



Original/Otros

## Design of quality indicators for oral nutritional therapy

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### Abstract

**Objective:** quality indicators in nutritional therapy (NT) have been proposed as useful tools to improve clinical NT. This study was conducted to develop feasible quality indicators in oral nutritional therapy (QIONTs) to aid quality control.

**Methods:** a Clinical Nutrition Task Force composed of Brazilian NT experts from the International Life Science Institute (ILSI) developed QIONTs. In an internet-based psychometric survey, 40 independent Brazilian NT practitioners assessed four attributes (simplicity, utility, objectivity, and low cost) of each QIONT using a five-point Likert scale.

**Results:** independent NT experts consistently classified all 12 QIONTs developed by the ILSI team as good (mean Cronbach's alpha = 0.84). In ranked order, the QIONTs enable assessment of the frequency of nutritional screening, oral nutritional supplementation (ONS) prescription to malnourished patients receiving an oral diet, ONS prescription to patients receiving an oral diet but at risk of malnutrition, nutritional assessment, adherence to ONS regime, hospitalized patients with insufficient oral dietary intake and ONS prescription, ICU patients with insufficient oral dietary intake and ONS prescription, oral intake assessment in ICU patients, oral intake assessment in ward patients, oral supplement volume intolerance due to inappropriate offering time, ONS flavor intolerance, and ONS volume intolerance.

**Conclusion:** twelve potentially feasible new QIONTs were developed and approved for clinical practice by experts.

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Key words: *Quality indicator. Oral nutritional therapy. Expert opinion. Critical illness.*

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### DISEÑO DE INDICADORES DE CALIDAD PARA TERAPIA NUTRICIONAL ORAL

#### Resumen

**Objetivo:** los indicadores de calidad en la terapia nutricional han sido propuestos como herramientas útiles para mejorar la terapia nutricional (TN). Este estudio pretende diseñar indicadores de calidad de terapia nutricional oral (ICTNO) factibles en el control de calidad de TN oral.

**Métodos:** el diseño de ICTNO fue realizado por una comisión de nutrición clínica compuesta por brasileños expertos en TN del International Life Science Institute (ILSI). Más tarde, la aprobación de estos ICTNO fue valorada con análisis psicométricos recogiendo las opiniones de otros brasileños dedicados independientemente a la TN (n = 40) vía SurveyMonkey (encuesta por internet). Esta consistió en cuatro atributos valorando cada ICTNO (simplicidad, utilidad, objetividad y bajo precio) seguida de una escala Likert con cinco puntos.

**Resultados:** los expertos en TN de ILSI proporcionaron el diseño de 12 QIONT, que fueron todos consistentemente (Alfa de Cronbach = 0,84) clasificados como válidos por expertos independientes en NT. Por orden de relevancia, los nuevos ICTNO valoraron: la frecuencia de screening nutricional, la prescripción de suplementos de nutrición oral para pacientes desnutridos que ya reciben dieta oral, la prescripción de suplementos de nutrición oral para pacientes con bajo riesgo nutricional que ya reciben dieta oral, el consejo nutricional, la adhesión al suplemento nutricional oral, los pacientes hospitalizados con dieta oral insuficiente y prescripción de suplementos nutricionales orales, los pacientes de UCI con dieta oral insuficiente y prescripción de suplementos nutricionales orales, el consejo de nutrición oral en pacientes de UCI, el consejo de nutrición oral en pacientes en planta, la intolerancia al volumen de suplemento oral debido a dosificación inadecuada, la intolerancia al sabor del suplemento oral y la intolerancia al volumen de suplemento oral.

**Conclusión:** según la opinión experta, 12 potenciales y factibles nuevos ICTNO fueron diseñados y aprobados para la práctica clínica.

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Palabras clave: *Indicadores de calidad. Terapia nutricional oral. Opinión experta. Enfermedad crítica.*

## Introduction

Oral feeding should be the first-choice intervention for hospitalized eutrophic patients. When oral food intake meets only 60–80% of a patient's nutritional needs, however, oral nutritional supplementation (ONS) should be considered<sup>1</sup>. ONS is particularly relevant for patients who are losing weight or cannot ingest a sufficient amount of food 5–7 days after hospitalization, but it must be prescribed only to patients with adequate ability to swallow and no esophageal or gastric obstruction<sup>2</sup>.

ONS may provide complete nutritional requirements or, more often, supplement the oral diet when a patient is unwilling or unable to consume sufficient food to meet these requirements<sup>1</sup>. Although ONS has been shown to efficiently improve nutritional intake in older adults and patients with various health and eating-related problems, its acceptability and intake are suboptimal in many patients. A variety of factors, such as low appetite level or poor palatability, may interfere with ONS intake<sup>2,3</sup>.

Quality indicators in oral nutritional therapy (QIONTs) can be used to minimize or better control such variables. QIONTs are important tools for the evaluation of treatment and monitoring of its efficacy, as they enable the identification of possible difficulties and failures related to nutritional care protocols<sup>4,5</sup>. In this study, QIONTs were developed and assessed with the aim of improving the quality of ONT provided to hospitalized patients.

## Methods

This study was performed in two distinct phases.

### *Phase 1: Development of QIONTs*

QIONTs were developed during a meeting of the Clinical Nutrition Task Force, composed of Brazilian experts in NT. This task force is part of the Nutritional Committee of the International Life Science Institute (ILSI), a nonprofit science organization created to “improve public health and well-being by engaging academic, government, and industry scientists in a neutral forum to advance scientific understanding in the areas related to nutrition, food safety, risk assessment, and environment.” These specialists focused on designing feasible QIONTs that could improve compliance with the recommendations of available protocols and guidelines (European, American, and Canadian)<sup>6–8</sup> for the planning of ONT.

### *Phase 2: Assessment of QIONTs*

Psychometric analysis<sup>9</sup> was used to assess the QIONTs designed by the ILSI task force. The opinions of 40 independent Brazilian experts and NT practitioners were solicited using an internet-based Survey Monkey designed

specifically for this purpose. Respondents were asked to assess four attributes (simplicity, utility, objectivity, and low cost) of each QIONT using a five-point Likert scale (0 = very bad, 1 = bad, 2 = indifferent, 3 = good, 4 = very good)<sup>10</sup>. The final score for each QIONT was obtained by summing scores for the four attributes. Finally, averages values were calculated and each QIONT was classified according to mean attribute values that were up to 25%, 45%, 65%, 85%, and 100% of the total score (4.0) as very bad (0–1.05), bad (1.06–1.85), acceptable (1.86–2.65), good (2.66–3.45), or very good (3.46–4.0), respectively. The consistency and reliability of expert opinions for each indicator were assessed using Cronbach's alpha coefficient with values  $\geq 0.5$  considered to indicate good concordance<sup>11</sup>.

## Results

### *Phase 1: Development of QIONTs*

The NT specialists developed the following 12 QIONTs: frequency of (1) nutritional screening of hospitalized patients, (2) nutritional assessment of hospitalized patients, (3) oral intake assessment of ward patients, (4) oral intake assessment of intensive care unit (ICU) patients, (5) hospitalized patients with insufficient oral dietary intake and ONS prescription, (6) ONS prescription to patients consuming an oral diet but at risk of malnutrition, (7) ONS prescription to malnourished patients receiving an oral diet, (8) ICU patients with insufficient oral dietary intake and ONS prescription, (9) adherence to ONS regime, (10) ONS flavor intolerance, (11) ONS volume intolerance, and (12) ONS volume intolerance due inappropriate offering time.

### *Phase 2: Assessment of QIONTs*

Independent NT experts classified all 12 QIONTs as very good (first and second ranked QIONTs) or good (Table I). The experts' assessment of QIONT attributes was consistent (Cronbach's  $\alpha \geq 0.74$ ; mean = 0.84).

## Discussion

QIONTs may be useful tools for the monitoring of effectiveness of adherence to nutritional protocols and procedures. Effective QIONTs must be objective and easy to apply, and are preferably low cost to allow clinical use<sup>12</sup>. In this study, MT experts developed 12 QIONTs and 40 Brazilian specialist NT practitioners assessed their simplicity, utility, objectivity, and low cost.

The Likert scale was used for the assessment of QIONT attributes, to enable QIONT ranking and classification. This method is sensitive for the identifica-

**Table I**  
*Evaluation of oral nutritional supplementation quality indicators*

<i>Description</i>	<i>Average score</i>	<i>Mean score</i>	<i>Assessment</i>	<i>Cronbach's alpha</i>
Frequency of caring out nutrition screening of hospitalized patients	14.17	3.5	VG	0.78
Frequency of the prescription of oral nutrition supplements for malnourished patients receiving oral diet	13.92	3.48	VG	0.82
Frequency of the prescription of oral nutrition supplements for patients under nutritional risk receiving oral diet	13.80	3.45	G	0.82
Frequency of nutritional assessment in hospitalized patients	13.47	3.37	G	0.74
Frequency of oral nutrition supplement adhesion	13.45	3.37	G	0.80
Frequency of hospitalized patients with insufficient intake of oral diet and prescription of oral nutrition supplements	13.42	3.35	G	0.81
Frequency of ICU patients with insufficient intake of oral diet and prescription of oral nutrition supplements	13.32	3.33	G	0.86
Frequency of oral intake assessment in ICU patients	12.75	3.19	G	0.85
Frequency of oral intake assessment in ward patients	12.45	3.11	G	0.89
Frequency of oral supplement intolerance due inappropriate offering time	11.55	2.89	G	0.93
Frequency of oral supplement's flavor intolerance	11.53	2.88	G	0.84
Frequency of oral supplement's volume intolerance	11.50	2.87	G	0.91

Note: VG = very good; G = good.

tion of opposing ratings, gradients, and intermediate situations, with an adequate balance between the precision and accuracy of measurement<sup>10</sup>. Cronbach's alpha coefficient was used to assess the consistency and reliability of QIONT attribute scores obtained from psychometric tests<sup>11</sup>.

NT specialists considered all QIONTs developed in this study to be adequate; "frequency of nutritional screening of hospitalized patients" was ranked first among QIONTs. Over a 10-year period, the Brazilian National Survey of Nutrition<sup>13</sup> identified prevalent (48.1%) malnutrition among hospitalized patients, associated with high morbidity and mortality rates similar to those reported globally<sup>14,15</sup>. This situation may explain NT practitioners' consideration of nutritional screening and nutritional assessment (ranked fourth among QIONTs) to be main concerns. In a previous study involving the selection of the top 10 QIONTs for parenteral and enteral NT<sup>12</sup>, experts similarly ranked nutritional screening first and considered nutritional assessment to be important. The main advantage of nutritional screening over nutritional assessment may be the ability of screening to detect nutritional risk in patients with apparently adequate nutritional status<sup>16</sup>.

NT specialists also considered QIONTs related to ONS prescription to be relevant, ranking them second (for malnourished patients), third (for patients at risk of malnutrition), and fifth (adhesion to ONS regime)

among QIONTs. ONS may benefit malnourished patients, those receiving an oral diet but at risk of malnutrition, and eutrophic patients meeting <60% of their nutritional needs by oral intake<sup>17</sup>. However, lack of compliance with ONS intake has been reported worldwide<sup>18,19</sup>. Thus, QIONTs designed to monitor this nutritional variable may significantly impact patient outcomes.

ONS should be prescribed to any patient with inadequate oral food and fluid intake<sup>1,2</sup>. Several factors, such as dysphagia, neurological disturbance, and low appetite level, may reduce the oral dietary intake of hospitalized patients<sup>20</sup>. Assessment of the frequency of hospitalized and ICU patients with insufficient oral dietary intake and ONS prescription (ranked sixth and seventh, respectively, among QIONTs) can be used to correct oral ingestion, achieve nutritional needs, and avoid malnutrition and malnutrition-related complications<sup>2,3</sup>.

Determination of the frequency of oral intake assessment in ICU and ward patients (ranked eighth and ninth among QIONTs, respectively) were also chosen to compound QIONTs, probably because oral supplementation may negatively impact food intake. Fiatarone (1994) found no increase in total energy intake after 10 weeks in participants receiving ONS compared with control subjects. The authors stated that a high level of compliance with ONS was offset by a reduc-

tion in normal food intake. This intake reduction can negatively impact the effectiveness of NT, and these two QIONTs reflect a main concern regarding the control of food intake in different clinical settings<sup>21</sup>.

Several ONS-related variables may affect patients' tolerance of supplementation hampering the achievement of energy and nutrient targets. These variables include the period in which ONS is offered, the amount of ONS administered, and supplement flavor. To improve patients' tolerance and dietary intake, ONS should be provided between meals (not at meal times), be palatable (milky vanilla-, coffee-, and strawberry/raspberry-flavored supplements are well rated), and be concentrated in a small volume (providing only a short-term satiety effect)<sup>17,22,24</sup>. As the success of ONT is strongly dependent on patient tolerance<sup>17,24</sup>, NT specialists considered the assessment of intolerance frequency in relation to offering time, flavor, and volume (ranked tenth, eleventh, and twelfth among QIONTs, respectively) to be of value.

In conclusion, the QIONTs developed in this study can be used to assess the main factors relevant to ONT quality. Given the complexity of ONT, the proposed QIONTs are not meant to address all aspects that may interfere with the quality of this therapy. However, they allow NT practitioners to assess and control factors that can definitely impact the quality of ONT and are constant targets of guidelines, which may explain their consistently good evaluation by the experts consulted.

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## Declaration of Conflict of Interest

The authors thereby assigned affirm do not have any Conflict of Interest to declare.

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