARTICLE

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Nutritional therapies in short bowel syndrome: a review

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Abstract

Introduction: Short Bowel Syndrome (SBS) is characterized by a state of malabsorption resulting from the anatomical or functional loss of the small intestine (SI). This condition can arise after surgical resection, the causes of which range from congenital defects to acquired diseases, often accompanied by various complications. Nutritional therapy (NT) plays a crucial role in the management of SBS, with the main objective of optimizing the absorption process, alleviating symptoms, and maintaining or recovering the patient's nutritional status. Initially, NT is implemented through parental nutrition (PN), but in the long term, the focus is on enabling individuals to meet their nutritional needs through enteral nutrition (EN) and oral feeding. In more severe cases, however, dependence on NP may be unavoidable. **Objective:** Incorporating data from a comprehensive literature review of national and international journals, this study aimed to provide a robust analysis to inform a narrative review of the effectiveness of PN. **Methods:** This review sought to consolidate best practices in the use of parenteral nutrition, supported by a solid base of scientific evidence, both from national and international literature. With this, we intend to offer a more in-depth and detailed understanding of its effectiveness, clinical benefits, challenges, and applications in different therapeutic contexts, providing support to optimize its implementation in the care of critically ill patients. **Results:** Based on the literature review, it was possible to evaluate the effectiveness of PN in the initial management of SBS, as well as transition strategies to enteral nutrition EN and long-term oral feeding, in addition to exploring the circumstances in which SBS Dependence on NP becomes inevitable, especially in more severe cases of the condition. NT plays a fundamental role in the management of SBS, being crucial to optimize nutrient absorption, alleviate symptoms, and preserve or restore the patient's

nutritional status. **Conclusion:** It can be seen that PN is essential at the beginning of treatment, ensuring nutritional replacement while the intestine cannot absorb it adequately. In the long term, the objective is to transition to EN and, when possible, oral feeding, in order to promote greater autonomy and quality of life for the patient. However, in severe or complicated cases, prolonged dependence on PN may be necessary, which requires ongoing monitoring and specialized management strategies.

Keywords: Nutritional therapy. Enteral nutrition. Parenteral nutrition. Short bowel syndrome.

Introduction

Short Bowel Syndrome (SBS) is characterized by a state of generalized malabsorption resulting from changes in the anatomy and physiology of the small intestine due to the significant loss of its functional structure. This clinical condition arises primarily after surgical resections of the small intestine and entails serious nutritional and metabolic consequences. SBS is considered the leading cause of intestinal failure and is strongly associated with high rates of morbidity and mortality. It is essential to emphasize that the severity of SBS is not solely determined by the length of the remaining small intestine, but primarily by the loss of its functional capacity to absorb essential nutrients **[1]**.

SBS is more common in women, with a ratio of 2:1 compared to men, possibly due to the smaller size of the small intestine compared to men. Because malabsorption is a central feature of the syndrome, its severity and extent determine the need for nutritional support, which is essential for adequate patient management. In this context, the therapeutic approach must always be multidisciplinary, encompassing nutritional and pharmacological care, and, when necessary, surgical interventions. Collaboration between professionals from different fields is essential to optimize treatment, minimize complications, and improve the quality of life of patients with SBS **[1,2]**.

The treatment of SBS is complex and challenging, requiring a personalized and carefully planned approach. The main goal of nutritional therapy (NT) is to maximize the digestive and absorptive capacity of the remaining intestine, promoting intestinal adaptation and functional recovery whenever possible. Studies show that adequate nutritional intervention is directly related to a significant improvement in survival rates, especially when effective long-term nutritional support can be provided. The ability to maintain sustainable and adequate nutritional support is a critical factor in the management of SBS, as it contributes to the recovery of the patient's nutritional status, reduces complications, and improves quality of life **[1]**.

Therefore, the primary goal of the nutritional approach in treatment is to improve the patient's nutritional status, generally beginning with parenteral nutrition (PN) strategies to meet nutritional needs in cases of severe malabsorption. As the patient's bowel function improves, therapy progresses to enteral nutrition (EN), stimulating the remaining intestine and promoting intestinal adaptation. Subsequently, oral feeding is gradually introduced, aiming to optimize nutritional intake and reduce dependence on artificial feeding methods. This progressive process aims not only to restore nutritional status but also to improve the patient's quality of life and promote functional recovery of the gastrointestinal tract **[3-5]**.

Thus, this study aimed to examine the available scientific evidence on parenteral nutrition with a focus on short bowel syndrome through a narrative review of the literature.

Methodology

This study was conducted through a narrative literature review, the main objective of which was to examine the available scientific evidence on parenteral nutrition, with a focus on Short Bowel Syndrome. To ensure transparency and systematicity, a structured approach was adopted, organizing the procedures chronologically.

The initial search was conducted in relevant databases, including PubMed, SciELO, and the Virtual Health Library (VHL). Strict inclusion and exclusion criteria were established for study selection. Only articles that were available in full, free of charge, and directly relevant to the topic addressed were included. Studies that did not meet these criteria were excluded from the review. The health descriptors (DeCs) used for the search were *parenteral nutrition, with an emphasis on therapeutic strategies aimed at Short Bowel Syndrome*. These terms were combined using Boolean operators (AND, OR) to optimize the retrieval of relevant data. Additionally, the references of the selected articles were analyzed to identify additional studies that could enrich the review.

The studies were initially evaluated based on their titles and abstracts, and a full-text analysis was performed only for those that met the eligibility criteria. The objective of this study is to synthesize the existing evidence and provide a comprehensive overview of the advances and challenges in the nutritional management of this condition. Each study was evaluated for its methodology, results, and quality

of evidence, considering aspects of internal and external validity. The qualitative analysis of the results was conducted descriptively, highlighting the main divergences and convergences between the studies, as well as any identified knowledge gaps.

The procedures described ensure that the data analyzed and discussed in this work were extracted from reliable and highly scientifically relevant sources, demonstrating the validity of the conclusions regarding the metabolic effects of hormone therapy in the treatment of obesity and metabolic syndrome in menopausal women. In addition to the articles found, books, issues, and manuals on the topic were used as the focus of this narrative review.

Results and Discussion

SBS occurs when the remaining bowel is insufficient to maintain normal absorptive functions. Causes of SBS include inflammatory bowel disease, vascular events, abdominal trauma, and congenital conditions such as necrotizing enterocolitis. The severity of the condition depends on factors such as the intestinal segment lost, the extent of the resection, and the presence of the ileocecal valve, which plays an important role in nutrient absorption **[2]**.

The metabolic changes observed in patients with SBS are directly related to the extent of the resected area, the amount of remaining bowel, and the presence or severity of disease in the preserved intestinal segment. Proximal resections can cause significant deficits in the synthesis of essential gastrointestinal hormones such as gastrin, cholecystokinin (CCK), and secretin. These hormones play key roles in digestion and nutrient absorption **[2]**.

Furthermore, proximal resections often compromise the absorption of lipids and fat-soluble vitamins, especially vitamin D, a deficiency of which is associated with reduced calcium absorption, contributing to hypocalcemia and an increased risk of bone diseases such as osteopenia and osteoporosis **[3]**. These metabolic imbalances highlight the need for close monitoring and targeted supplementation to minimize complications in patients with SBS.

Also, SBS is a leading cause of chronic intestinal failure (CIF), characterized by structural and functional alterations in the intestine that result in malabsorption and an increased risk of micronutrient deficiencies. Although CIF can be reversible depending on the anatomy and adaptability of the intestine, most patients with severe SBS require long-term nutritional support, often in the form of PN **[3]**.

Management of SBS typically begins with dietary modifications and pharmacological therapies, which should be tailored to the patient's anatomy and physiology. However, these interventions are rarely sufficient to avoid the need for PN. In some cases, hormonal therapies focused on intestinal adaptation have shown promising results. For more severe cases, surgical options, including intestinal transplantation, are available, but they have significant limitations, such as donor scarcity and the risks associated with the procedure **[4]**.

Given the risk of complications and the need for adequate nutrition, home parenteral nutrition has become the mainstay of treatment for severe SBS. This treatment involves the chronic administration of macronutrients, micronutrients, fluids, and electrolytes through a central venous line, allowing the patient to receive nutritional support at home, which contributes to improved quality of life and reduced frequent hospitalizations **[4]**.

Nutritional Therapy

The main goal of NT in the management of SBS is to maximize the digestive and absorptive capacity of the remaining intestine. This process aims to promote intestinal adaptation, which involves structural and functional changes in the remaining intestine, such as increased absorptive capacity. Nutrition plays a crucial role in the management of SBS. Because nutrient absorption is compromised, nutritional therapy aims to correct nutritional deficiencies and maximize nutrient absorption **[1]**.

Nutritional therapy in SBS aims to address the metabolic and nutritional challenges arising from the condition, promoting clinical stability and quality of life **[1]**. SBS often results in malabsorption, leading to weight loss and malnutrition. NT should meet energy and protein needs through personalized nutritional plans, which may include oral feeding, enteral nutrition, and, in severe cases, parenteral nutrition. Regular monitoring of weight and biochemical parameters is essential to adjust the intervention **[5,6]**.

Intestinal adaptation is a natural process that occurs after intestinal resection, with an increase in the functional capacity of the remaining intestine. PN plays a crucial role in this process, stimulating the intestine through enteral feeding and progressively more complete diets. The use of soluble fiber and trophic nutrients, such as glutamine, can also be beneficial in stimulating villi growth and nutrient absorption **[7]**.

Although PN is often necessary in the early stages of severe cases of SBS, its prolonged use is associated with complications such as catheter-related infections and hepatic cholestasis. Therefore, transitioning to enteral or oral nutrition is prioritized as soon as safe,

maximizing intestinal function and reducing associated risks [7].

Bowel resection can lead to significant losses of micronutrients, such as iron, zinc, magnesium, fat-soluble vitamins (A, D, E, and K), and vitamin B12, especially in cases of ileal resection. Furthermore, fluid imbalance is common due to impaired intestinal absorption. Oral or intravenous nutritional supplementation is indicated, and adequate fluid intake should be carefully monitored to avoid dehydration and electrolyte disturbances [7].

Approaches in Nutritional Therapy: Types and Indications

The indication for EN should be carefully considered based on several interrelated clinical factors. Assessment of gastrointestinal (GI) tract function is essential, as EN is primarily indicated when the patient's digestive system is functional but oral food intake (OI) is insufficient to meet nutritional needs [8].

Furthermore, the degree of malnutrition exacerbated catabolism, and the percentage of weight loss play crucial roles in the decision, as these indicate the severity of the nutritional condition and the need for early intervention. The presence of dysphagia (difficulty swallowing) is also a relevant factor, as it can compromise adequate oral intake and justify the implementation of EN to ensure the necessary nutritional intake. These parameters should be comprehensively assessed, considering the patient's clinical characteristics, to determine the need for EN and the most appropriate type of nutritional support [8].

Parenteral Nutrition

PN involves the intravenous infusion of nutrient formulations that are accurately calculated and balanced to meet the essential nutrient needs of patients who cannot tolerate oral or enteral feeding, such as patients with a fully or partially compromised gastrointestinal tract, preoperative patients, severely malnourished patients, premature newborns, etc. PN can be classified as total parenteral nutrition (TPN) and partial parenteral nutrition. TPN occurs when all of the patient's nutritional needs are met exclusively through PN. Partial parenteral nutrition, on the other hand, provides only a fraction of a patient's daily nutritional requirements [9].

PN is an essential therapeutic modality for patients who are completely or partially unable to utilize the gastrointestinal tract for nutrient intake. It is a vital intervention for patients who cannot receive adequate or acceptable oral or EN. It consists of administering macronutrients, micronutrients, electrolytes, and water directly into the bloodstream through peripheral or central venous access, ensuring the nutritional support necessary to maintain nutritional status and metabolic homeostasis [9].

Over the years, PN has become an essential component of adjunctive therapy for various clinical conditions, being used both in hospitalized patients and in those receiving treatment at home. PN formulations can be classified as standard or adaptable, depending on the specific needs of each patient. These formulations are complex compositions that include macronutrients, such as amino acids, dextrose, and fat emulsions, as well as micronutrients, including electrolytes, vitamins, and trace elements. This personalized approach is essential to ensure treatment efficacy and the recovery of patients' nutritional status [10].

PN is often the primary modality of nutritional support in patients with SBS during the acute phase or in situations where bowel function is severely limited. Its composition includes macronutrients, such as amino acids, lipids, and glucose, and micronutrients, such as vitamins and minerals, adjusted according to the patient's individual needs [10]. Studies indicate that early use of PN is essential to prevent malnutrition and protein catabolism. However, prolonged dependence on PN can be associated with complications, such as liver dysfunction and catheter-related sepsis. Therefore, it is essential to closely monitor patients' biochemical and metabolic parameters [11].

PN, while essential, is an expensive therapy and can be associated with complications. Metabolic complications include macro- and micronutrient disorders, such as hyperglycemia, hypertriglyceridemia, and electrolyte imbalances, which can arise at any stage of therapy. Infectious complications, particularly those related to intravenous access, are common [11].

In Brazil, with the significant increase in PN use and aiming to ensure adequate nutrition for patients, the Ministry of Health, through the Health Surveillance Agency (SVS/MS), regulated this practice with Ordinance No. 272/98. This regulation establishes the creation of the Multidisciplinary Nutrition Therapy Team (EMTN), in addition to defining Good Parenteral Nutrition Preparation Practices (BPPNP) and Good Parenteral Nutrition Administration Practices (BPANP). Thus, the ordinance regulates all stages of this process, from medical indication and prescription to preparation, administration, clinical and laboratory monitoring, culminating in the final evaluation of the therapy [12].

In 1975, the Brazilian Society of Parenteral and Enteral Nutrition (SBNPEBRASPEN) was created to

ensure that parenteral NT was administered by current regulations, ensuring that it was safe, efficient, and of high quality. Thus, the society strives to provide patients with the best possible treatment through NT **[13]**.

Enteral Nutrition

EN is an essential therapeutic strategy for patients with impaired oral intake but a functional GI tract. It involves a carefully designed nutritional plan aimed at providing macro- and micronutrients appropriate to each patient's clinical needs, aiming to prevent or treat malnutrition and optimize clinical outcomes **[14]**.

Early introduction of enteral nutrition is encouraged to stimulate intestinal adaptation. The choice of enteral formula should consider the patient's absorptive capacity, with elemental or semi-elemental formulas being preferred in cases of severe impairment. EN can be defined as nutritional planning aimed at providing macro- and micronutrients to patients according to their clinical condition. EN typically involves delivering food in liquid form directly into the GI tract through a nasogastric or orogastric feeding tube, or a gastric or intestinal tube surgically placed in the patient **[15]**.

EN involves delivering nutrients in liquid form directly into the GI tract through devices such as nasogastric or nasoenteric tubes, gastrostomies, or jejunostomies. The main objective is to ensure adequate nutritional intake in patients unable to ingest food orally, whether due to dysphagia, neurological diseases, head and neck cancers, or postoperatively. The choice of device and EN administration technique depends on the clinical condition and the estimated duration of use. Nasogastric or nasoenteral tubes are indicated for short-term use, lasting less than 4-6 weeks, and/or gastrostomy or jejunostomy tubes are used in patients requiring longterm support, inserted surgically, endoscopically, or radiologically **[15]**.

Nutrients can be administered intermittently or continuously, based on the patient's tolerance and metabolic needs. EN offers several advantages over parenteral nutrition, including preserving intestinal function, promoting mucosal barrier integrity, reducing infectious complications by avoiding prolonged use of intravenous lines, improving nutritional status, and preventing loss of muscle mass and functionality. To ensure the efficacy and safety of EN, continuous monitoring of clinical and laboratory parameters is essential. The main associated complications include mechanical complications, such as tube obstruction or dislodgement; digestive intolerance, including diarrhea, vomiting, and abdominal distension; and metabolic disorders, such as hyperglycemia and electrolyte imbalances. EN is a vital intervention in the care of patients with impaired oral feeding, allowing for the maintenance of nutritional status and prevention of complications associated with malnutrition. Its implementation requires the involvement of a qualified multidisciplinary team, ensuring that the therapy is safe, effective, and tailored to the specific needs of each patient **[16-18]**.

Oral Diet

Nutritional therapy plays a crucial role in reducing malabsorption symptoms and maintaining nutritional status. To achieve this, it is essential that the patient maintains discipline and is regularly monitored by a healthcare team. Periodic vitamin and mineral supplementation is necessary to correct deficiencies resulting from malabsorption, ensuring micronutrient balance **[19,20]**.

Nutritional guidance should consider the anatomy of the remaining intestine. In patients without a colon, lipid or oxalate restriction generally offers no benefits. However, in the presence of partial or complete colon damage, a diet rich in carbohydrates and low in fat is recommended to optimize absorption and reduce nutritional losses **[20]**. Additionally, specific eating habits are essential, and fractional eating is recommended, with food consumed in small portions, chewed slowly, and separated between liquids and solids during meals to promote digestion and absorption **[21]**.

This personalized approach improves patients' nutritional status and quality of life, highlighting the importance of ongoing monitoring and dietary adjustments. In stabilization phases, personalized diets can be implemented; a diet rich in complex carbohydrates and low in fat is recommended, except in cases of pancreatic insufficiency, where medium-chain fats may be more appropriate. Soluble fiber supplementation can improve stool consistency and increase intestinal transit time **[21]**.

Intestinal Adaptation

Intestinal adaptation is a fundamental process in patients with SBS, occurring predominantly in the first 1 to 2 years after intestinal resection. This mechanism involves structural and functional changes in the remaining intestine, including hypertrophy of intestinal villi, increased crypt depth, and longer intestinal transit time, which improves absorptive capacity **[22]**.

Enteral nutrition is one of the main factors, as it promotes direct contact of nutrients with the intestinal mucosa, stimulating its trophic activity. Furthermore, hormones such as glucagon-like peptide-2 (GLP-2) have shown significant efficacy in promoting mucosal

regeneration, reducing intestinal motility, and improving nutrient absorption. This integrated approach aims to maximize the potential for adaptation, reducing dependence on long-term parenteral nutritional support, and improving patients' quality of life [23].

Nutritional Supplementation

Patients with SBS often develop micronutrient deficiencies due to malabsorption resulting from reduced functional intestinal surface area. Among the most commonly affected micronutrients are fat-soluble vitamins (A, D, E, and K), calcium, magnesium, zinc, and iron, which are essential for various metabolic and physiological functions [24].

Correction of these deficiencies requires individualized supplementation, which can be administered orally or intravenously, depending on the degree of residual absorption and the patient's needs. For example, intravenous supplementation is generally indicated for patients with significant loss of small intestine or colon function, where mineral and vitamin absorption is severely compromised [25].

Regular laboratory monitoring is essential to assess serum levels of these micronutrients and adjust supplementation doses as needed. Periodic testing should include serum levels of ionized calcium, phosphorus, magnesium, and iron, as well as fat- and water-soluble vitamins. This monitoring is essential to avoid both persistent deficiencies and toxicity from excessive supplementation [26]. In addition to nutritional supplementation, medications that reduce intestinal motility, such as loperamide and opioids, or that promote intestinal adaptation, such as teduglutide, a GLP-2 analog, may be considered [27,28].

Conclusion

This narrative review highlights that PN plays a crucial role in the initial treatment of patients with conditions that compromise intestinal function, such as Short Bowel Syndrome, ensuring the necessary nutritional replacement when the intestine cannot achieve adequate absorption. In the long term, the therapeutic goal is the transition to EN and, when possible, to oral feeding, aiming for functional recovery of the gastrointestinal tract and the promotion of greater autonomy and quality of life for the patient. However, in more severe or complicated cases, prolonged dependence on PN may be inevitable, which requires continuous monitoring and specialized nutritional management strategies to minimize associated risks and ensure the patient's health. Therefore, the therapeutic approach must always be individualized and based on each patient's specific needs, with ongoing multidisciplinary monitoring to optimize long-term results. A multidisciplinary approach is essential for the management of SBS, involving gastroenterologists, nutritionists, surgeons, and other healthcare professionals. The goal is to promote nutritional autonomy and improve patients' quality of life.

CRediT

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References

1. Rocha EEM, Correia MITD, Borges VC, Dias MCG, Rocha RO, Borges A, Campos ACL, Buzzini R. Nutritional Therapy in Short Bowel Syndrome - Intestinal Failure/Failure. Authorship: Brazilian Society of Parenteral and Enteral Nutrition, Brazilian Association of Nutrology. 2011.
2. Solar H, Ortega ML, Gondolesi G. Current status of chronic intestinal failure management in adults. Nutrients, Aug. 10, 2024, v. 16, n. 16, p. 2648. DOI: 10.3390/nu16162648.
3. Gu P, Pu B, Chen B, Zheng XH, Zeng ZP, Luo W. Effects of vitamin D deficiency on blood lipids and bone metabolism: a large cross-sectional study. Journal of Orthopaedic Surgery and Research, 2023, v. 18, art. 20.
4. Iyer K, Dibaise JK, Rubio-Tapia A. Aga Clinical Practice Update on Management of Short Bowel Syndrome: Expert Review. Journal of Orthopaedic Surgery and Research, 2022.
5. O'Keefe SJ, Buchman AL, Fishbein TM, et al. Short bowel syndrome and intestinal failure: consensus definitions and overview. Clin Gastroenterol Hepatol. 2006;4(1):6-10.
6. Pironi L, Arends J, Baxter J, et al. ESPEN guidelines on chronic intestinal failure in adults. Clin Nutr. 2016;35(2):247-307.
7. Jeppesen PB. Spectrum of short bowel syndrome in adults: intestinal insufficiency to intestinal failure. JPEN J Parenter Enteral Nutr. 2014;38(1 Suppl):8S-13S.
8. Mcclave SA. et al. Summary points and consensus recommendations from the North American Surgical Nutrition Summit. Journal of Parenteral and Enteral Nutrition, [S.l.], 2013, v. 37, n. 5, Suppl., p. 99S-105S.
9. Heyland DK, Montalvo M, MacDonald S, Keefe L, Su XY, Drover JW. Total parenteral nutrition in the surgical patient: a meta-analysis. Can J Surg. 2001;44(2):102.
10. Mohiuddin AK. Pharmacists in Critical Care. INNOVATIONS in pharmacy, 2019, v. 10, n. 1, p. 1-15.
11. Mascarenhas MBJ, Barros RS, Martins BCC, Loureiro CV, Araújo TDV, Ponciano AMS, Fonteles MMF. Neonatal parenteral nutrition solutions in a Brazilian teaching hospital: from indication to administration. Brazilian Journal of Hospital Pharmacy and Health Services, São Paulo. 2015, v.6. n.2. p. 18-23.
12. Brazil, Ministry of Health. Health Surveillance Secretariat – ANVISA. Technical regulation for Parenteral Nutrition Therapy. Ordinance No. 272, of April 8, 1998. Brasília, Official Gazette of the Union - D.O.U. 1998. Available at: https://www.saude.mg.gov.br/index.php?option=com_gmg&controller=docume nt&id=879. Accessed on: November 25, 2024.
13. Campos LF, Ceniccola GD, Toledo DO, Horie LM, Piovacari SMF, Serpa Neto A, Barreto PA, Gouvea MC. Who Nourishes? A survey of EMTNs in Brazil. Braspen Journal, [S.L.], 2020, v. 35, n. 3, p. 204-209.
14. ASPEN Board of Directors. Guidelines for the provision and assessment of nutrition support therapy. JPEN J Parenter Enteral Nutr. 2017;41(1):1-37.
15. Souza MT, Silva FC, Santos RT. Enteral nutrition and its clinical implications. Brazilian Journal of Intensive Care. 2020;32(2):145-154.
16. ESPEN Guidelines. Clinical nutrition in critical care. Clin Nutr. 2019;38(1):48-79.
17. BRASPEN. Nutritional Therapy: Practical Manual. São Paulo: BRASPEN, 2021.
18. Fonseca DS, et al. Complications associated with enteral nutrition in hospitalized patients. Brazilian Journal of Clinical Nutrition. 2022;37(4):123-130.
19. Thompson JS, et al. Current management of

short bowel syndrome. Curr Probl Surg, 2012, n.49, p. 52-115.

20. Sundaram A, Koutkia P, Apovian CM. Nutritional Management of Short Bowel Syndromein Adults. J Clin Gastroenterol, Boston, 2002, v. 34, n. 3, p. 207220.
21. Wall EA. An Overview of Short Bowel Syndrome Management: Adherence, Adaptation, and Practical Recommendations. Journal of the Academy of Nutrition and Dietetics, Chicago, 2013, v. 113, n. 9, p. 1200-1208.
22. Jeppesen PB. The role of GLP-2 in the management of short bowel syndrome. Current Opinion in Gastroenterology, 2012.
23. Taconi C, et al. GLP-2 and its analogues: role in intestinal adaptation. Nutritional Reviews, 2016.
24. Jeppesen PB. The impact of GLP-2 on intestinal adaptation and the treatment of short bowel syndrome. Journal of Parenteral and Enteral Nutrition., 2012.
25. Pironi L, et al. Clinical classification of intestinal failure and its implications for management. Lancet Gastroenterology & Hepatology, 2018.
26. Goulet O, et al. Short bowel syndrome and intestinal failure in children and adults. Orphanet Journal of Rare Diseases, 2020.
27. ANVISA. Food: Dietary Supplements. Available at https://bit.ly/2E3s5kR. Accessed on November 20, 2024.
28. Brazil. Ministry of Health. Secretariat of Health Care. Department of Specialized and Thematic Care. Manual of Nutritional Therapy in Specialized Hospital Care within the Unified Health System – SUS. Brasília, DF: Ministry of Health, 2016.