

CONTENT VALIDATION BY JUDGMENT OF NUTRITIONAL SCALE EXPERTS FOR CRITICAL PATIENTS WITH ENTERAL NUTRITIONAL SUPPORT

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Abstract: A state of poor nutrition in critical patients causes greater mobility and mortality. For this reason, tools such as assessment scales must be available to guide decision-making when establishing nutritional support. The objective of this study was to create and validate, by expert judgment, a scale to assess the nutritional status of critically ill patients with enteral nutritional support. **Method:** to create the scale, a search was carried out in different databases of studies on practices and recommendations on nutrition in critically ill patients. Once the design was generated, it was subjected to validation through a rubric, by judgment of experts according to the Delphi technique, also determining Kendall's W coefficient. **Results:** once the rubric was evaluated by the experts, adjustments were made that were considered pertinent by the experts and six validation letters were obtained, which were issued by each of the experts and that support the appearance and content validity of the instrument. A satisfactory Kendall's K agreement coefficient was obtained for each of the criteria evaluated by the panel of experts, this meant that the items that were considered for the integration of the instrument were under an ideal degree of interjudge agreement. **Conclusion:** generating research instruments and assessment scales is an iterative procedure, it requires time and patience, but above all knowledge about the methodology to follow for its validation. Validating by expert judgment becomes relevant in situations where the information is not homogeneous or, when there is a shortage of it, nursing professionals dedicated to research must know this methodology and create valid instruments, promote the professional nature of nursing knowledge and create tools that serve the multidisciplinary team for decision making when establishing diagnoses and treatments.

Keywords: enteral nutrition, intensive care

unit, nursing, critical patient, malnutrition, validation study.

INTRODUCTION

In intensive care units, a state of poor nutrition is an independent factor of morbidity, it has been associated with an increased risk of infections, prolongation of invasive mechanical assistance for ventilation, longer hospital stay, increased costs, delayed wound healing and higher mortality rates.¹

A formal nutritional assessment provides guidelines to establish the nutritional care plan, monitor and evaluate the nutritional situation during the stay in the ICU.

Patients admitted to the intensive care unit are at imminent risk of malnutrition related to their pathophysiological state and the therapeutic methods used for treatment; in fact, the prevalence of malnutrition in these patients ranges between 30% and 70%.

The nursing professional is in charge of providing continuous care to critical patients. This situation gives them the possibility of collecting, among other information, clinical data on the patient's nutritional status and being able to work in collaboration with the members of the multidisciplinary team, providing continually monitor and assess the client's clinical situation, including tolerance and administration of nutritional support, route and devices of administration, and progress toward achieving the established objectives of nutritional therapy.

However, to date a consensus has not been reached to assess and monitor the nutritional status of critically ill patients, the lack of validated scales and protocols for this purpose and the insufficient knowledge about nutrition that has been detected by the health care team. health, made this research work possible.^{4,5}

The objective of this study is to design and validate a scale based on nursing diagnoses,

which serves to assess the nutritional status of patients admitted to intensive care units, making an analysis of the current literature, including studies that deal with factors associated with malnutrition, guidelines published by internationally recognized associations such as the American Association of Enteral and Parenteral Nutrition (ASPEN), the European Society of Parenteral and Enteral Nutrition (ESPEN) and the Spanish Society of Critical Intensive Care Medicine and Coronary Units (SEMICYUC), which have established recommendations on nutrition in critically ill patients, and thus lay the foundations that justify each of the diagnoses considered to integrate the scale to be validated.

A quantitative, non-experimental, cross-sectional and descriptive study was carried out. The validation process was carried out in three stages; 1) Review of the literature for the creation of the scale; 2) Invitation to experts and formation of the panel that validated the content of the scale; Delphi technique and 3) Adjustments derived from validation by experts, Kendall's W coefficient and obtaining a validation letter.

METHODS

A quantitative, non-experimental, descriptive study was carried out to create and validate the aspect and content of an instrument for nutritional nursing assessment in critically ill adults with enteral nutritional support.

GOAL

Create and validate by expert judgment a scale based on nursing diagnoses, which evaluates the nutritional status of critically ill patients fed enterally.

INSTRUMENT

The criteria evaluation rubric⁶ was used, which evaluates; sufficiency, clarity, coherence,

importance and relevance, being able to assign the following values to each of the items that made up the original version of the scale:

1. Does not meet the criteria.
2. Low level.
3. Moderate level.
4. High level.

PROCEDURE.

The design and validation of the scale was carried out in three stages:

1. Review of the literature for the design and foundation of the instrument

To create the instrument, a search was carried out in databases such as PubMed, ScienceDirect, Scielo, Google Scholar and the Google search engine, for information and research related to enteral nutritional support in critically ill patients; recommendations issued by the Association were considered. American Institute of Enteral and Parenteral Nutrition (ASPEN), research groups and studies that show predictive factors of malnutrition.

Different diagnoses published in NANDA 2021-2022⁷ were included and only those that were considered to be related to the recommendations of guidelines published by research groups such as the American Association of Enteral and Parenteral Nutrition (APEN), Metabolism and Nutrition Working Group were selected. of the Spanish Society of Intensive Care Medicine and Coronary Units (SEMICYUC)⁸, which establish recommendations and points of good practice for patients receiving enteral nutritional support.

The initial design of the scale is based on seven nursing diagnoses; two risk diagnoses, and five problem-focused diagnoses. The nursing diagnoses published by NANDA already comply with a validation process, therefore, when analyzed, those that are

related to the nutritional status of the patient were integrated, such as; data on gastrointestinal intolerance, assessment of skin condition, presence of pressure injuries, loss of muscle tissue, inadequate food supply and risk of infection. Four additional factors that in various studies have been associated with malnutrition in critically ill patients were also considered; body mass index, patient age, support with invasive mechanical ventilation and the number of days of hospital stay.

2. Invitation to experts and formation of the panel that validated the content of the scale; Delphi technique

The Delphi method was used to integrate a panel of six experts who evaluated five characteristics of the instrument; sufficiency, clarity, coherence, importance and relevance on a scale from 1, does not meet the criteria and up to 4, high level.

To integrate the panel, it was considered that they were nursing professionals, who had postgraduate studies, experience in the area of intensive care and research.

A guide was created that defines the objective and how to properly apply the scale “Nutritional evaluation scale for critically ill patients with enteral nutritional support” which was sent to the members of the panel of experts who were invited and accepted as part of the process. validation.

3. Adjustments derived from validation by experts, Kendall's W coefficient and obtaining a validation letter

Communication with some of the members of the expert panel was only via email and as the experts responded, adjustments and modifications were made that were suggested, and there was also the need to justify and defend (with studies). and investigations) as to why some items would be retained.

Once the six rubrics were available,

the average of the scores given for each characteristic of the items was calculated and decisions were made on whether or not to maintain certain items, as well as add some others, change design, structure, syntax and semantics.

To give greater reliability to the judgment issued by the experts, it was decided to determine the agreement coefficient by Kendall's W, submitting the data obtained in the rubrics to the SPSS 21 software.

BIOETHICAL ASPECTS OF RESEARCH

This study is based on the Declaration of Helsinki, on the General Health Law in article 100 and on the Regulations of the General Health Law on Research for Health in its second title, article 13, which speaks of respect for human dignity and protection, article 14 in accordance with scientific and ethical principles that justify the research.

RESULTS

PHASE I CREATION OF THE SCALE

After the exhaustive search of the literature, an assessment instrument was created that was organized according to the following components (Table 1).

PHASE II. FORMATION OF THE PANEL OF EXPERTS; DELPHI TECHNIQUE

From the characteristics of the experts who participated in the validation of the aspect and content of the instrument

The panel of experts was made up of five nursing professionals, four of them national and one international (Canada) and a graduate in nutrition. The criteria considered for the selection of the experts were; academic career, professional experience in the care of critically ill patients, being active in intensive or intermediate therapy service as operational

WEIGHT:

SIZE:

BM:

(18.5 > 25 1point.)

Days of stay: (≥ 5 - 9 day + 1 point. ≥ 10 days 2 points.)

Age.

(50 YEARS 0 points. 50 - 75 YEARS. 1 POINT. > 75 YEARS 2 PST.)VMI

(2

POINT.)

VARIABLE.	DIAGNOSIS	FEATURES	PRESENT	
BIOCHEMISTRY.	Risk of unstable blood glucose level. 00179	· Capillary blood glucose less than 110 mg/dl or greater than 180 mg/dl.	1 POINT.	0 points.
PHYSICAL EXAM.	Dysfunctional gastrointestinal motility. 00196.	· • Distended abdomen. · • Diarrhea. (5 or more bowel movements in or at least 2 bowel movements of 1000 ml in 24 hours) · • Greater gastric residue. (Greater than 500ml) · • Difficulty with defecation. (No presence of evacuations in 3 days of starting the diet or 7 days from admission.) · Regurgitation.	One or more characteristics is qualified with: 2 points.	0 points.
	Unbalanced nutrition: less than the body's requirements. 00002	· Inadequate food supply.	2 points.	0 points.
	Risk of infection. 00004	· Fiebre. (Temperatura mayor a 38.3 ° C) · Procedimiento invasivo. (VMI, CVC, SNG, heridas, etc.)	1 POINT.	0 points.
	Pressure injury in adults. 00312	· • Erythema. (.5pts.) · • Partial thickness loss of the dermis. (.5pts.) · • Full thickness tissue loss. (.5pts.) · BRADEN score LESS THAN 14PTS. (.5pts.)	2 points	0 points.
	Impaired skin integrity. 0046	· • Altered skin color. (.5pts.) · • Altered turgor. (.5pts.) · • Dry Skin. (.5pts.) · Peeling. (.5pts.)	2 points	0 points.
	Risk of deterioration of tissue integrity. 00248	· • Decrease in physical activity. · Impaired physical mobility.	1 POINT.	0 points.
		PUNTUACIÓN TOTAL.		

Table 1: Nursing nutritional evaluation scale for critically ill patients

Source: own elaboration, 2021.

Score.	Explanation
0 – 6 points.	Low risk of developing malnutrition.
7 – 12 points.	Moderate risk of developing malnutrition.
Equal or greater than 13 points.	High risk of developing malnutrition.

staff in a health institution, having basic knowledge in nutrition and nursing care for patients with enteral nutrition, having experience in the application of the nursing care process.

Two judges have postgraduate studies in the specialty of critically ill adults, two more have a master's degree and one has a doctorate degree. A nutritionist with more than 5 years of experience in clinical nutrition also participated.

FASE III. AJUSTES AL INSTRUMENTO, COEFICIENTE W DE KENDALL Y OBTENCIÓN DE CARTA DE VALIDACIÓN

Communication with some of the members of the expert panel was only via email and as the experts responded, adjustments and modifications were made that were suggested, and there was also the need to justify and defend (with studies). and investigations) as to why some items would be retained. During this process there was a need to send corrections on more than two occasions.

The Kendall W coefficient was calculated to determine the degree of agreement between the responses of the six panel members. A significance of less than 0.05 was obtained in all categories, which indicates that there is significant agreement in the responses issued by the judges. Likewise, the agreement coefficient is acceptable, since it tends more towards 1 (table 1).

Below is the table with the averages of the evaluation of the five characteristics evaluated by the members of the expert panel; these results served to give structure and adequacy to the items (table 2).

To obtain the validation letter, adjustments had to be made to the scale, such as the elimination and integration of some items. Below, the changes made to the scale are presented, which were made considering the

results contained in Table 1. and 2.

DELETED ITEMS

- “Capillary blood glucose less than 110 mg/dl or greater than 180 mg/dl” It was decided to be eliminated from the scale because no sufficient relationship was found to assess the nutritional status of the patient in critical condition.
- “Increase in gastric residue. (Greater than 500ml)”⁴
- “Erythema”, “Braden score less than 14pts.”, “Desquamation” and “Impaired physical mobility.” It was considered to eliminate these items due to the weak evidence, the duplicity of what is intended to be measured, and that in other items it was already considered.⁷

ITEMS THAT WERE INTEGRATED

- “Use of norepinephrine at 3 mcg/kg/min” This item was added due to the various studies that talk about hemodynamic instability and the initiation of enteral nutrition.⁹
- “Fasting equal to or greater than 48 hours. after admission to the ICU.” The start of early nutrition within the first 24-48 hours is recommended in different studies.⁴

Adjustments were made to the structure and design of the scale, the scores that were being given in each of the items were also adjusted, decimal values were eliminated, the minimum score in this version remains 0 and the maximum 24.

These adjustments were made with the intention of making its application easier, and some words were also modified to make it easier to interpret and understand. At the end of the modifications, they were reduced from 11 items to 10.

The validation letters from each of the experts who made up the panel were

Criterion	Asymptotic significance (<0.05 There is significant agreement)	Kendall's W coefficient
Sufficiency	.003	.95
Clarity	.000	.61
Coherence	.000	.67
Importance	.000	.66
Relevance	.000	.73

Table 1: Kendall's W coefficient and statistical significance of the characteristics of the original instrument.

Source: Results of the application of the evaluation rubric to which the instrument "Nutritional assessment scale for critically ill patients with nutritional support" was subjected.

Items	Sufficiency	Claridad	Coherence	Importancia	Relevance	Observations and suggestions issued by the experts
Capillary blood glucose less than 110 mg/dl or greater than 180 mg /dl.	1.5	2.5	2.5	2.6	2.3	I don't see why lower blood glucose could be the cause of the patient's malnutrition, perhaps it is the consequence of.
Distended abdomen.	4	4	4	4	4	
Diarrhea. (5 or more bowel movements in or at least 2 bowel movements of 1000 ml in 24 hours)		4	4	4	4	
Greater gastric residue. (Greater than 500ml)		3.5	3.6	3.6	3.6	In recent guidelines, gastric residue is no longer routinely measured in critically ill patients. We could know about gastric residue only if the patient presents vomiting or regurgitation.
Difficulty with defecation. (No presence of evacuations in 3 days of starting the diet or 7 days from admission.)		3.8	4	4	4	
Regurgitation.		3.6	4	4	4	
Inadequate food supply.		3.8	4	4	4	As long as you know the calculation of the patient's total calories in 24 hours
Fever. (Temperature greater than 38.3 ° C)		3.1	3.3	3.5	3.5	It is not clear to me why invasive procedures could be the cause of the patient's lack of nutritional intake, unless it is specified that an enteral tube cannot be installed in the patient due to some gastrointestinal surgery.
Suspected infectious focus; invasive procedure. (VMI, CVC, SNG, wounds, etc.)		3.3	3.5	3.5	3.5	
Erythema.		1.5	1.3	1.3	1.3	This entire block of pressure injury is the consequence of poor nutrition, but not a risk predictor for developing malnutrition.
Partial loss of the thickness of the dermis.		2	1.6	1.5	1.5	
Full thickness tissue loss.		2.1	2.3	2.3	2.3	On the contrary, I would say that if you have a pressure injury you must be better fed to help repetition.
BRADEN score LESS THAN 14 points		1.1	1.3	1.3	1.1	
Altered skin color.		3.1	3.1	3	1	The question I would ask myself would be.
Altered turgor.		3.3	3.1	3	3	why dry skin determines
Dry skin	3.3	3.1	3	3	the degree of risk of developing malnutrition in the ICU? I take what is highlighted in red from the scale objective	
Peeling.	3.3	3.1	3	3		
Decreased physical activity.	3.3	3.3	3.3	3.5	I continue to see more items with the cause of poor diet	
Impaired physical mobility.	3.3	3.5	3.5	3.5	than the risk of predicting it.	

BMI	4	3.8	3.8	3.8	3.8
Age		4	4	4	4
Days of hospital stay.		4	4	4	4
VMI		3.6	3.6	3.6	3.6

Table 2: Average score issued by panel of experts

Source: Results of the application of the evaluation rubric to which the instrument “Nutritional assessment scale for critically ill patients with nutritional support” was subjected.

Variable	Value		Score
<ul style="list-style-type: none"> Distended abdomen. Diarrhea. (5 or more bowel movements in or at least 2 bowel movements of 1000 ml in 24 hours) Regurgitation. Difficulty with defecation. (No presence of evacuations in 3 days of starting the diet or 7 days from admission.) 	3 POINTS. (At least one sign present)	4 POINTS. (More than one sign present)	
Intermittency due to procedures or decreased infusion rate. (Imaging studies, surgical procedures, mobilization, etc.)	2POINTS.	3 POINTS. (Fasting equal to or greater than 48 hours. after or during admission to the ICU.)	
Suspected infectious focus associated with invasive devices, wounds, drains, stomas, underlying pathology, IAAS, Fever. (Temperature greater than 38.3 ° C), etc”	NO CULTIVATION 1POINT.	WITH CULTIVATION 2 POINTS.	
Full thickness tissue loss. (Surgical wounds, grade II pressure injuries, etc.) Or at least 2 of the following signs on the skin: <ul style="list-style-type: none"> Altered turgor. Dry, flaky skin. Partial thickness loss of the dermis (Pressure Injury I). 	1 POINT.		
Decreased physical activity. (Stay in ICU longer than 5 days)	2POINTS.		
BMI _____ . Size weight: _____	Less than 18.5 or Greater than 251pt.		
Age in years.	50-70a 2 POINT.	Over 70 years old. 3POINTS.	
Days of hospital stay.	5-9 days 2 POINT.	Greater than 10 days 3 POINTS.	
Extension of invasive mechanical ventilation.	1-4 days 2 POINTS.	Equal or greater than 5 days 3 POINTS.	
Hemodynamic instability; use of norepinephrine at 0.3 mcg/kg/min.	2.		
	Total.		

Score	Explanation
0 – 8 Points	Low risk of developing malnutrition.
9 – 16 Points	Moderate risk of developing malnutrition.
Equal or greater than 17 points and up to 24 points	High risk of developing malnutrition.

Table 2: Nursing nutritional evaluation scale in critically ill patients with enteral nutritional support 1.1.

Source: own elaboration, 2022.

integrated, with which the content validity of the scale is obtained (Table 2).

DISCUSSION

Luján-Tangarife y Cardona-Arias¹⁰ mention that in health sciences it is essential to have tools and scales available that help assess the health status of patients, that facilitate the integration of information and subjective data that cannot be measured directly, this with the intention of guiding decision making in clinical practice, treatments and interventions. In accordance with this statement, the “Nutritional assessment scale for critically ill patients with enteral nutritional support” was designed and validated since, for the assessment of the nutritional status of patients in critical condition, there is no scale based on scientific evidence that establishes a method of assessment. nutritional assessment during the stay in Intensive Care Units.⁴

Malnutrition causes an increased risk of morbidity and mortality, alters the function of the immune system, exposes the patient to a greater risk of suffering from infections, and slows healing and tissue repair...prolonging hospital stay and increasing hospitalization costs¹¹, due to the deleterious effects that a state of malnutrition brings with it, this scale was created and validated, since, as the authors mention, a state of malnutrition implies greater morbidity and mortality for patients admitted to the ICU.

Zamora³ mentions that given the variability that exists in the literature, it is important to have scales that adequately evaluate the nutritional status of the critical patient, taking into account this, it was decided to create and validate a scale that assesses the nutritional status of the critical patient with enteral nutritional support.

For the design and apparent validation of the “Nutritional evaluation scale for critically ill patients with enteral nutritional

support”, the methodology of an expert panel using the Delphi technique was considered, because, being an unpublished instrument, it must be based on the judgment of professionals who have experience on the subject of the instrument, this agrees with the recommendations issued by Luján-Tangarife & Cardona-Arias¹⁰, where they specify the importance of expert judgment or criteria in the initial stage of the construction and validation of health scales.

Escobar-Pérez & Cuervo-Martínez¹² define that, to estimate the reliability of an expert judgment, it is necessary to know the degree of agreement between them, since a judgment includes subjective elements. For this reason, Kendall's W coefficient was calculated, giving a positive result in this research, according to the parameters established by these authors.

CONCLUSIONS

In this research work, a scale for evaluating the risk of malnutrition in critically ill patients with enteral nutritional support was designed and validated by a panel of experts.

The most important thing for the design of this scale was the scientific support that each of the items has, since in addition to being based on nursing diagnoses established and validated in the latest version of NANDA-I 2021-20237, each item They are supported by the most current scientific evidence, as well as recommendations established by various studies, research groups and international associations (ASPEN, ESPEN, SEMICYUC, etc.) focused on nutritional support therapy.

Likewise, the apparent validation using the Delphi technique enriched the structure of the scale, having the opinion and feedback of nursing professionals who work as specialists in intensive care units and the contributions of a professional with experience and training in clinical nutrition. They made apparent validity possible so that it could be applied

based on the recommendations of a group of experts on the central topic of the research, issuing a validation letter for each member of the panel.

Designing and validating research instruments and health assessment scales promotes advanced nursing practice and evidence-based care. For this reason, nursing professionals who carry out research will have to know and apply the appropriate methodology for the creation and validation of these tools, generate new knowledge and promote the scientific nature of the profession.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest.

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