



Original

Nutritional screening in clinical patients at a University Hospital in Northeastern Brazil

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Abstract

Objectives: According to the Brazilian Hospital Nutritional Assessment Inquiry, malnutrition in hospitals reaches 48.1% in Brazil, with this figure reaching as high as 63.9% in the northern and northeastern regions of the country. Despite its high prevalence, hospital malnutrition is not well identified by the majority of professionals on healthcare teams. The aim of the present study was to identify nutritional risk in patients hospitalized for clinical conditions.

Method: This study was conducted at a university hospital in northeastern Brazil. Data were collected using the NRS 2002 screening tool (score ≥ 3 for nutritional risk) within 48 hours after admission to hospital.

Results: Ninety-nine patients (44.4% men and 55.6% women; 58.6% elderly individuals and 41.4%) were studied between April and October 2010. Nutritional risk was identified in 39.4% upon admission to hospital. Reduced food intake and body mass index were associated with nutritional risk.

Conclusions: A high percentage of clinical patients were at nutritional risk, which corroborates findings described in the literature. Low food intake was associated with nutritional risk. These results underscore the importance of nutritional care upon admission to hospital, which can contribute to improving or maintaining nutritional status and the avoidance of complications throughout the hospitalization period.

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Key words: Nutritional risk. Malnutrition. Nutritional risk screening. NRS 2002. Nutritional screening.

EVALUACIÓN NUTRICIONAL EN PACIENTES CLÍNICOS EN UN HOSPITAL UNIVERSITARIO EN EL NORESTE DE BRASIL

Resumen

Objetivos: De acuerdo con la Encuesta de Evaluación Nutricional del Hospital de Brasil, la desnutrición en los hospitales alcanza el 48,1% en Brasil, esta cifra alcanza hasta el 63,9% en las regiones del norte y noreste del país. A pesar de su elevada prevalencia, la desnutrición hospitalaria no está bien identificada por la mayoría de los profesionales en los equipos de salud. El objetivo del presente estudio fue identificar el riesgo nutricional en pacientes hospitalizados por cuadros clínicos.

Método: El estudio se llevó a cabo en un hospital universitario en el noreste de Brasil. Los datos fueron recolectados a través de la herramienta de detección NRS 2002 (puntuación ≥ 3 para riesgo nutricional) dentro de las 48 horas después del ingreso al hospital.

Resultados: Noventa y nueve pacientes (44,4% los hombres y las mujeres 55,6%, 58,6% personas de edad avanzada y 41,4%) fueron estudiados entre abril y octubre de 2010. El riesgo nutricional fue identificado en 39,4% al momento del ingreso al hospital. Reducción de la ingesta de alimentos y el índice de masa corporal se asoció con riesgo nutricional.

Conclusiones: Un alto porcentaje de pacientes clínicos estaban en riesgo nutricional, lo que corrobora los hallazgos descritos en la literatura. Baja ingesta de alimentos se asoció con riesgo nutricional. Estos resultados subrayan la importancia de la atención nutricional al ingreso en el hospital, que puede contribuir a mejorar o mantener el estado nutricional y la prevención de complicaciones durante el período de hospitalización.

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Palabras clave: Riesgo nutricional. Desnutrición. Detección de riesgo nutricional NRS 2002. Cribado nutricional.

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Introduction

Although not well identified by professionals on healthcare teams, malnutrition is highly prevalent in hospitals.¹ According to Ferreira and França, malnutrition affects 15 to 20% of hospitalized patients in developed countries.² The following are among the problems that contribute to hospital malnutrition: a lack of nutritional screening upon admission; highly restrictive non-supplemented diets for long periods; meals not served due to interference by medical procedures and clinical tests; and a non-monitored lack of appetite in patients.^{3,4}

The American Dietetic Association (ADA), Joint Commission on Accreditation of Healthcare Organizations and the Nutritional Screening Initiative define nutritional screening as the identification of characteristics associated with dietary or nutritional problems.⁶ Nutritional screening consists of a simple inquiry directed at the patient or family members with the aim of determining nutritional risk, changes in the health condition that affect nutritional status and factors that can lead to nutrition-related problems.^{6,7} The European Society for Parenteral and Enteral Nutrition (2002) recommends the use of two screening tools for the adult population in Europe: the Malnutrition Universal Screening Tool and Nutritional Risk Screening 2002 (NRS 2002).⁸

There is a need to administer nutritional screening in hospitalized patients to optimize early nutritional care. Thus, the aim of the present study was to identify nutritional risk in patients hospitalized for clinical conditions.

Materials and methods

Study design and patients

This study was conducted at the hospital of the *Universidade Federal de Pernambuco* (UFPE, Brazil), involving 99 male and female adult and elderly patients interned in the medical clinic infirmary between April and October 2010. The study received approval from the UFPE Human Research Ethics Committee and all participants signed a statement of informed consent. The minimum age for inclusion in the study was 16 years. Patients with terminal diseases under palliative treatment, those unable to answer the questionnaire or had no caregiver available to answer the questionnaire, those having been hospitalized in the previous six months and those who refused to participate were excluded from the study.

Assessment methods

Data were collected using a chart with information on patient name, age, weight, height, body mass index

(BMI), weight loss and food intake in the week prior to admission. This chart was filled out only by the researcher within 48 hours after admission to hospital. The information from this chart was used to fill out the NRS 2002, which is composed of questions on BMI, unintentional weight loss in the previous three months, appetite, food intake and absorption and stress stemming from illness. In this type of screening, age over 70 years is considered an important additional risk factor. Nutritional risk was defined by a cutoff point of ≥ 3 .⁸

Weight and height were determined using a Filizola® scale (capacity: 150 kg) and stadiometer. These data were used to determine the BMI, with nutritional status determined based on Lipchitz (1994)⁹ for elderly individuals and the World Health Organization (2000)¹⁰ for adults. Adjustments were made for patients with swelling in the upper and/or lower limbs, ascitis and/or anasarca based on Rosa et al. (2008).¹¹

Statistical analysis

The Excel 2003 program was used for the construction of the databank. The statistical analysis was performed using the Statistical Package for Social Sciences, version 13.0 for Windows (SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was used to determine the normality of the distribution of the continuous variables. The results are presented in tables with respective absolute and relative frequencies. Either the chi-squared test or Fisher's exact test were used, when appropriate, to determine statistically significant associations, with the level of significance set to 5% ($p < 0.05$).

Results

Ninety-nine patients were included in the present study. Mean age was 53.91 ± 19 years (range: 17 to 90 years); mean weight was 58.07 ± 15 kg and mean BMI was 22.77 ± 5.3 kg/m². Table I displays the characteristics of the sample regarding gender, age, base disease, weight loss and nutritional status. The highest percentage of risk was found in patients diagnosed with neoplasm (38.4%), followed by patients with conditions classified as "others" (conditions with a low incidence in the infirmary throughout the study period). Upon admission to hospital, 39.4% ($n = 39$) of the patients were at nutritional risk.

Table II displays the association between nutritional risk and the variables addressed on the NRS 2002. Reduced food intake ($p < 0.001$), reduced BMI ($p = 0.004$) and unintentional weight loss ($p = 0.01$) were significantly associated with nutritional risk. Age, gender and base disease were not associated with nutritional risk. Figure 1 displays the distribution by age. Nutritional risk was detected in 19 adult patients (48.7%) and 20 (51.3%) elderly patients.

Table I
Characterization of sample according to gender, age, base disease, food intake, weight loss and nutritional status

Variables	n	%
Gender		
Male	44	44.4
Female	55	55.6
Age (years)		
< 60	58	58.6
≥ 60	41	41.4
Base disease		
Kidney disease	7	7.1
Infectious disease	7	7.1
Rheumatic disease	8	8.1
Heart disease	8	8.1
Lung disease	12	12.1
Liver disease	14	14.1
Others*	20	20.2
Neoplasm	23	23.2
Food intake		
0-25%	9	9.1
26-50%	22	22.2
51-75%	26	26.3
76-100%	42	42.4
Weight loss		
Present	60	60.6
Absent	26	26.3
Unknown	13	13.1
Nutritional risk		
Present	39	39.4
Absent	60	60.6
BMI		
Underweight	30	30.3
Ideal weight range	43	43.4
Overweight/obese	26	26.3

*Hereditary, gastric, neurologic, endocrine diseases and other less frequent conditions.

Discussion

Based on the results of the internationally validated NRS 2002 screening tool, 39.4% of clinical patients at the UFPE hospital were at nutritional risk. Underweight, reduced food intake and unintentional weight loss were significantly associated with this risk. These findings underscore the importance of establishing nutritional screening as a routine in Brazilian hospitals, as the country does not yet employ a single validated method that can contribute toward the prevention of hospital malnutrition.

The present study allows an understanding of the nutritional status of patients upon admission to university hospitals in northeastern Brazil. There are few studies in the country addressing the detection of nutritional risk upon admission to hospital. In contrast, a

number of centers in other countries have performed this type of analysis. Data from the literature demonstrate variable degrees of malnutrition upon admission to hospital, with the frequency ranging from 10 to 67.4%.^{12,13,14} According to Beghetto (2008), the Subjective Global Assessment is not the best predictor for the determination of hospital malnutrition or nutritional risk.¹⁵ A trial conducted at the hospital of the *Universidade de São Paulo* involving the assessment of malnutrition using the Subjective Global Assessment reports a 7.5% frequency of moderate malnutrition among clinical patients.¹⁶ A study carried out in Portugal reports a 58.4% frequency of malnutrition among clinical patients using the BMI, arm muscle circumference and triceps skinfold as the assessment parameters.¹⁷ In the present study, the BMI classification revealed a 30.3% frequency of malnutrition. This difference likely occurred due to the limitation of the BMI when used alone in comparison to other methods employed for the diagnostic criteria of nutritional status.

Exclusively analyzing surgery patients, a number of studies have screened for malnutrition using different methods (Subjective Global Assessment, Nutritional Risk Index) and report different percentages (10-67.4%, 58.3%, respectively).^{18,19} These figures are higher than those found in the present study (hospital malnutrition: 30.3%; nutritional risk: 39.4%).

There are few studies on the detection of nutritional risk that offer data for the purposes of comparison. Screening for nutritional risk in elderly individuals with a mean age of 82.1 years in the United Kingdom, Sarah et al. (2008)¹⁸ found that different methodologies revealed different risk percentages, with 10.43% determined to be at risk using the Malnutrition Universal Screening Tool and 6.69% at risk using the Birmingham Nutrition Risk score. Moreover, the authors found that 17.39% were at risk when using both methods and concluded that the Malnutrition Universal Screening Tool is specific for predicting mortality among elderly individuals, which was not true for the Birmingham Nutrition Risk score or BMI. In the present study, a 48.78% frequency of nutritional risk was found among elderly individuals (≥ 60 years), which may be explained by difficulties regarding access to health care and the precarious socioeconomic status of the population studied.

A study carried out in Austria involving elderly individuals (≥ 65 years) found a 28% frequency of nutritional risk using the Short Form of the Mini Nutritional Assessment, with malnutrition associated with depression, hematocrit, fasting blood glucose and daily activities.¹⁹ The authors concluded that the individuals had an increased risk due to the effect of preexisting conditions that are common in this age group, along with physical dependence, resulting in inadequate food intake. In comparison, the present study found a higher frequency of nutritional risk among elderly individuals (48.78%).

Studies involving the NRS 2002 for the detection of nutritional risk report frequencies greater than 30%

Table II
Association between nutritional risk, nutritional assessment variables and base disease

Variables	Nutritional risk				p-value
	Present		Absent		
	n	%	n	%	
Gender					
Male	20	51.3	24	40.0	0.370*
Female	19	48.7	36	60.0	
Age (years)					
< 60	19	48.7	39	65.0	0.162*
≥ 60	20	51.3	21	35.0	
Base disease					
Heart disease	3	7.7	5	8.3	0.054**
Lung disease	5	12.8	7	11.7	
Kidney disease	3	7.7	4	6.7	
Liver disease	4	10.3	10	16.7	
Rheumatic disease	0	0.0	8	13.3	
Infectious disease	3	7.7	4	6.7	
Neoplasm	15	38.4	8	13.3	
Others	6	15.4	14	23.3	
Food intake					
0-25%	9	23.1	0	0.0	< 0.001*
26-50%	14	35.9	8	13.3	
51-75%	10	25.6	16	26.7	
76-100%	6	15.4	36	60.0	
Weight loss					
Present	31	86.1	29	58.0	0.010*
Absent	5	13.9	21	42.0	
BMI					
Underweight	19	45.2	11	19.3	0.004*
Ideal weight range	18	42.9	25	43.9	
Overweight/obesity	5	11.9	21	36.8	

*Chi-squared test.

**Fisher's exact test.

among hospitalized patients,^{17,20,21} which is in agreement with the percentage in the present study. In contrast, a study carried out in Denmark²² and a publication from the European continent²³ report somewhat lower percentages of nutritional risk (20% and 27%, respectively). A cohort study carried out for the validation of the NRS 2002 as a nutritional screening tool in Turkey found a 15% frequency of nutritional risk.¹² A study carried out at five public hospitals in Portugal reports a 64.1% frequency of clinical patients at nutritional risk,¹⁷ which is much higher than the figure found in the present study. Such divergences may be attributed to differences in population characteristics, socioeconomic status, sample size and age. The higher percentage of individuals at risk in northeastern Brazil likely occurs due to difficulties regarding access to healthcare services as well as a lack of awareness on the part of professionals on healthcare teams regarding the importance of determining nutritional status upon admission to the clinical evolution of patients.

In the present study, no statistically significant associations were found between nutritional risk and

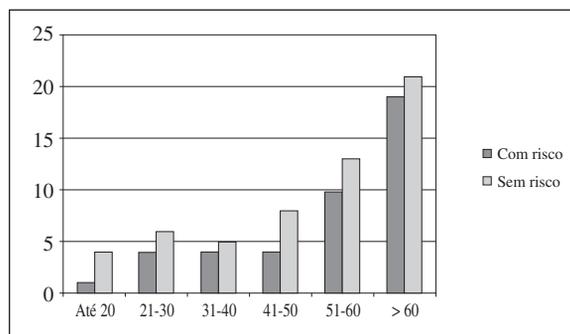


Fig. 1.—Distribution of nutritional risk according to age group among clinical patients at a university hospital in northeastern Brazil, 2010.

gender, base disease or age. These findings may be explained by the sample size, the considerable variability in diseases and the homogeneity of the sample in terms of age.

The present study offers an outline of the nutritional status of clinical patients upon admission to a university hospital in northeastern Brazil. The results of this

study may serve as the basis for comparisons with subsequent studies involving a larger sample and other hospital institutions. This issue is of considerable importance to the scientific community as well as patients who will benefit from the most adequate treatment strategy.

Conclusion

A high percentage of clinical patients in the present study were at nutritional risk, which corroborates findings described in the literature. Nutritional risk was associated with low food intake, underweight and unintentional weight loss. These results underscore the importance of nutritional care upon admission to hospital, which can contribute to improving or maintaining nutritional status and the avoidance of complications throughout the hospitalization period.

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