

REVIEW ARTICLE

Nursing Practices and Quality Indicators in Enteral Nutritional Therapy: A Scoping Review

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Highlights:

- (1) Evidence on Quality Indicators in Nutritional Therapy directly related to nursing practices in the care of hospitalized adult patients.
- (2) The Quality Indicator in Nutritional Therapy most cited in the literature is related to eliminations from Nutritional Therapy.
- (3) There is little role for nursing around Quality Indicators in Nutritional Therapy.

ABSTRACT

The objective of this paper is to summarize the findings of publications on Quality Indicators in Nutritional Therapy that are directly connected to nursing practices in the care of adult patients who have been hospitalized. This is a scoping review that has selected original articles spanning from 2000 to 2023, in Portuguese, English, and Spanish, sourced from PubMed, Cochrane, BDNF, Embase, CINAHL, Scopus, Web of Science, and Google Scholar. Regarding the results, of the 26 studies included, the majority are national (96.1%), published between the years 2018-2023 (65.3%), all with at least one nutritionist as author, only in two with nurse authorship and carried out in an Intensive Care Unit (65.3%). The most common indicator for nursing practices was the number of times patients on Enteral Nutritional Therapy had diarrhea (73%). The least accurate indicator was the number of times patients had constipation while on Enteral Nutritional Therapy. The study found that although Quality Indicators in Nutritional Therapy are often described in the literature, nursing does not play a leading role in the studies. Both the most-described indicators and the least-described indicators were related to eliminations.

Keywords: Enteral Nutrition; Quality Indicators Health Care; Nursing; Hospitalization; Review.

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INTRODUCTION

Enteral Nutritional Therapy (ENT) aims to restore or maintain nutritional status, either temporarily or permanently, by providing nutrients to individuals who are unable, unwilling to, and unable to eat orally ^(1,2). The different stages involved in ENT are not without risk of gastrointestinal ⁽³⁾, metabolic ⁽⁴⁾, respiratory ⁽⁵⁾ and mechanical ⁽⁶⁾ complications. The nursing team must play an active role in the success of ENT and the prevention of incidents and adverse events ⁽⁷⁾, and the adoption of nursing care contributes significantly to this ^(8,9).

Considering that the nursing team is the group of professionals with the most contact with the patient ⁽¹⁰⁾ and is often the first to identify deviations from normality and complications of ENT, it makes it possible to establish barriers to possible errors in the process and guarantee the safe administration of Nutritional Therapy (NT). The responsibilities of nursing in caring for patients undergoing ENT are determined by specific legislation ^(11,12).

Quality Indicators for Nutritional Therapy (QINT) ^(13,14) are tools for evaluating the effectiveness of the therapy used, to improve the performance of procedures, as well as improving nutritional and health care. In Brazil, the International Life Sciences Institute (ILSI) ⁽¹⁰⁾ currently suggests monitoring 32 indicators, some of which are directly related to nursing practices: (a) frequency of inadvertent delivery of Enteral Nutrition (ENT) tubes in patients on ENT, (b) frequency of obstruction of nutrition tubes in patients on ENT, (c) frequency of days of adequate administration of the prescribed volume versus the infused volume of ENT and (d) frequency of diarrhea in patients on ENT. Monitoring these QINTs supports care management by the nursing team ⁽¹⁰⁾.

A study ⁽¹⁰⁾ carried out in 57 Brazilian hospitals to evaluate the use of QINT identified that the difference between the prescribed volume and the infused volume of diet was the most cited, by 81% of the institutions. Monitoring this indicator makes it possible to know the frequency of days on which the supply of infused volume was adequate, to identify the factors that interfere with this difference, and to propose corrective measures. In hospitalized patients, studies have reported discrepancies between the prescribed and infused volume of NT ⁽¹⁵⁻²¹⁾.

A study ⁽¹⁹⁾ that assessed the nutritional status of patients using exclusive ENT for more than 72 hours in an adult Intensive Care Unit (ICU) found that only 36.1% had an adequate ratio between the volume of NT prescribed and that infused. Of the 1000 mL/day of diet prescribed/day, the average volume received by patients was 780.85±193.12 mL/24h. Another study, carried out in an adult ICU ⁽¹⁷⁾, found a lower average over the two weeks of patient follow-up: from the 1st to the 7th day of hospitalization, the prescribed volume was 778.5±134.2, while the infused volume was 652.5±182.2; from the 8th to the 14th day, the prescribed volume was 992.9±208.7, while the infused volume was 822.5±252.7.

Professionals in the fields of nutrition and medicine conduct most studies on QINT. Few nurses have dealt with this issue, especially in Brazil. To this extent, there are gaps in identifying and interpreting the findings, considering the practices of this group of professionals who, as already mentioned, provide full-time patient care. Thus, knowing the interface of nursing practices in monitoring patients on ENT can reduce risks ⁽²²⁾ and, consequently, costs.

Different national organizations, such as the Brazilian Society of Parenteral and Enteral Nutrition (SBNPE, in Portuguese) ⁽²³⁾, the Hospital Quality Commitment Program (CQH) ⁽¹³⁾, ILSI-Brazil ⁽¹⁰⁾, and the Federal Nursing Council ⁽¹²⁾, recommend that nurses monitor QINTs in hospitals, providing support for preventive actions, optimizing human resources, and reducing costs. These same organizations also recommend that research be carried out to scientifically support the care of ENT users, to increase patient safety.

Based on this context, a preliminary search was carried out on the Embase, JBI and PUBMED databases and no scoping reviews, current or ongoing protocols on QINTs and their interface with nursing practices were identified. Thus, the main objective of this review is to summarize findings from publications on QINTs directly related to nursing practices in the care of hospitalized adult patients. As a secondary objective, to measure the results of these QINTs in terms of their suitability for their respective goals.

METHOD

This is a scoping review study (ScR), built according to the guidelines of the Joanna Briggs Institute Reviewer’s Manual (JBI) ⁽²⁴⁾ and the theoretical framework proposed by Arksey and O’Malley⁽²⁵⁾. To begin the review, the guiding question was established according to the PCC (Population, Concept and Context) mnemonic structure: what are the QINTs directly related to nursing practices in the care of hospitalized adult patients, available in the literature?

The recommendations of the Preferred Reporting Items for Systematic reviews and MetaAnalyses extension for Scoping Reviews (PRISMA-ScR) checklist were followed ⁽²⁶⁾. The study followed the following stages: (1) identification of the research question; (2) establishment of eligibility criteria; (3) data collection; (4) extraction of results; and (5) presentation of results. The sixth step of the consultation, the critical appraisal of sources of evidence, considered optional in this type of review, was not carried out. The review protocol has not been published.

The eligibility criteria followed the structure of the PCC acronym, with P - adult patients (aged > 18 years), of both sexes, exclusively using EN (by nasoenteral tube, gastrostomy, and/or jejunostomy); C - studies that investigated QINTs directly related to nursing practices; and C - any hospital clinical care unit. To select the indicators used in the review, those that are directly related to nursing practices in the care of hospitalized adult patients were considered.

Chart 1 - Quality Indicators in Nutritional Therapy eligible for the scope review, and their respective formulas and targets, according to the International Life Sciences Institute (ILSI)⁽¹⁰⁾. Porto Alegre-RS, Brazil, 2023.

Indicator	Formula	Target
Frequency of inadvertent EN tube exits in patients on ENT	$\frac{\text{No. of inadvertent enteral tube exits} \times 100}{\text{Total no. of patients on ENT} \times \text{No. of days with an enteral tube}}$	<5% (ICUs) <10% (wards)
Frequency of nutrition tube obstruction in patients on ENT	$\frac{\text{No. of obstructed tubes in patients on ENT} \times 100}{\text{Total no. of patient-days on ENT}}$	≤5% (ward) ≤10% (ICU)
Frequency of days of adequate administration of the prescribed volume X infused volume in patients on NT	$\frac{\text{No. of patients with inadequate volume of ENT} \times 100}{\text{No. of patients on ENT}}$	≥80%
Frequency of diarrhea in ENT patients	$\frac{\text{No. of patients on ENT with diarrhea} \times 100}{\text{Total number of patients on ENT}}$	≤10%
Frequency of constipation episodes in ENT patients	$\frac{\text{No. of patients on ENT with constipation} \times 100}{\text{No. of patients on ENT}}$	<20%
Frequency of episodes of abdominal distension in patients on ENT	$\frac{\text{No. of patients with abdominal distension on ENT} \times 100}{\text{No. of patients on ENT}}$	<15%

Enteral Nutritional Therapy (ENT); Enteral Nutrition (EN); Nutritional Therapy (NT); Number (N.º); Intensive Care Unit (ICU).

The review considered primary research with quantitative designs, including experimental, descriptive studies, and observational studies, reporting any quantitative data that could be included in the review and/or qualitative/mixed methods studies. The languages included were Portuguese, English, or Spanish, available in full online through the CAPES Journal Portal, CAFE access - university. The time frame used was from the year 2000, considering the publication of the first Brazilian regulation to establish the minimum requirements for ENT in Brazil (RDC No. 63 of July 6, 2000) ⁽²⁷⁾, until the year 2023.

Following the recommendations of the JBI ⁽²⁴⁾, this review was conducted in three stages: (1) mapping the terms according to the PCC acronym, to identify primary studies on the subject and possible descriptors/mesh terms/mtree's in the titles and abstracts, to broaden the search; (2) developing the search strategy according to the specificities of each source of information, either adopting descriptors or mesh terms or emtree's (Chart 2): MEDLINE/PubMed, Cochrane Central, BDEFN/BVS, Embase, CINAHL, Scopus, Web of Science and Google Scholar; (3) checking the reference list of included articles to select additional studies. The bibliography manager, Mendeley Desktop software, version 1.19.2, was used to organize the included studies.

Chart 2 - Search strategy used in review C- Porto Alegre-RS, Brazil, 2023.

Informational resource	Search strategy
MEDLINE/ Pubmed	("Enteral Nutrition" OR "Enteral Feeding" OR "Feeding Tube, Gastric" OR "Gastric Feeding Tube" OR "Gastric Feeding Tubes" OR "Tube Feeding") AND ("Quality Indicators, Health Care" OR "Quality Indicators" OR "Quality Indicator")
COCRAHNE LIBRARY	("Enteral Nutrition" OR "Nutrition Therapy") AND ("health care quality" OR "Quality Indicator" OR "Quality Indicators") in All Text: Limites: trials
BDEFN (BVS)	(nutrição enteral" OR "alimentação enteral" OR "alimentação por sonda" OR "alimentação por tubo" OR "Terapia Nutricional") AND ("Indicador de Qualidade" OR "indicadores de qualidade em assistência à saúde")
EMBASE	'enteric feeding' AND 'health care quality' (all feeds)
CINAHL	AB (("Enteral Nutrition" OR "Enteral Feeding" OR "Feeding Tube, Gastric" OR "Gastric Feeding Tube" OR "Gastric Feeding Tubes" OR "Tube Feeding") AND AB ("Quality Indicators, Health Care" OR "Healthcare Quality Indicator" OR "Healthcare Quality Indicators" OR "Quality Indicator" OR "Quality Indicators"))
SCOPUS	(TITLE-ABS-KEY (("Enteral Nutrition" OR "Enteral Feeding" OR "Feeding Tube, Gastric" OR "Gastric Feeding Tube" OR "Gastric Feeding Tubes" OR "Tube Feeding")) AND TITLE-ABS-KEY ("Quality Indicators, Health Care" OR "Healthcare Quality Indicator" OR "Healthcare Quality Indicators" OR "Quality Indicator" OR "Quality Indicators"))
WEB OF SCIENCE	"Enteral Nutrition" OR "Enteral Feeding" OR "Feeding Tube, Gastric" OR "Gastric Feeding Tube" OR "Gastric Feeding Tubes" OR "Tube Feeding" (Topic) and "Quality Indicators, Health Care" OR "Quality Indicators" OR "Quality Indicator" (Topic)
GOOGLE SCHOLAR	"enteral nutrition" "quality indicators"

The search was carried out in each database in August 2023. The process of selecting the studies and analyzing them was carried out in a double-independent manner, with disagreements decided by a third reviewer. Titles and abstracts were read, full articles were read, and the reference list of each included article was checked. The mapping was organized in a synoptic table in Word containing the

following information: year of publication/country of origin, author/professional category, objective, study design, participants/scenario, and QINT assessed.

To compile and present the results, a table was drawn up with the characteristics of the studies to summarize the QINTs monitored by nursing. In addition, the main results of these QINT were summarized in the review and the adequacy of the goals proposed by ILSI-Brazil was verified ⁽¹⁰⁾.

RESULTS

The search strategy identified a total of 2,451 publications, of which 45 studies were selected for reading in full; 19 were excluded (four because they were not developed in a hospital environment and 15 because they did not include any QINT for which nursing is responsible). As a result, 26 articles were effectively included in the review (Figure 1).

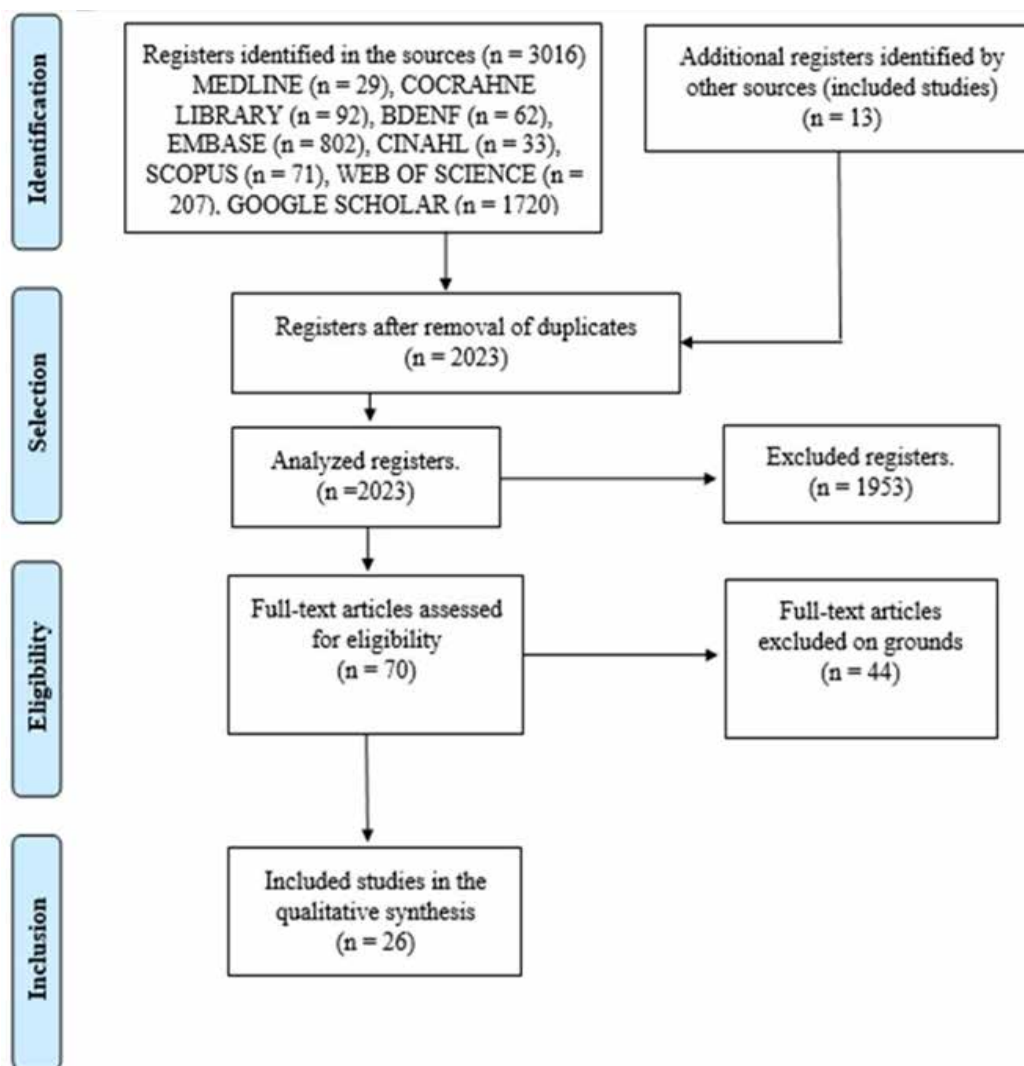


Figure 1 - Flowchart of the selection of publications, according to PRISMA Extension for Scoping Reviews (PRISMA ScR)- ⁽²⁶⁾Porto Alegre-RS, Brazil, 2023.

Many of the studies were carried out in Brazil (n = 25; 96.1%), with just one in Spain (3.8%) (Chart 3). In addition, it was possible to see the interest and growth of research on the subject, especially in the years 2018-2023 (n = 17; 65.3%). As for the professional category, it was found that in all the

studies included in this review, nutritionists and nutritionist teachers were among the authors (n = 26; 40 different authors); after doctors (n = 06; 10 authors), and the nursing team was the least involved in the research (n = 02; three authors). The participants in the studies totaled 2,916 patients. Most of the studies were carried out in ICUs (n = 17; 65.3%), clinical units (n = 06; 23%), and simultaneously in ICUs and clinical units (n = 03; 11.5%), in university hospitals (n = 12; 46.1%), public hospitals (n = 10; 38.6%), private hospitals (n = 03; 11.5%) and teaching hospitals (n = 01; 3.84%).

Regarding the QINTs directly related to nursing practices eligible for this review, it was identified that all were described in the literature and that studies commonly investigated more than one type of indicator. The indicator “Frequency of diarrhea in patients on ENT” was the most evaluated among the studies (n = 19; 73%), followed by “Frequency of days of adequate administration of the prescribed volume X infused volume in patients on NT” (n = 14; 53.8%) and “Frequency of inadvertent EN tube exits in patients on ENT” (n = 12; 46.1%).

Chart 3 - Description of the studies included in the review in chronological order of publication. Porto Alegre, RS, Brazil, 2023.

ID/Year/Country/ Category of authorship	Objective	Study Design/ Participants/ Setting	QINTs evaluated	Limitations
(28) 2009/Brazil/ Nutritionist and Doctor	Monitoring the adequacy of enteral nutritional therapy in the intensive care unit to improve the quality of nutritional care.	Prospective, observational. -116 patients (over four years) / ICU of a university hospital.	-Frequency of inadvertent removal of the enteral tube in patients on ENT α -Frequency of diarrhea episodes in patients on ENT β	It does not describe sample calculation; small sample (per year investigated); quarterly analysis of indicators; the “frequency of diarrhea” indicator was not calculated for all the years evaluated; for the “inadvertent tube outlet” indicator, only those in which it was necessary to pass on the NET were counted.
(29) 2010/Brazil/ Teaching Nutritionist, Physician	Analyze the adequacy of ENT, with a view to improving the quality of nutritional care.	Prospective, observational. - 147 patients (over five years) / Adult ICU of a university hospital.	-Inadvertent removal of the enteral tube in patients on ENT α -Frequency of diarrhea in ENT β patients	Does not describe sample calculation; small sample (per year investigated); quarterly analysis of indicators; and for the indicator “inadvertent tube outlet,” only those in which it was necessary to pass on the NET were counted.
(30) 2014/Brazil/ Nutrition student, Nutritionist, Nutritionist lecturer.	Apply the QINTs enterally in a closed system.	Retrospective, cross-sectional. -72 patients - medical records / adult ICU and inpatient unit of a private hospital.	- Episodes of diarrhea α - Episodes of constipation β -Inadvertent tube leakage α .	It does not describe sample calculation; small sample; retrospective study; quarterly analysis of indicators; clinical heterogeneity of patients; results of indicators are not described by unit; they point to the absence of records in medical charts, which was characterized as “no information”.
(31) 2015/Brazil/ Nutritionists.	Monitoring nutritional care in surgical patients using the QINTs.	Longitudinal, observational, analytical - 37 patients/ clinical surgical unit of a regional hospital.		Does not describe sample calculation; small sample; indicator day-estimate; patients using combined ENT (oral and parenteral); use of secondary data.

(32) 2016/Brazil/ Nutrition student and nutritionist lecturer.	To describe the nutritional status of septic elderly patients undergoing NT in an ICU and to apply quality indicators in NT.	Retrospective, observational. -30 patient records/ Adult ICU of a private hospital.	- Frequency of diarrhea episodes α .	Does not describe sample calculation; small sample; patients using combined ENT (oral and parenteral); for the evaluation of the indicator, the information cited in the medical record as diarrhea was considered; biannual evaluation of the indicator.
(33) 2017/Brazil/ Nutritionist, Doctor, Lecturer Nutritionist, Doctor Lecturer.	Controlling the quality of NE in cancer patients at nutritional risk.	Prospective, observational, descriptive. -211 patients/ Hospital Cancer Institute.	- Frequency of patients with EN volume above 70% of the prescribed volume β - Frequency of diarrhea episodes β . - Frequency of constipation episodes in patients with EN α .	Does not describe sample calculation; biannual evaluation of the indicator.
(34) 2017/Brazil/ Lecturer, Nutritionist.	To assess the frequency of inadvertent exit from the NET system in patients on ENT and the frequency of obstruction of the NET system in patients on ENT.	Prospective, observational - 27 patients/ Clinical and surgical ICU of a tertiary public hospital	- Frequency of inadvertent of enteral tubes in patients on ENT α . - Frequency of enteral tube obstructions in patients on ENT α .	Small sample; patients using combined (oral and parenteral) ENT; the position of the EN tube was confirmed by auscultation and, in some cases, by radiographic examination. Radiological examination; evaluation on sequential days of the indicators (eight weeks).
(35) 2017/Brazil/ Nutritionist, Nutritionist lecturer.	Evaluate the adequacy of EN by applying the QINT in the ICU.	Longitudinal, descriptive. -53 patients/ cardiac and general ICU of a university hospital.	- Frequency of diarrhea episodes in patients on ENT α .	Does not describe sample calculation; small sample; biannual evaluation of the indicator.
(36) 2018/Brazil/ Nutritionist, Doctor, Nurse, Pharmacist.	To evaluate the quality indicators of ENT at the University Hospital of the Federal University of Piauí (HU-UFPI) University Hospital of the Federal University of Piauí (HU-UFPI), to verify the quality of the service offered to patients undergoing ENT.	Retrospective, observational, analytical. - 50 patients - adult ICU records and nursing stations of a university hospital.	- Comparison and adequacy of the prescribed and administered β . - Frequency of complications related to enteral enteral nutrition β .	Does not describe sample calculation; small sample; retrospective study; two-month evaluation of indicators; clinical heterogeneity of patients.
(37) 2018/Brazil/ Nutrition student, Nutritionist lecturer.	Applying QINT in a trauma ICU in the municipality of Curitiba, PR, Brazil and compare the results obtained between 2014 and 2015.	Retrospective, observational, descriptive. - 338 patients - medical records / trauma ICU of a university hospital.	-Frequency of diarrhea episodes α -Adjustment of infused volume in relation to that prescribed for patients on ENT β .	Does not describe sample calculation; small sample; or retrospective study.

(38) 2018/Spain/ Doctor and Nurse.	Evaluate compliance with the clinical quality indicator “EN monitoring”.	Not described. - 386 patients/ adult ICU of a university clinical hospital.	-EN monitoring*.	It does not describe sample calculation; the indicator assessed is made up of several components, generating ambiguous interpretations. The results are presented as independent percentages for each component.
(39) 2018/Brazil/ Nutritionist, Nutritionist lecturer, Medical lecturer	Apply and monitor QINT for critically ill patients at nutritional risk	Cross-sectional -93 patients/ Adult ICU of a university hospital	- Frequency of patients with EN volume above 70% of the prescribed volume β . - Frequency of diarrhea episodes β . - Frequency of inadvertent EN tube exits α .	Does not describe sample calculation; small sample (per year investigated); patients using combined ENT (oral and parenteral).
(40) 2018/Brazil/ Nutritionist, Dental lecturer.	Propose a way of controlling and monitoring enteral nutritional therapy and evaluate its effectiveness.	Retrospective, observational, analytical. -94 patients - records/ Adult ICU of a university hospital.	-Frequency of diarrhea episodes β .	Does not describe sample calculation; retrospective study.
(41) 2018/Brazil/ Nutritionist, Nutritionist lecturer	Evaluating the ENT service in patients admitted to in the medical and surgical wards of a public hospital in Salvador-BA, by applying quality indicators.	Prospective, longitudinal, observational. - 114 patients/ ward of a public hospital.	- Frequency of of the enteral tube α . - Frequency of obstruction of tube α . - Percentage of patients with infused enteral nutrition volume greater than 70% of that prescribed β .	Does not describe sample calculation.
(42) 2019/Brazil/ Nutritionist, Nutritionist lecturer.	Evaluate the quality and effectiveness of current nutritional therapy practices in the adult ICU of a teaching hospital by applying therapy quality indicators.	Retrospective, cross-sectional. -90 patients - adult ICU records of a teaching hospital.	- Frequency of diarrhea in ENT β patients. - Frequency of nutrition tube obstruction in ENT β patients. - Frequency of inadvertent EN tube exit in patients on ENT α .	Does not describe sample calculation; retrospective study; or patients using combined ENT (oral and parenteral).
(43) 2019/Brazil/ Nutritionist and nutritionist lecturer.	To evaluate the quality of the ENT offered to hospitalized cancer patients.	Cross-sectional, descriptive. -31 patients/ wards of Internal Medicine, Surgical and ICU wards of a university hospital.	- Frequency of inadvertent in patients on ENT α . - Frequency of ES obstruction in patients on ENT α . - Frequency of diarrhea episodes in patients on ENT β . - Frequency of constipation episodes in patients on ENT β . -Frequency of abdominal distension in patients on ENT β .	Does not describe sample calculation; small sample.

(44) 2019/Brazil/ Nutritionists.	To evaluate, by quality indicators, the enteral nutritional support offered to patients admitted to the medical clinic of a public hospital in the Federal District.	Retrospective, quantitative, qualitative, longitudinal. - 169 patients - medical records/ward of a regional hospital.	- Frequency of diarrhea in patients on ENT α . - Frequency of constipation episodes in patients on ENT α .	Does not describe sample calculation; retrospective study.
(45) 2019/Brazil/ Nutritionist, Nutritionist lecturer.	Applying QINT in a university hospital in Sergipe.	Retrospective, cross-sectional. - 120 patients - medical records and ICU of a university hospital.	- Frequency of diarrhea episodes in patients on ENT α . - Frequency of constipation episodes in patients on ENT β . - Frequency of inadvertent removal of the enteral tube α .	It does not describe sample calculation; retrospective study; biannual evaluation of the indicator; clinical heterogeneity of the patients; they point to missing records in the medical charts, which was characterized as "not informed".
(46) 2019/Brazil/ Nutrition student, Nutritionist, Nutritionist lecturer	Analyze QINT in an ICU	Retrospective, observational - 122 patients/ records/ICU of a private hospital	-Frequency of diarrhea in ENT α patients. - Frequency of inadvertent removal of the nutrition tube in patients on ENT α . - Frequency of nutrition tube obstruction in ENT α patients. -Adequacy rate of the infused volume about that prescribed in patients on ENT β .	Does not describe sample calculation; retrospective study; biannual evaluation of the indicator; mentions that the factors that triggered the quality deviations of the indicators.
(47) 2020/Brazil/ Nutritionists and Nutritionist lecturer.	To evaluate the frequency of adequacy of QINT of ENT and/or parenteral nutrition in hospitalized patients and to identify the best indicators according to health professionals.	Prospective. - 101 patients/ clinical and surgical wards of a tertiary hospital.	- Adequate frequency of administration of prescribed X infused volume in ENT β patients. -Inadvertent removal of enteral tube in patients on ENT β . - Frequency of nutrition tube obstruction in ENT β patients. - Frequency of diarrhea in ENT β patients.	It does not describe sample calculation; patients using combined ENT (oral and parenteral); the results of the indicators are not described by unit; they point out that clinical records are filled in by professionals and there may be some loss of data.
(48) 2020/Brazil/ Nutritionist and Lecturer nutritionist.	To evaluate the QINT of patients under ENT admitted to the ICU of a public trauma referral hospital.	Retrospective, descriptive. - 96 patients - medical records / trauma ICU of a public hospital.	-Adequacy rate of the infused volume in comparison to the prescribed volume in patients on ENT β . - Frequency of GI-related complications β .	It does not describe sample calculation; a small sample; or a retrospective study; they mention the failure to evaluate the causes of interruption and/or failure to administer ENT properly, given the lack of information in the nutritional monitoring forms.

(49) 2020/Brazil / Nutritionists.	Applying the quality indicators for ENT in patients with advanced cancer in palliative care care.	Observational, quantitative-descriptive. -50 patients/ palliative care unit of a cancer hospital institute.	- Frequency of inadvertent EN α tube exits. - Frequency of days of adequate administration of prescribed volume versus infused volume β . - Frequency of diarrhea α - Frequency of episodes of abdominal distension α - Frequency of constipation episodes α .	Does not describe sample calculation; small sample; biannual evaluation of the indicator; heterogeneity of the sample.
(50) 2020/Brazil/ Nutritionist, nutritionist lecturer.	To evaluate the quality indicators of enteral nutritional therapy in elderly patients admitted to the University Hospital of Lagarto-SE.	Observational, cross-sectional. - 43 patients/ Adult ICU of a university hospital.	-Inadvertent exit of the NE α probe. - Obstruction of the NE β probe. -Diarrhea β . - Constipation β .	Does not describe sample calculation; small sample; biannual evaluation of the indicator.
(51) 2020/Brazil/ Nutritionist, Pharmacist, Nurse lecturer.	To investigate the quality indicators of ENT in elderly people in the ICU of a university hospital in João Pessoa-PB, Brazil.	Retrospective, cross-sectional. - 79 elderly patients - medical records/adult ICU of a university hospital.	- Adequate frequency of administration of infused in patients on ENT α . - Frequency of diarrhea in ENT α patients. - Frequency of constipation episodes in ENT α .	Convenience sample; retrospective study; they mention that they did not adjust the association for possible confounding factors, such as the severity and age of the patients; for some variables, there was a lack of records in the nutritional monitoring forms (in the indicators of prescribed X infused volume and diarrhea).
(52) 2022/Brazil/ Nutritionist, Doctor, Nursing student, Nutrition student, Nutritionist, Medical lecturer.	Analyze the ENT and the clinical evolution of patients hospitalized with COVID-19 in Brazil	Retrospective. - 112 patient records / COVID ICU of a referral hospital for cardiology and pulmonology.	-Adequate frequency of administration of the volume prescribed X infused volume in ENT α patients.	Retrospective study; evaluation on sequential days of the indicator.
(53) 2023/Brazil Nutritionists, Nutritionist lecturer.	Analyze quality indicators to identify the frequency of ENT-related events.	Cross-sectional, retrospective. - 135 patients - medical records/ ICU of an emergency and trauma hospital.	- Adequate frequency of administration of prescribed X infused in patients on ENT α .	Convenience sample; retrospective study; point-in-time evaluation (single month) of the indicator.

α QINT with formulas and targets in line with the Guideline adopted in this review (ILSI, 2018). β QINT with formulas and targets different from the current Guideline (ILSI, 2018). *Indicator recommended by the Spanish Society of Intensive and Critical Care Medicine and Coronary Units (SEMICYUC) which fundamentally measures the efficacy of EN, comprising the monitoring of different aspects. ICU: Intensive Care Unit; ENT: Enteral Nutritional Therapy; ENT: Enteral Nutrition; NNS: Nasoenteral Tube; IQTN: Quality Indicator in Nutritional Therapy; SE: Sergipe.

Regarding the suitability of the QINTs for the targets proposed by the ISLI⁽¹⁰⁾, it was found that the QINT “Frequency of constipation episodes in patients on ENT” was the one that showed the least suitability for the target set for hospitalized adult patients, since only one of the eight studies analyzed was suitable for the target (Chart 4). “Frequency of inadvertent EN tube exits in patients on ENT” was the indicator that showed the best results in terms of meeting the target.

Chart 4 - Quality Indicators in Nutritional Therapy ⁽⁷⁾ and the adequacy of their respective targets according to the International Life Sciences Institute (ILSI) ⁽¹⁰⁾. Porto Alegre-RS, Brazil. 2023.

Indicator	Target	Adequate results	Inadequate results
Frequency of diarrhea in patients on ENT.	≤10%	2.06% (year 1) and 6.76% (year 2) in ICU ⁽²⁹⁾ .	25% (< 14 days of hospitalization); and 46.6% in ICU (> 14 days of hospitalization) ⁽⁵¹⁾ .
		6.76% in ICU ⁽²⁸⁾ .	17.2% in ICU (n=33) ⁽⁴⁷⁾ .
		2.19% in ICU ⁽⁴²⁾ .	13% (month 1); 21% (month 2); and 25% (month 3) in the surgical clinic unit ⁽³¹⁾ .
		2.0% in an oncology palliative care unit ⁽⁴⁹⁾ .	24% (year 1) and 31% (year 2) in trauma ICUs ⁽³⁷⁾ .
		10% in septic patients in the ICU ⁽³¹⁾ .	10.5% (year 1); 9.2% (year 2); and 10.5% (year 3) in ICU ⁽³⁹⁾ .
		8.1% in a cancer institute ⁽³³⁾ .	10.5% (year 1); 9.2% (year 2); and 10.5% (year 3) in ICU ⁽⁴⁰⁾ .
		1.39% (< 23 days of hospitalization) and 2.78% (> 23 days of hospitalization) in an ICU ⁽³⁰⁾ .	46.5% in ICU ⁽⁵⁰⁾ .
		9.33% in an ICU ⁽³⁵⁾ .	48.4% in clinical and surgical ICU patients ⁽⁴³⁾ .
			29.6% in a medical clinic unit ⁽⁴⁴⁾ .
		Minimum 11.8%; Maximum 35.7% (in 8 months evaluated) in medical clinic and ICU units ⁽⁴⁵⁾ .	
	Average of 9.2±6.3%, but non-compliance in 50% of the months analyzed in the ICU. ⁽⁴⁶⁾ .		
	5%		17.7% in ICU (n=17) ⁽⁴⁸⁾ .
			30.84% in ICU ⁽³⁶⁾ .
Frequency of inadvertent EN tube exits in patients on ENT.	<5% in ICU	0.13 (year 1) and 0.22 (year 2) ⁽²⁸⁾ .	44.1% ⁽⁵¹⁾ .
		0.18% (year 1); 0.14% (year 2); 0.22% (year 3); 0.13% (year 4) ⁽⁵¹⁾ .	
		0.0026% ⁽⁴²⁾ .	
		0.2% ⁽³⁹⁾ .	
		0.93% (month 1); 4.2% (month 2) and 2.56% (month 3) ⁽⁵⁰⁾ .	
		1.39% (< 23 days of hospitalization) and 2.78% (> 23 days of hospitalization) ⁽³⁰⁾ .	
		The indicator ranged from 4.2% to 31.3% in eight months of evaluation ⁽⁴⁵⁾ .	
		Average 3.9±2.2%, with inadequacy in 25% of the eight months analyzed ⁽⁴⁶⁾ .	
	<10% in wards	0.01% ⁽⁴⁷⁾ .	
		0.02% ⁽⁴⁹⁾ .	
1.2% ⁽⁴¹⁾ .			
1.5% ⁽⁴³⁾ .			

Frequency of days of adequate administration of the prescribed volume X infused volume in patients on NT.	>70%	84% (year 1) and 85% (year 2) in ICU ⁽³⁷⁾ .	65.5% in clinical units ⁽⁴¹⁾ .
	≥ 80%	83.4% in ICU trauma ⁽⁴⁸⁾ .	65.7% in ICUs and 69.5% in nursing stations ⁽³⁶⁾ .
		92.5% in a palliative care oncology unit ⁽⁴⁹⁾	71.5% of cancer patients in a public hospital ⁽³³⁾ .
		83.8% (year 1); 87.1% (year 2); and 87.1 (year 3) in ICU ⁽³⁹⁾ .	74.2% in a COVID ICU ⁽⁵²⁾ .
	>90%	86.5% in ICU trauma ⁽⁵³⁾ .	-
		Average of 94.3±3.3% adequacy in eight months of evaluation in ICU ⁽⁴⁶⁾ .	66.7% in a public hospital ⁽⁴⁷⁾ .
Frequency of nutrition tube obstruction in patients on ENT.	≤5% in wards	There were no cases in public hospitals ⁽⁴⁷⁾ .	-
		0.6% ⁽⁴¹⁾ .	
		2.2% ⁽⁴³⁾ .	
	≤10% in ICUs	There were no cases ⁽⁴²⁾ .	48.8% ⁽⁵⁰⁾ .
		0.64% (month 1); 0 (month 2); and 0.32% (month 3) ⁽³⁴⁾ .	
The average indicator was 0.8±1.5% over eight months ⁽⁴⁶⁾ .		-	
Frequency of constipation episodes in patients on ENT.	<10%	-	16.6% (< 23 days of hospitalization) and 19.4% in the ICU (> 23 days of hospitalization) ⁽³⁰⁾ .
	<20%	18.3% in a medical clinic ⁽⁴⁴⁾ .	Minimum: 18.8%; Maximum: 66.7% in eight months of evaluation in medical clinic and ICU units ⁽⁴⁵⁾ .
		-	55% (< 14 days of hospitalization) and 69.2% (> 14 days of hospitalization) in ICUs ⁽⁵¹⁾ .
		-	86.3% in an oncology palliative care unit ⁽⁴⁹⁾ .
			28.6% in a cancer institute ⁽³³⁾ .
		44.1% in an ICU ⁽⁵⁰⁾ .	
		29% in a clinical ward and ICU ⁽⁴³⁾ .	
Frequency of episodes of abdominal distension in patients on ENT.	< 15%	-	33.3% in an oncology palliative care unit ⁽⁴⁹⁾ .
		-	22.6% in medical/surgical wards and ICU ⁽⁴³⁾ .
Monitoring of EN	Spanish study. The indicator, although presented as the single one, has 15 components, making it difficult to compile the results. In 386 ICU patients assessed over 18 months, the established standard/correctly verified cases (100%) were achieved in the 'tube control', 'vomiting check', 'regurgitation' and 'bronchoaspiration' components. In the other components, which could be compared with the QINTs eligible for the scoping review, the percentages of compliance were: (a) daily control of the amount of diet administered: 99.4%; (b) daily assessment of abdominal distension: 77.2%; and (c) daily assessment of constipation: 81.8% (38).		

*The indicator evaluated is "Frequency of complications related to the Gastrointestinal Tract", which includes episodes of diarrhea, gastric stasis, or vomiting. TNE: Enteral Nutritional Therapy; ICU: Intensive Care Unit; NE: Enteral Nutrition; QINT: Quality Indicator for Nutritional Therapy.

DISCUSSION

This review gathered information on QINTs directly related to nursing practices in the care of hospitalized adult patients, identifying that most of the studies are national, published between 2018 and 2020, by nutrition professionals, and mostly carried out in ICUs. The QINT most described in the literature was “Frequency of diarrhea in patients on ENT”, and the one that showed the least adequacy to the goal was “Frequency of constipation episodes in patients on ENT”.

The prevalence of Brazilian studies can be justified by the choice of the types of QINTs adopted for the review ⁽¹⁰⁾, and by the current legislation on ENT in the country regarding the responsibilities assigned to the nursing team. Another result of our review was that nursing does not prioritize the topic of QINTs in its scientific publications, since of the 26 studies included in this review, two had nurses as authors. It so happens that, around ENT, specifically in EN, the nursing team has been the protagonist of research into Good Practices in Enteral Nutrition Administration (BPANE, in Portuguese). These practices focus on care about assertive techniques for positioning the tube ⁽⁵⁴⁾, safe administration of ENT ⁽⁸⁾, monitoring of complications ⁽⁵⁵⁾, and the nursing protocols for ENT ⁽⁸⁻⁹⁾.

Most of the studies that have investigated QINTs directly related to nursing practices have been carried out in ICUs, with adults in clinical, surgical and/or chronic conditions. This reality prompts us to reflect that some indicators can be better measured in closed care units, precisely because of the characteristics of the care provided by the nursing team in these environments, as well as the clinical profile of the patients ^(10,14). This may also justify the fact that some of the QINT are better demonstrated in the literature, because the condition assessed by the indicator (such as diarrhea, inadvertent tube outlet, difference in the volume of NE prescribed and infused) occurs more frequently in ICUs ⁽⁵⁶⁾.

It should be emphasized that each health institution can adopt the QINTs already suggested in the literature, as well as formulate those that best suit its reality and its care practices or protocols. Thus, the measurement of the indicators eligible for this review was described in the studies by different names/titles. Regarding the QINTs directly related to nursing practices, the most frequently described was “Frequency of diarrhea in patients on ENT”.

Diarrhea is one of the most frequent gastrointestinal complications in NE ^(3,57-59), which may justify the frequency with which this QINT has been investigated in the literature. Regarding the aspects that should be analyzed for the adequacy of this indicator, it must be understood that diarrhea is multi-causal ⁽⁵⁷⁻⁵⁹⁾ and should not be mistakenly associated with NET. In critically ill patients with Traumatic Brain Injury (TBI) using EN ⁽⁵⁷⁾, the incidence of diarrhea was high (n=23, 69.6%), and they had a longer ICU stay (p = 0.007). This study found that all patients who used combined prokinetic drugs (metoclopramide and erythromycin) and antibiotics for more than eight days had diarrhea (p = 0.057 and p = 0.007, respectively). In addition, conditions such as the use of some types of medication and their osmolarity are factors associated with diarrhea, as shown in a Dutch study ⁽⁵⁹⁾ with ICU patients using NE. In this investigation, the administration of hyperosmolar drugs was associated with an increased risk of diarrhea (OR 138.7 95% CI 2.33; 8245) in patients with NE by tube in the post-pyloric position.

It is therefore necessary for the team that cares for hospitalized adult patients using EN to have the means to correctly assess and identify this complication and whether, indeed, it is related to the use of ENT. A study ⁽⁶⁰⁾ carried out in the ICU of a Brazilian university hospital identified differences among health professionals, both in their knowledge and in their conduct, concerning diarrhea in patients receiving EN. For 29.7% of the nursing team, diarrhea was defined as “three or more episodes of liquid or semi-liquid bowel movements/day”; 51.3% “would inform the multi-professional team” when they came across a patient with diarrhea; and 51.3% identified the “presence of infection” and “diet” as causes of diarrhea.

A national guideline ⁽⁵⁸⁾ recommends that after the correct diagnosis of diarrhea, healthcare teams should consider all the risk factors present, including the medical prescription, and systematically evaluate patients to determine how to take action to eliminate the underlying causes, before unduly reducing or suspending EN. In this respect, nursing has been developing strategies to minimize adverse events due to the use of EN. A Korean study ⁽⁶¹⁾, conducted by nurses, implemented an EN protocol in a university hospital ICU, intending to improve practices and clinical outcomes for patients. The protocol consists of starting EN early (24–48 hours from admission) in hemodynamically stable patients, through continuous feeding; reducing the feeding rate, or using a motility agent (metoclopramide was used as a motility agent) if the Gastric Residual Volume (GRV) exceeds 200 milliliters; and nasojejunal feeding is recommended if the high GRV persists or if the risk of aspiration is high. Among the results of the study, 134 patients were evaluated before and 136 after implementation of the protocol (n=270), and EN was started earlier (35.8 vs 87.1 hours, p=0.001) and more patients received NE within 24 hours (59.6% vs 41.0%, p=0.002) and the incidence of diarrhea decreased significantly after implementation of the protocol (52.2% vs 21.3% p= <0.0001).

As for the secondary objective of this review, to measure the results of the QINT regarding adequacy with their respective targets, the “Frequency of inadvertent EN tube exits in patients on ENT” was the indicator that showed the best adequacy. However, the literature has already described high rates of this event, reaching 74.3% (n=273) in patients in clinical and surgical units at a hospital in southern Brazil ⁽⁶²⁾.

This indicator is considered relevant in clinical practice when the aim is to ensure that patients’ nutritional status is maintained or improved ⁽¹⁰⁾. It is also important to bear in mind that in this review, the adverse event “inadvertent EN tube exits” investigated as a QINT occurred frequently, but at low rates. This reality does not rule out the need to improve EN practices in the hospital environment, especially in ICUs, the environment in which the studies were most explored.

A national study ⁽⁵⁵⁾ carried out in a teaching hospital analyzed 448 incidents of inadvertent removal of a neonatal tube in adult patients admitted to open and closed units. The reasons that led to AE were removal of the tube by the patient (62.1% of occurrences) and tube obstruction (10%). The analysis revealed significant associations between the degree of damage and age (p=0.0254). Also, patients who suffered inadvertent tube exits with damage had more deaths (47.8%) as an outcome. Therefore, analyzing the results of this indicator is essential for nursing care, considering that maintaining patency, and securing and administering diets and medicines through the tube are responsibilities of the nursing team ⁽¹¹⁾.

In this scoping review, it was also identified that QINTs, which are less commonly investigated in the literature, have difficulties reaching their targets, as was the case with the indicator “Frequency of constipation episodes in patients on ENT”, in which of eight studies analyzed, one managed to reach its target. Constipation does not have a clear definition in the literature, with authors adopting the frequency of bowel movements of less than one in three days ⁽⁶³⁻⁶⁵⁾. Its incidence is high, depending on the hospital unit and the patient’s clinical condition, and in a general ICU with adult patients using EN, values between 50% (n=102) ⁽⁶⁴⁾ and 72% (n=43) ⁽⁶⁵⁾ have been identified. It is therefore important to analyze that adopting the same target for a given indicator for different hospital environments is inconsistent with the clinical specificities of the various hospitalized patients.

Constipation in adult hospitalized patients using EN does not have the visually alarming character of diarrhea and is therefore often not valued as it should be by the healthcare team ⁽⁵⁸⁾. This intestinal motility disorder is associated with pharmacotherapy, hydration, the nutritional state, and age of the patient ⁽⁶⁶⁾, conditions in which the nursing team assumes daily care responsibilities. Therefore, understanding, identifying, and acting on this complication are inherent to the nursing team, to contribute positively to the clinical and nutritional outcome of hospitalized patients. Studies

⁽⁶³⁻⁶⁵⁾ suggest that protocols with measures to control, prevent, and even treat this complication are of fundamental importance in clinical practice.

In the United States, a group of researchers ⁽⁶⁷⁾ developed a protocol to help the nursing team manage cases of constipation in critically ill patients using EN, to optimize the volume of EN prescribed and infused. In this protocol, initiatives such as the use of laxatives (Sene and Bisacodyl®) for patients who have not evacuated in the last 24 hours and the use of polymers (polyethylene glycol) are recommended, as well as personalized measures such as the use of prokinetics, reduction or elimination of narcotics or sedatives, rectal touch with fecaloma breakage and enema. Implementation of the constipation protocol was associated with significant improvements in NE volumes for 78% (68% at baseline).

Based on this scoping review, a gap was identified in studies of patients hospitalized in open care units, pointing to evidence that QINTs directly related to nursing practices are monitored less frequently in these units and under certain clinical conditions. Another gap refers to the information regarding the QINT, since the studies are mostly focused on analyzing the indicators crudely, few have explored the reasons that could explain such a result or even real possibilities for guaranteeing its goal.

The limitations of this study, despite the efforts to develop a comprehensive search strategy, include aspects related to the methodological procedures, such as the number of information sources selected and access to studies not available in full. The time frame adopted (from 2000 to 2023) appears to be an expressive period to cover publications on the subject, even though other countries have a longer trajectory and standardization of ENT and establishment of QINT. However, the article sets out to present the issue with a view to provoking attitudes in the Brazilian scenario. Previous publications in foreign settings, where ENT practices are substantially different from those published in Brazil, could add information, but they are no longer competitive even in the original settings. In addition, despite the advances in research in QINTs, there are still limitations due to the need for robust studies with a high level of evidence, such as randomized clinical trials, to assess the effectiveness of the indicators and the aspects related to their results. And, due to the methodology adopted in this review, some studies with similar subjects (for example prescribed vs. infused volume of EN and diarrhea in patients using EN) were not included, as they did not have the perspective of analyzing the condition of EN as an QINT.

The contribution of this review to the field of health, by summarizing the findings of publications on QINTs directly related to nursing practices, points to the real needs that hospitalized adult patients using EN present in clinical practice. This reality can support clinical care protocols, improvement measures in the hospital units with the highest demand for ENT - in the review, the ICU was identified as the most investigated unit - and continuing education actions for multidisciplinary teams, aimed at optimizing this therapy. In addition, this mapping provides an overview of adequate and inadequate QINTs in health institutions, enabling nurses to target the complications of EN and reduce costs, which are fundamental conditions for the success of ENT.

CONCLUSION

The study identified scientific publications on QINTs directly related to nursing practices in the care of hospitalized adult patients, summarizing those indicators that present inadequacies and inadequacies to the goals. The indicator “Frequency of diarrhea in patients on ENT” was the most investigated in the literature; and “Frequency of constipation episodes in patients on ENT” had the lowest adequacy to the goal. Although the QINTs directly related to nursing practices are frequently described in the literature, the nursing team does not play a leading role in the studies.

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