Nutritional interventions for older adults in palliative care: a scoping review

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Abstract

Objective: To analyze the nutritional interventions adopted in older people in palliative care found in the literature. *Method:* A scoping review was conducted involving a search of the following databases: PubMed, LILACS, CINAHL, Scopus, Web of Science, EMBASE and of the gray literature through Google Scholar, OpenGrey and ProQuests & Theses Global, without restrictions on publication date or language. The searches were performed using the descriptors and keywords, combined using Boolean operators AND and OR: "Nutritional Intervention", "*Intervenção Nutricional*", "Palliative Care", "*Cuidados Paliativos*", "Aged" and "*Idosos*". *Results:* Of the 5,942 studies found, 13 studies were selected. The backward citation search strategy identified 13 additional studies, giving a final total of 26 studies. Nutritional interventions adopted in older people in palliative care predominantly comprised nutritional counseling, oral nutritional supplementation and artificial nutrition through enteral and parenteral nutrition. These interventions focused on quality of life, symptom management and nutritional status. *Conclusion:* Although there are gaps in the literature regarding nutritional interventions for older adults in palliative care, the importance of the role of nutritionists in promoting quality of life and relieving suffering of this population is clear.

Keywords: Palliative Care. Nutrition Therapy. Aged. Nutritionists.

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INTRODUCTION

The natural course of human aging is accompanied by a greater susceptibility for developing diseases such as cancer, neurologic disorders and chronic musculoskeletal conditions, among others[1]. These diseases can result in progressive impairment that can lead to functional dependence which, together with declining health status, may require palliative care[2].

Palliative care can be defined as holistic care provided actively to individuals of any age who are suffering from serious diseases, especially those with a terminal illness, aimed at improving quality of life of the patient, family members and caregivers[2].

In this context, a multidisciplinary team is needed for the delivery of palliative care to the older patient, delivering care which takes the individual as a whole into account, assessing all dimensions and devising an effective approach that encompasses all aspects evaluated. Among the different professionals involved in the team, the nutritionist must seek the best strategies for management of patient nutrition, ensuring adequate food intake based on physical, psychological and religious dimensions, all of which influence improvement in the quality of life of patients[4].

The role of the nutritionist entails interventions which can both help maintain or restore nutritional status, as well as promote well-being during the different stages of disease. The goals of nutritional support, as end-of-life approaches, should center more on improving quality of life than achieving adequate nutrition. Thus, nutritional interventions should be reconciled with the aim of palliative care in providing comfort and helping control symptoms[5,6].

Concerns over defining adequate procedures and strategies to cater for the nutritional needs of older patients in palliative care remains a source of discussion among nutritionists, given that many professionals are ill-prepared to deal with situations in practice that stray outside conventional text-book situations[6] , highlighting the importance of further studies on this topic that can help support these professionals in their professional practice. A search of the Cochrane database and Open Science Framework (OSF) and PROSPERO - International Prospective Register of Ongoing Systematic Reviews platforms found no similar reviews involving this population, underscoring the need for further studies in this area. Therefore, the objective of the present scoping review was to analyze the available scientific evidence on nutritional interventions adoption in older adults in palliative care to help guide nutritionists who work clinically with this population.

METHOD

A scoping review was conducted according to the review method of the Joanna Briggs Institute (JBI)[7], using the PRISMA Extension for Scoping Reviews (PRISMA-ScR) reporting guidelines[8]. A protocol was developed and registered on the Open Science Framework (https://osf.io/) platform under DOI: 10.17605/OSF.IO/ECT8K (https://osf.io/ect8k). The databases searched were: Medline/PubMed, Embase, Scopus, Web of Science, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and LILACS. The search of the gray literature was carried out using Google Scholar, OpenGrey and ProQuest Dissertations & Theses Global. The backward citation search strategy was employed by consulting all references of the articles selected for inclusion in the review.

The PCC (Population, Concept and Context) strategy was used, with population defined as older adults, concept as nutritional interventions, and context as palliative care. The following guiding research question was devised: what nutritional interventions are adopted for older adults in palliative care?

Based on application of the PCC strategy, the descriptors present in the MeSH (Medical Subject Headings) and the DeCS *(Descritores em Ciências da Saúde*- Health Science Descriptors) were selected: "nutritional intervention", "*intervenção nutricional*", "palliative care", "*cuidados paliativos*", "aged" and "*idosos"*, together with their synonyms, combined using the Boolean operators (OR e AND) and adapted for each database. The full detailed strategy is available in the supplementary file containing the scoping review design via the link: https://osf.io/e6q4x/?view_only=897c5461698c48f6abe0d03ba310ac24

The process of devising the search and refinement strategy was overseen by a librarian.

The search encompassed all intervention and observational studies, with no constraints on language or search period, that assessed nutritional approaches in older adults in palliative care. Studies were excluded that did not include participants age ≥60 years; studies in which participants did not undergo nutritional intervention; reviews; abstracts; opinion articles; case reports; case series and book chapters.

After the searches, all records retrieved were exported to the EndNote reference manager, where they were grouped for automatic removal of duplicate articles. The studies were exported to the Rayaan[9] software application, where refinement of duplicate articles took place, followed by a two-stage study selection procedure.

In the two stages, 2 independent reviewers (RBBM and JMB) performed screening (reading of titles and abstracts) and reading of full texts. Any differences between the reviewers were resolved by consensus or by decision of a third reviewer (MCRG), while applying the inclusion criteria pre-defined in the protocol.

For data extraction, the reviewers created a form collecting the following information: study characteristics (authors, year of publication, country and study design), population characteristics (sample size, mean age), characteristics of signs and symptoms reported, intervention characteristics, primary and secondary outcomes, and conclusions on intervention effects.

The data were analyzed using quantitative description, expressing results as absolute and relative frequencies, and qualitative analysis was performed using theme-based categories regarding intervention effects for 3 aspects: quality of life, symptoms control and nutritional status.

In the present study, no rating of study quality or level of scientific evidence was conducted as criteria for exclusion of articles, given that, according to guidelines of the Joanna Briggs Institute for scoping reviews[7], there is no need to assess specific quality because this type of study aims to identify the available output on the topic investigated. Ethical approval was also waived, in accordance with Resolution Nº 466/2012 and Nº 510/2016 governing research ethics in Brazil.

RESULTS

An initial total of 5,942 studies were retrieved from the databases and gray literature. After removal of duplicates, 3,666 studies remained. Screening was performed by reading of titles and abstracts, where 37 articles were selected for the second stage. After reading of articles in full, 13 studies that met the eligibility criteria were selected. The backward citation search led to the selection of a further 13 articles, giving a total of 26 articles included in the review. Figure 1 depicts a flow chart showing the study selection process.

The studies included were performed on different continents, with 53.9% conducted in Europe, 23.1% in North America, 11.5% in Asia and 11.5% in Oceania, and were published between 1979 and 2021.

The study design methods were distributed as follows: Randomized Clinical Trial (RCT) 42.3%, Quasi-Experimental (QE) 26.9%, Prospective Longitudinal Cohort (PLC) 23.1%, and Retrospective Cohort (RC) 7.7%.

The characteristics of studies selected are described in Table 1.

In order to organize the results in terms of the study objectives, the main interventions and their effects were summarized and associations with 3 aspects presented: Interventions and effects on Quality of Life (Table 2), Interventions and effects on Symptoms Control (Table 3), and Interventions and effects on Nutritional Status (Table 4).

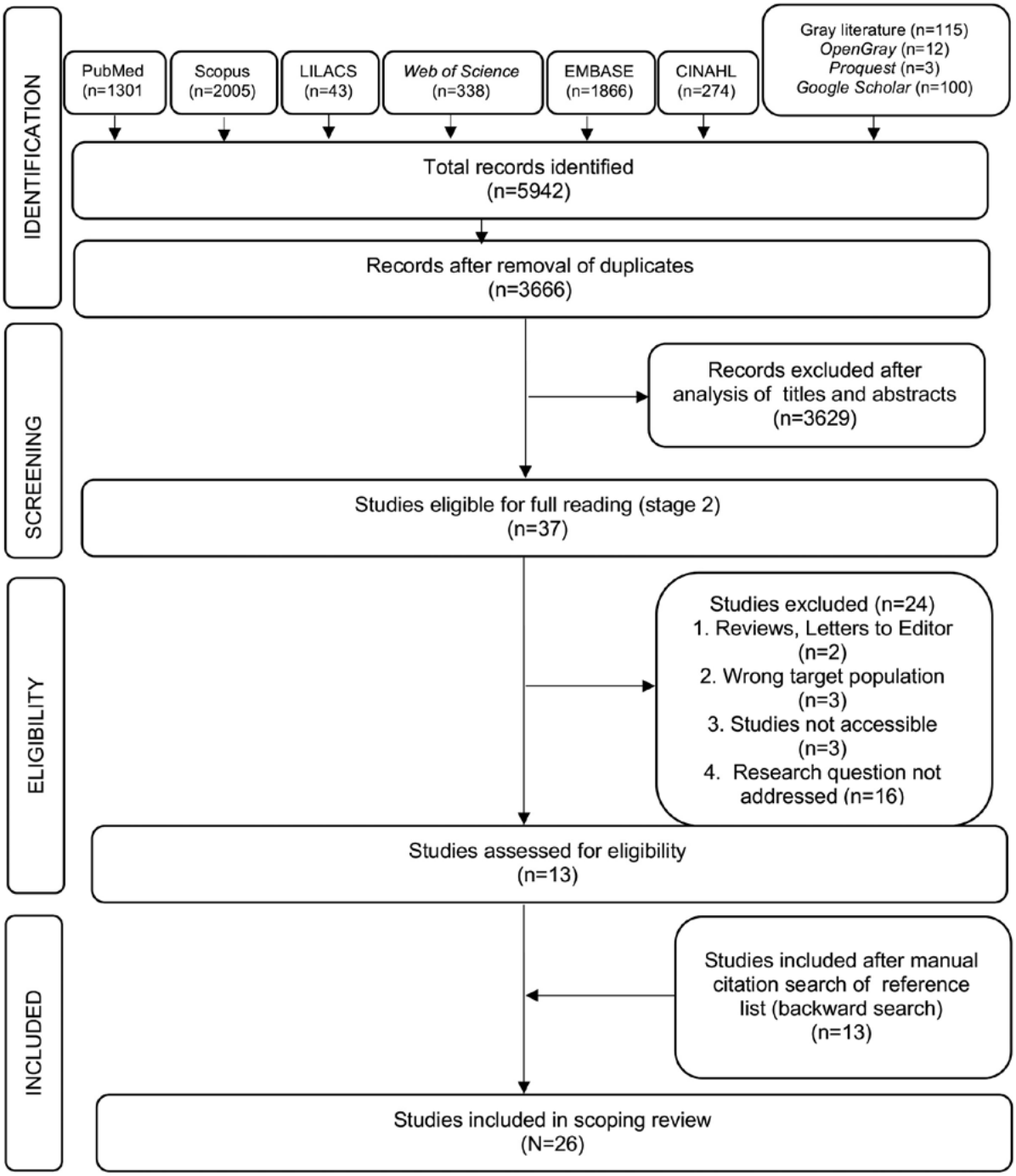

Figure 1. Flow diagram of process of search and selection of studies on nutritional interventions adopted in older adults in palliative care. João Pessoa, Pernambuco, 2022.

Source: Adapted from PRISMA-ScR[8].

Table 1. Characteristics of studies (N= 26) on nutritional interventions adopted in older adults in palliative care included in review João Pessoa, Pernambuco, 2022.

Study	Design	Population (n)	Mean age	Intervention	Intervention Objective
Amano[10] (2012), Japan	PLC	63	69 (SD: 14)	Encouragement, snacks and ONS, TPN	Bedsores, edema and antibiotic therapy
Andrew[11] (2009), UK	PLC	40	72 (62-81)	NC	Early satiation, poor appetite, xerostomia
Aramaki[12] (2019), Japan	RCT	39 (15 older adults)	62 (34-76)	PEG	QOL
Arnold[13] (1989), USA	PLC	50	64.1 (34-88)	ONS	NS
Baldwin[14] (2011), UK	RCT	358	66.8 (24-88)	NC, ONS,	Survival, QOL, NS
Barber[15] (1999), UK	QE	20	62 (51-75)	ONS with fish oil (omega 3)	Weight loss
Bouleuc[16] (2020), France	RCT	111	67 (60-72)	TPN	QOL, intake, digestive symptoms, weight
Ching[17] (1979), USA	QE	45	60-86	ONS, EN and TPN	Hypoalbuminemia
Cotogni[18] (2017), Italy	PLC	111	62 (32-79)	Home TPN	QOL
Crogan[19] (2015), USA	PLC	22	≥ 65	Lemon-lime sorbet	Xerostomia
Culine[20] (2014), France	QE	437	63 (SD: 11.4)	Home TPN	QOL, NS
Del Fabbro[21] (2011), USA	RC	151	60 (19-86)	NC and pharmacological measures	Weight loss, poor appetite
Ester[22] (2021), Canada	QE	10	64.4 (51-83)	PA, nutrition and symptom control	QOL, fatigue, low intake, xerostomia
Fearon[23] (2003), UK	RCT	200	67	Omega-3 fatty acid and antioxidants	Weight, QOL, body composition, intake
Ha[24] (2010), Norway	RCT	124	78.5 (SD: 7.4)	SNI	Malnutrition, weight loss, QOL, strength
Isenring[25] (2004), Australia	RCT	60	61.9 (SD: 14)	Early intensive intervention with NC	Weight, NS, QOL, physical function
Isenring[26] (2007), Australia	RCT	60	61.9	Early intensive intervention with NC	Protein and energy intake
Lindh[27] (1986), Sweden	QE	20	65 (51-83)	EN and TPN	Malnutrition
Lundholm[28] (2004), Sweden	RCT	309	68 ± 1	ONS and home TPN	Weight loss
Ma[29] (2020), China	PLC	50	68 (35-88)	Home TPN	NS, QOL
McCann[30] (1994), USA	QE	10	74.7 (44-92)	Small amounts of food/ fluids	Experience of hunger and thirst
Persson[31] (2002), Sweden	RCT	137	69 (48-89)	SNI	Weight, intake, QOL and survival
Ravasco[32] (2005), Portugal	RCT	75	60 (36-79)	NC and ONS	NS, morbidity and QOL
Ruggeri[33] (2020), Italy	RC	969	65.7 (±12.7)	Home artificial nutrition	Malnutrition
Senesse[34] (2015), France	QE	370	64.5 (SD: 11)	TPN	QOL and NS.
Silvers[35] (2014), Australia	RCT	21	72 (SD:12)	NC aimed at symptoms and NOS	NS, Symptoms control

PLC: prospective longitudinal cohort; TPN: total parenteral nutrition; QOL: quality of life; NC: nutritional counseling; RCT: randomized clinical trial; PEG: percutaneous endoscopic gastrostomy; ONS: oral nutritional supplementation; NS: nutritional status; QE: quasi-experimental; EN: enteral nutrition; RC: retrospective cohort; PA: physical activity; INS: individual nutritional support

Interventions and effects on quality of life

In the overall sample, 13 studies addressed nutritional interventions adopted for promoting quality of life[12,14,32,34,35,16,18,20,22–25,29]. The most frequent interventions were nutritional counseling, use of oral nutritional supplementation and home parenteral nutritional support[14,18,20,25,29,32,34,35] reporting benefits with the use of these interventions.

A multimodal intervention, which included physical activity, nutrition and symptoms control in palliative care, was adopted in one study[22], appearing to be beneficial and safe in promoting quality of life in advanced lung cancer patients. However, owing to the study design lacking a control group, further studies exploring this type of intervention are needed.

The use of percutaneous endoscopic gastronomy (PEG) in patients with malignant bowel obstruction promoted improved quality of life compared with the use of nasogastric (NG) tube, with no serious adverse events and fewer complication reported in the PEG group[12].

Only one study addressed the use of protein and energy supplements enriched with omega 3 fatty acid, promoting positive outcomes for quality of life. However, further more in-depth studies examining the potential of these supplements in the treatment of cancer cachexia are required[23].

One of the studies investigated individual nutritional support as a protection strategy in post-stroke patients at nutritional risk, using an individual nutritional treatment plan, via the oral route, or feeding tube in the case of dysphagic patients. This strategy was associated with improved quality of life[24].

Regarding impacts of nutritional counseling and use of oral nutritional supplementation on quality of life, of the 4 studies[14,25,32,35] involving this type of intervention, only 1 reported no effect on quality of life, in advanced cancer patients receiving chemotherapy[14].

Interventions and effects on symptoms control

Of the total sample, 11 studies addressed the effects of the interventions on the control of different symptoms[10,11,35,19,21,22,26,28,30–32], as presented in Table 3.

One study observed that the prevalence of bedsores, edema and the use of antibiotic was attenuated by individual nutritional support, which included nutritional counseling, the use of oral nutritional supplements and total parenteral nutrition, when necessary[10]. Individual nutritional support was also effective for improving protein-energy intake of cancer patients in 2 of the studies reviewed[28,31], while another study found improved protein-energy intake with the use of nutritional counseling and oral nutritional supplementation compared to standard practice[26].

Nutritional counseling was the intervention which promoted positive effects on the highest number of symptoms, namely: digestive symptoms, fatigue, dyspnea, poor appetite, protein-energy intake, anorexia, nausea/vomiting, xerostomia and dysgeusia[11,21,35]. Two articles investigated the positive effect of nutritional counseling with the concomitant use of oral nutritional supplement[26,32].

Xerostomia was significantly relieved with the use of sugar-free lime-lemon sorbet prior to 2 daily meals[19]. A positive outcome was also achieved using small amounts of liquids, foods and/or icechips, which also helped reduce discomfort, hunger and thirst[30].

A multimodal intervention involving palliative physical activity, nutrition and symptoms control appeared to be beneficial for reducing fatigue symptoms in advanced lung cancer patients, but further studies are needed for more robust conclusions[22].

Table 2. Interventions and effects on quality of life in studies included in scoping review. João Pessoa, Pernambuco, 2022.

Type of intervention	Results obtained
Multimodal (PA, nutrition and symptoms control)	The intervention appeared to be beneficial and safe in improving QOL in advanced lung cancer patients, but further studies are needed[22].
PEG	The use of PEG proved superior to NG as an intubation method for terminal patients with malignant bowel obstruction[12]
NC / ONS	Neither NC or ONS had an effect on QOL in patients with cancer and weight loss receiving chemotherapy [14]. Early intensive intervention with NC and ONS offered beneficial results in terms of overall QOL and physical function in patients receiving readiotherapy[25]. In cancer patients, all QOL function scores improved in the NC and ONS groups, whereas all QOL function scores worsened in controls [32]. Early intensive intervention with NC in cancer patients, and ONS prescription when indicated, promoted higher QOL functional scores for physical, emotional and social functioning in the intervention versus control group [35].
TPN/Home TPN	TPN promoted no improvement in QOL of advanced cancer patients with malnutrition, causing more severe side-effects[16]. Supplemental or total home NP was associated with improved QOL in advanced cancer patients, depending on clinical condition and oncologic state, and should be considered when patients start to lose weight or become hypophagic[18]. Home TPM was associated with improved QOL in cancer patients, but an RCT is needed[20]. Home TPN had a positive impact on NS and QOL in malnourished gastric cancer patients receiving chemotherapy shortly after start of treatment[29]. Home TPN in cancer patients promoted an overall improvement in QOL, particularly the physical component[34].
Omega 3 Fatty Acid	The analysis of potential dose-response potential showed that, if taken in sufficient quantity, only the protein and energy omega-3 fatty acid enriched supplement resulted in gain of weight, lean tissue, and improved QOL[23]
INS	INS can protect older stroke patients at nutritional risk against undernutrition and improve QOL[24].

TPN: total parenteral nutrition; QOL: quality of life; NC: nutritional counseling; PEG: percutaneous endoscopic gastronomy; ONS: oral nutritional supplementation; NS: nutritional status; PA: physical activity; NG: nasogastric tube; PN: parenteral nutrition; INS: individual nutritional support.

Table 3. Interventions and effects on Symptoms Control in studies included in scoping review. João Pessoa, Pernambuco, 2022.

Type of intervention	Results obtained
Individual support with NC, ONS and TPN when necessary	Bedsores, edema and use of ATB: Reduced prevalence of bedsores, edema and ATB use[10]
Individual nutritional support	Protein-energy intake: Estimated daily dietary intake and daily energy balance were superior in patients receiving nutritional support[28]. Individual nutritional support can promote increased energy intake in patients with gastric colorectal cancer and weight loss[31].
NC	{Digestive symptoms: Total digestive symptoms scores were significantly reduced after 2 weeks[11]. Fatigue, dyspnea and poor appetite: Early intensive intervention with NC shortly after diagnosis in upper gastrointestinal cancer patients, and ONS prescription when indicated, promoted lower scores in the intervention group on symptoms scale (indicative of improved symptoms control) compared to control group for fatigue, dyspnea and poor appetite[35]. Poor appetite: NC, associated with simple pharmacological measures, resulted in significant appetite improvement in cancer patients[21].

to be continued

Continuation of Table 3

Type of intervention	Results obtained
NC / ONS	The intensive nutritional intervention with NC and ONS resulted in improved average protein-energy intake compared to standard practice[26]. Anorexia, nausea/vomiting, xerostomia and dysgeusia. There was a 90% reduction in these symptoms in the cancer patients who received NC, 67% in the ONS group and 51% in the control group. Energy intake was increased in the NC group and was maintained throughout the 3 months[32].
Sugar-free lime-lemon sorbet prior to 2 daily meals	Xerostomia: significantly improved food intake by stimulating saliva production[19].
Multimodal (PA, nutrition and symptoms control)	Fatigue: appeared to be beneficial and safe in reducing symptoms such as fatigue in advanced lung cancer patients, but further studies are needed[22].
Small amounts of fluids and food	Hunger, thirst and xerostomia: these symptoms can be attenuated, generally with small amounts of food, fluids and/or by applying ice chips and lubrication. Providing only the food and fluids necessary to relieve patient discomfort can be more effective, satisfying the patient desires while providing discomfort relief[30].

TPN: total parenteral nutrition; ATB: antibiotic; NC: nutritional counseling; ONS: oral nutritional supplementation; PA: physical activity

Interventions and effects on nutritional status

A total of 17 studies involved interventions to improve nutritional status[13,14,28,29,31–35,15,17,20,21,23–25,27]. Five of these reported improvement in nutritional status following nutritional counseling[13,21,25,32,35]. This intervention promoted a positive outcome which was superior to the use of oral nutritional supplement alone[32], in addition to significant improvements in weight gain of cancer patientsr[21]. A randomized clinical trial[14] was the only study that failed to show efficacy of this type of intervention on nutritional status of patients with cancer and weight loss receiving chemotherapy. However, the study was suspended early upon recommendation of a data monitoring committee.

With regard to the use of omega-3 fatty acid enriched supplements, those studies which administered this intervention had conflicting results[15,23]. One of the studies showed positive results for weight gain, with a significant improvement in appetite after 3 weeks[15]. Another study compared the effect of antioxidant and omega-3 enriched supplements with a standard supplement on nutritional status over an 8-week period. It was concluded that the study failed to address the hypothesis developed from pilot data, with further studies needed to confirm the potential efficacy of the use of omega-3 enriched supplements in cancer cachexia[23].

Artificial nutrition and its efficacy for improving nutritional status of palliative patients was assessed by 7 of the studies reviewed[17,20,27–29,33,34]. Results showed that when intake of a regular diet complemented with oligomer supplement was possible, serum albumin was better preserved[17].

With regard to the use of enteral nutrition, the findings showed that this can serve as a palliative treatment for undernutrition, albeit with limited effect, with this approach being more indicated for patients with regular functional capacity, no intense pain symptoms or neurological disorders[27]. When use of enteral nutrition is indicated, special silicon tubes provide greater comfort for patients[17].

The use of total parenteral nutrition for improving nutritional status was addressed in 6 of the studies selected[17,20,28,29,33,34]. One of these investigations noted the intervention may be reserved for certain stages, particularly the pre-operative stage, and also more critical stages of care for supporting primary surgery, chemotherapy or radiotherapy for cancer[17]. Another study concluded that home parenteral nutrition can prevent death due to undernutrition in 73% of cases[33]. A 2015

study found improved weight gain in 63% of older adults with cancer[34], while another study, published in 2010, found a positive impact on both nutritional status and quality of life in malnourished patients receiving salvage chemotherapy treatment[29].

An RCT documented a significant increase in body fat over time in older cancer patients, but no difference in muscle mass between the groups was evident[28]. Similarly, a prospective observational study found that home parenteral nutrition was associated with improved nutritional status in cancer patients, recommending that an RCT be conducted to provide more solid conclusions[20].

Also, a study involving older stroke patients at nutritional risk observed that individual nutritional support can protect against malnutrition[24].

Table 4. Interventions and effects on Nutritional Status in studies included in scoping review. João Pessoa, Pernambuco, 2022.

Type of intervention	Results obtained
NC / ONS	NC and ONS maintained albumin levels in cancer patients[13]. Neither NC or ONS had an effect on NS in patients with cancer and weight loss receiving chemotherapy[14]. NC and ONS is beneficial for weight loss and NS decline in radiotherapy patients[25]. NC in cancer patients and ONS prescription, when indicated, showed higher body weight and lower nutritional risk in intervention group[35]. Improvement in NS was seen in the group receiving NC, but not in the ONS or control groups[32]. NC and simple pharmacological measures resulted in improved weight gain in cancer patients[21].
Omega 3 Fatty Acid	Omega-3 fatty acid ONS promoted greater weight gain relative to conventional supplements[15]. The use of omega 3 fatty acids conferred no therapeutic advantage. The analysis of potential dose-response potential showed that, if taken in sufficient quantity, only the protein and energy omega-3 fatty acid enriched supplement resulted in improved NS and QOL[23].
Artificial nutrition	Oligomer ONS: In older adults with cancer, serum albumin was better preserved with an adequate dietary intake or complemented with a special low residue diet. EN using special silicon tubes can be used with minimal discomfort. TPN can be reserved for more critical phases[17] Home TPN was associated with improved NS in cancer patients[20]. ONS and home TPN: Lean mass did not differ between the two groups, but changes in total fat differed. Body fat was lower in the intervention group at inclusion, but increased over time, whereas levels remained unchanged in the control group[28]. Home TPN had a positive impact on NS and QOL in malnourished patients receiving chemotherapy[29]. Home artificial nutrition can be effective for preventing death due to malnutrition and in maintaining and improving performance in 1 month[33]. Home TPN in cancer patients promoted weight improvement in patients, screening reduced nutritional risk and performance improved or stabilized. Most patients gained weight and 17.5% attained ideal weight[34]. ENS can serve as palliative treatment of progressive malnutrition in anorectic cancer patients. However, this should only be considered for patients with regular functional capacity and no intense pain symptoms or neurological disorders[27].
INS	INS can protect older stroke patients at nutritional risk against undernutrition and improve QOL[24]. INS can promote weight gain in cancer patients[31].

NC: nutritional counseling; ONS: oral nutritional supplementation; NS: nutritional status; QOL: quality of life; EN: enteral nutrition; TPN: total parenteral nutrition; ENS: enteral nutritional support; INS: individualized nutritional support.

DISCUSSION

In the sample selected, nutritional counseling, in association with use of nutritional supplementation or otherwise, was the most commonly adopted intervention among the 3 aspects evaluated: quality of life, symptoms control and nutritional status[11,13,14,21,25,26,32,35].This intervention provided patients with guidance on the amount and frequency of meals, fortifying of foods, changes in consistency, according to current clinical condition and symptoms present, as well as family support and a pleasant environment for meals, where good communication was key to achieving more successful outcomes[36]. This finding corroborates the European Society of Parenteral and Enteral Nutrition guidelines (ESPEN) guidelines[37] recommending that, for radiotherapy patients, nutritional intake should be underpinned mainly by individual nutritional counseling and/or with the use of oral nutritional supplements, improving nutritional intake, body weight and quality of life, benefitting patients and preventing interruptions in treatment[37].

Concerning survival and response to treatment, although there is often no positive impact, in some studies[36,38], nutritional counseling is recommended given that many patients report greater benefits for health and general well-being than individuals not receiving counseling. This highlights the importance of the role of the nutritionist, committed to providing, on an individual level, the guidance and recommendations needed to promote well-being and comfort of these patients[36,38].

The literature shows that, with regard to indication of artificial nutrition in older adults in palliative care, contradictions exist over its true risks and benefits[39]. In the present review, 11 studies [10,12,34,16–18,20,27–29,33] addressing this intervention were found, particularly the use of home parenteral nutritional support[18,20,28,29,33].

With regard to quality of life, only the study by Bouleuc et al.[16], of the 11 studies[10,16–18,20,27–29,33,34] on parenteral nutrition reviewed, reported negative quality of life outcomes for use of total parenteral nutrition in malnourished advanced cancer patients, noting more severe side-effects. Thus, the authors did not recommend prescribing parenteral nutrition for advanced cancer patients with a life expectancy of less than 3 months.

The ESPEN guidelines on clinical nutrition and hydration in geriatrics[40] recommend that artificial nutrition be considered as a clinical treatment rather than basic care and, hence, should be used only in cases of a realistic chance of improvement or maintenance of the patient´s quality of life. Ratifying this guidance, the practical guidelines for clinical nutrition in cancer of the Brazilian Society of Parenteral and Enteral Nutrition (BRASPEN)[41], and also of the ESPEN[42], carry a similar recommendation, stating that the benefit of nutritional support for advanced cancer patients in palliative care should be considered carefully, taking into account both the patient prognosis and survival. Patients with a good prognosis and expected overall survival of at least a few months, as well as patients with low tumor activity and no inflammatory reaction, should receive adequate counseling and nutritional support, including oral, enteral or, if necessary, parenteral nutrition or a combination of these approaches. There is little or no benefit of nutritional support in the last weeks of life, given this will result in no functional or comfort benefit for the patient[41,42].

Six of the studies[18,20,28,29,33,34] reviewed showed benefits of home artificial nutrition for quality of life and nutritional status. Similarly, Orrevall et al.[43] concluded that patients with cancer and intake and nutrient absorption deficits can be indicated home artificial nutritional support, even at advances stages of the disease, provided survival is longer than a few weeks. This benefit is evident from the extended survival of months or years seen in cancer patients receiving exclusively parenteral nutrition, patients which without feeding would have otherwise died[44].

For use of home artificial nutrition, careful patient selection is recommended, with eligible candidates presenting chronic insufficient dietary intake and/or uncontrollable poor absorption[37]. Home parenteral nutrition is a complex therapy, requiring proper screening of patients for this type of treatment. Assessment of cognitive and physical abilities of the patent prior to embarking on the training program is fundamental. In addition, the home environment,

clinical suitability, potential for rehabilitation, social and economic factors and sources of financing, should also be assessed by the multidisciplinary team before commencement of training for home parenteral nutrition[45].

Regarding nutritional status, only one[27] of the 4 studies[12,17,27,33] addressing enteral nutrition reviewed showed a limited effect of this nutritional support, which should be considered only in patients with regular functional capacity and absence of debilitating symptoms. In cancer patients, to prevent or treat malnutrition, the ESPEN guidelines recommend the use of enteral nutrition if oral nutrition is inadequate, despite the use of counseling nutritional intervention and oral nutritional supplementation, and recommend parenteral nutrition in cases where enteral nutrition proves insufficient or not possible[37].

In patients with a poor prognosis and life expectancy of just weeks or days, the literature stresses the importance of considering bioethical aspects of feeding, particularly with respect to religious, cultural and ethnic aspects, and also social, emotional and existential dimensions[37]. Complementing this aspect, the study of Cardenas[46], examined, as one of the special situations, nutritional therapy and hydration in older individuals, given that this population is at greater risk of developing malnutrition due to multiple comorbidities and associated polypharmacy. Nevertheless, the indication of artificial nutrition should be reviewed at regular intervals, weighing the risks and benefits, while respecting the principles of beneficence, non-maleficence and autonomy[46].

Another important finding of this review is the highlighting of some important strategies for the management of symptoms commonly shared by older patients in palliative care, such as xerostomia, dysgeusia, fatigue, dyspnea, poor appetite, anorexia, bedsores, edema, nausea and vomiting, with positive outcomes in all studies[10,11,35,19,21,22,26,28,30–32] addressing this management, where nutritional counseling emerged as the most used intervention for symptoms relief.. Consistent with these findings, Pinho-Reis[47] described the management of many of these symptoms, using nutritional counseling strategies, while also addressing the need for changing feeding routes[47].

Nutritional care in the context of managing symptoms encompasses different interventions, including for instance nutritional counseling, enriching meals, provision of snacks, changing consistencies, administration of oral nutritional supplements, as well as enteral and parenteral nutrition, which can mutually complement one another in terms of their effects on the symptoms. However, nutritional care goes beyond interventions, also covering feeding assistance, adaptation of environmental factors and eliminating underlying causes, thus calling for multidisciplinary action involving nutritionists, nurses, helpers for general services, cooks, physicians, therapists, family members, caregivers and the patients themselves[40].

Symptoms assessment in palliative care includes both objective and subjective components and requires the use of validated scales and tools available to guide professionals in assessing pain and other sources of suffering, e.g. the Edmonton Symptom Assessment Scale (ESAS), widely used in research of palliative care for its ease of use as a system or manually as a checklist[48].

Only 2 of the studies selected[15,23] explored the use of omega 3 fatty acid. Of these, the study by Fearon et al.[23] concluded that the study failed to demonstrate that use of supplements enriched with this nutraceutical compound promoted anabolism in patients with cachexia. However, analysis of the dose-response potential showed that, if used at sufficient quantity, this intervention promoted net weight and lean tissue gains and improved quality of life. The study by Leite et al.[49] showed several benefits of omega 3 supplementation in the promotion of quality of life of patients receiving cancer treatment, providing improvements in inflammatory and immunological response, muscle synthesis, xerostomia, healing of surgical wounds and cancer-induced cachexia. Similarly, the guidelines of the BRASPEN[41] recommend omega-3 supplementation for patients on chemotherapy, who are malnourished, or experiencing weight loss, with the aim of establishing or enhancing appetite. This guideline, however, emphasizes that the evidence supporting the use of omega 3 remains inconclusive, requiring further studies to determine the ideal dose and timing for its use.

The present review has important implications for the practice of nutritionists, and also contributes to future studies. This is the case because the majority of nutritionists involved in palliative care, particularly end-of-life, are not specifically trained in palliative care, highlighting the tendency for therapeutic obstinacy, overlooking the distress caused by some interventions and failing to recognize the need to minimize ethical conflicts in decision-making[50]. This knowledge must be disseminated among nutritionists, with the exchange of experiences on care protocols used in each care setting designed for older patients in palliative care, guiding professional conduct in this area. It is also important to revisit spiritual aspects and the role of the nutritionist, toward performing a full holistic assessment.

Regarding design methodology of the studies, there were 11 RCTs[12,14,35,16,23–26,28,31,32] and 6 prospective longitudinal cohort studies[10,11,13,18,19,29] involving nutritional interventions. There were also 7 quasi-experimental studies[15,17,20,22,27,30,34] and only 2 retrospective cohort studies[21,33]. Of the 26 studies reviewed, only 11 were published within the last 10 years[10,12,35,16,18–20,22,29,33,34], pointing to the need to carry out more multi-center studies with greater methodological rigor that can elucidate the most effective nutritional interventions in clinical practice for the older patient population in palliative care.

The present study has some limitations. Although mean age of participants of the studies was >60 years, most studies did not stratify results for the older adult age group, precluding analysis of specific data for this population. Six studies involved cohorts comprising 10-22 participants[15,19,22,27,30,35], thereby limiting generalization of results. Concerning symptoms management in the studies reviewed, there was an absence of interventions involving symptoms common in the older population in palliative care, such as constipation, diarrhea and mucositis.

CONCLUSION

The present review mapped the main nutritional interventions adopted in older adults in palliative care. The findings highlight the need of knowledge by nutritionists on these interventions, and of further studies to build on this evidence.

Nutritional counseling was identified as providing best results across all aspects assessed, where nutritionists must be alert to the specific recommendations for patients to cater for the individual needs of each. Artificial nutrition was consistently reported as a means of promoting improvement in nutritional status and, consequently, in quality of life in the vast majority of the studies, requiring careful assessment of disease stage and life expectancy. Further studies should be carried out to elucidate the true contribution of omega 3 fatty acid to quality of life and nutritional status. Symptoms management should be conducted individually, with the goal of promoting comfort and relief according to patient needs. This requires a thorough evaluation of the intensity and type of symptoms presented, with interdisciplinary collaboration and using specific assessment tools. Although gaps in the literature on interventions adopted for older patients in palliative care exist, the vital role of the nutritionist in relieving suffering, promoting comfort and enhancing quality of life of this population is clear.

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