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REVIEW ARTICLE

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Nutritional Risk Screening (NRS 2002) as a tool to predict clinical outcomes in hospitalized patients: a literature review

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Abstract

The presence of malnutrition in hospitalized patients is prevalent and studies show its association with a higher incidence of complications, mortality, length of stay, costs, and increased frequency of hospital readmission. Routine use of simple tracking procedures is recommended. Nutritional screening detects individuals who are malnourished or at risk of developing malnutrition, and who can receive specific nutritional support. Nutritional Risk Screening (NRS 2002) is a nutritional screening method recommended by the European Society for Clinical and Metabolism (ESPEN) and identifies the risk of developing malnutrition in hospitalized patients. The aim of this paper is to review the literature on the NRS screening method (2002) and its relationship with clinical outcomes in hospitalized patients.

Keywords: Malnutrition. Screening. NRS 2002. Nutritional risk. Hospitalized patient.

Introduction

Malnutrition is currently defined in a basic way, as any change in the composition, physiology, or functionality of an organism, caused by a diet or disease state that negatively affects the nutritional status **[1]**. The presence of malnutrition in hospitalized patients is frequent and studies show its association with a higher incidence of complications, mortality, length of stay, costs, and increased frequency of hospital readmission **[2,3]**. In this regard, it is an important public health problem in industrialized and emerging countries and its development in the hospital environment may be due to reduced nutrient intake, deficiency in the absorption or loss of nutrients due to disease or trauma, or increased demands during the illness **[2]**.

The Brazilian Nutrition Survey (IBRANUTRI), a study that aimed to trace the nutritional profile of patients hospitalized in several hospitals throughout Brazil, showed that the average hospital stay for well-nourished patients was 6 days, while for moderately malnourished and severely malnourished patients, spend an average of 9 and 13 days in the hospital, respectively. The study also showed that almost half of the hospitalized population in Brazil has some degree of malnutrition **[4]**. Malnutrition is regularly undetected and undertreated in clinical practice. According to studies, less than 50% of malnourished patients received adequate nutritional treatment, for not having their nutritional status properly recognized **[4]**.

Furthermore, several methods of assessment of nutritional status have been developed to assist in the recognition of malnourished patients or those at nutritional risk in the hospital environment, contributing to the early nutritional intervention and implementation of a nutritional plan. The routine use of simple screening procedures is recommended **[5,4]**.

Nutritional screening detects individuals who are malnourished or at risk of developing malnutrition, and who can receive specific nutritional support. However, it is necessary to apply a simple, effective, and validated tool for hospital use **[4]**. Nutritional Risk Screening (NRS 2002) is a nutritional screening method recommended by the European Society for Clinical and Metabolism (ESPEN) and identifies the risk of developing malnutrition in hospitalized patients. It was created for application in the hospital environment and must be performed within 72 hours after patient admission **[6]**.

Its application encompasses all adult patients, regardless of disease and age, and includes all clinical, surgical, and other patients present in the hospital environment **[7]**.

The classification of hospitalized patients, using this screening method, is categorized according to two components, nutritional status and disease severity, to which scores from 0 to 3, absent, mild, moderate, and severe, respectively, are attributed. If the age is greater than or equal to 70 years old, the value of 1 point is added to the final score. A patient who obtains a score equal to or greater than 3 points is considered at nutritional risk **[6]**.

Given this, this study aimed to review the literature on the NRS screening method (2002) and its relationship with the clinical outcome in hospitalized patients.

Methods

Study Design

The present study was followed by a systematic literature review model, according to the PRISMA rules. Access available at: http://www.prisma-statement.org/

Data sources and research strategy

Clinical studies were included as case reports, retrospective, prospective and randomized trials with qualitative and/or quantitative analysis. Also, some review studies were included. Initially, the keywords were determined by searching the DeCS tool and MeSH Terms system.

Mesh Terms

The main MeSH Terms were *Malnutrition; Screening; NRS 2002; Nutritional risk; Hospitalized patient*. The literature search was conducted through online databases PubMed, Periodicos.com, Google Scholar, Ovid, Scopus,Web of Science and Cochrane Library.

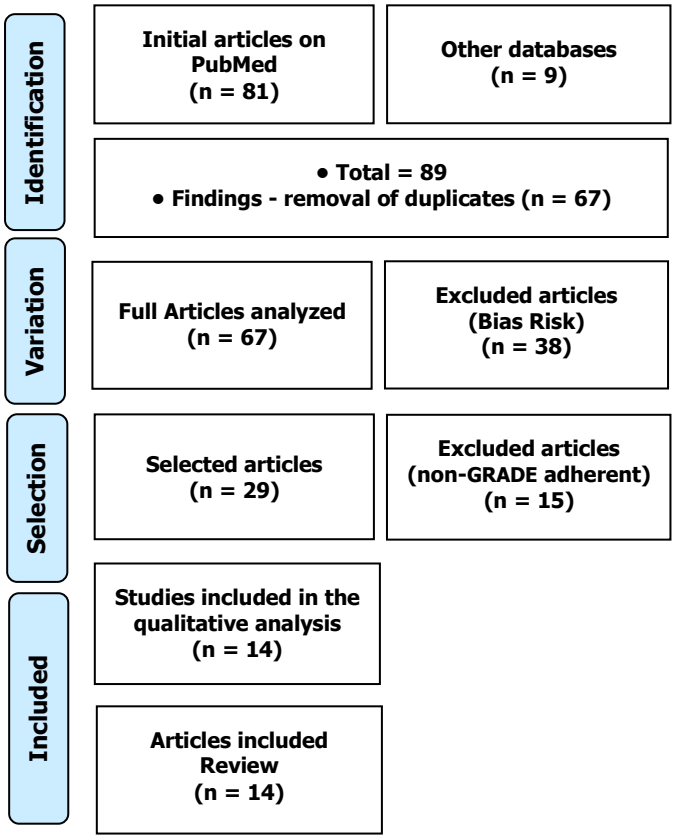
Study Quality and Risk of Bias

The quality of the studies was based on the GRADE instrument, with randomized controlled clinical studies, prospective controlled clinical studies, and studies of systematic review and meta-analysis listed as the studies with the greatest scientific evidence. The risk of bias was analyzed according to the Cochrane instrument.

Litrature Review and Discussion

A total of 89 articles were found involving *malnutrition and hospitalized patient*. Initially, was held the exclusion of existing title and duplications following the interest described in this work. After this process, the summaries were evaluated and a new exclusion was held. A total of 29 articles were evaluated in full, and 14 were included and discussed in this study (**Figure 1**). NRS 2002 is a tool developed by Kondrup et al. Its development started from the assumption that the indications for nutritional therapy should include factors related to the severity of malnutrition and the high nutritional needs that arise due to the installed disease **[6]**.

Figure 1. The selection process of scientific articles.



This nutritional screening method, when compared to other screening tools, has as a differential the patient's age, which is added to the final score when it is 70 years old or more. And it is already reported in several studies that an additional factor for the deterioration of nutritional status is age. The physiological changes in this phase compromise strength and mobility and increase nutritional frailty in the elderly. Additionally, in the disease, the use of medications and the physiological response to the injury worsen this situation [6,8]. Furthermore, Teixeira et al, used the NRS 2002 as a screening method in a study that evaluated 148 patients admitted to the hospital of the Paraná clinics and found that 41.2% were at no nutritional risk and 58.8% were at nutritional risk. Among the individuals who died, 25% had some degree

of malnutrition [9].

In a study carried out in Belo Horizonte, Jansen et al, observed that the NRS 2002 identified more than half of hospitalized patients (54.5%) at risk of malnutrition on admission. In addition, the nutritional risk was positively associated with the therapeutic outcome of the referral to the palliative care team or death [8]. This result is similar to that found by Silva et al, who, when assessing the nutritional risk of patients hospitalized in emergency service in the city of São Paulo, found that 63% were at risk by the NRS. In this same study, it was observed that mortality was significantly higher among patients at nutritional risk, the mortality rate among patients without risk was 3.9%, while the mortality rate among patients at risk was 17.6 % [10].

Conclusion

The data presented in this review suggest that the 2002 NRS is a good predictor of clinical outcomes in hospitalized patients, especially in relation to the length of stay and death. Furthermore, the data reveal the importance of reducing malnutrition in the hospital environment. This reality will only be achieved if patients at nutritional risk are correctly identified and soon after, receive an adequate nutritional intervention. Thus, using the NRS 2002 screening method in clinical practice would be of great importance, as it appears to be a simple and practical method, with proven efficiency in the detection of nutritional risk according to the literature, in addition to being the screening tool recommended by the EXPENSE.

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Data sharing statement

No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

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