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Original article

# Evaluation of the effect of an intervention on the nutritional status of hospitalized patients☆

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ABSTRACT

*Background and objectives:* To compare the nutritional status of a population of hospitalized patients, divided into 2 different groups, both at admission and hospital discharge, and to assess the influence of nutritional alteration during the hospital stay.
*Material and methods:* Quasi-experimental study comprising 2 groups of patients (N = 581): an intervention group (n = 303), in which nurses received specific training on managing care methodology, and a control group (n = 278), in which nurses continued their usual dynamics. Each group was made up of 2 care units with patients from both surgical and medical specialties. Inclusion criteria: patients admitted to the selected units with a minimum stay of 5 days. The sample selection was performed prospectively and consecutively after implementing the training.
*Results:* Of the 581 patients studied, 49.4% were women and 50.6% were men. Mean patient age was 68.29 (SD 16.23) years. In the intervention group, the odds ratio (OR) associated with good nutritional status was multiplied by 1.7 (OR = 1.67) compared to the control group in the first evaluation and by 1.4 times (OR = 1.43) at hospital discharge. The average stay in days was higher in the control group (13.71, SD 10.19) than in the intervention group (10.89, SD 7.49) ($p < 0.001$).
*Conclusion:* The systematic methodology-based intervention in the chosen units was positive. Patients admitted to the intervention units had a lower nutritional alteration and a shorter hospital stay than those admitted to the control units.



## Evaluación del efecto de una intervención en el estado nutricional de pacientes hospitalizados

*Palabras clave:*
Evaluación nutricional
Intervención enfermera
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RESUMEN

*Fundamento y objetivos:* Comparar el estado nutricional de una población de pacientes hospitalizados distribuidos en 2 grupos diferentes, tanto al ingreso como al alta hospitalaria y evaluar la influencia de la alteración nutricional en la estancia hospitalaria.
*Material y métodos:* Estudio cuasiexperimental formado por 2 grupos de pacientes (N = 581): un grupo de intervención (n = 303), en el que las enfermeras responsables recibieron formación específica en metodología de cuidados y otro de control (n = 278), en el que las enfermeras siguieron su dinámica habitual. Cada grupo estaba compuesto por 2 unidades de cuidados con pacientes tanto de especialidades médicas como quirúrgicas. Criterios de inclusión: pacientes ingresados en las unidades elegidas con una estancia mínima de 5 días. La selección de la muestra se realizó de manera prospectiva y consecutivamente tras realizar la acción formativa.

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*Resultados:* De los 581 pacientes estudiados, el 49,4% eran mujeres y el 50,6% hombres, con una edad media de 68,29 (DT 16,23) años. En el grupo intervención, la *odds ratio* (OR) asociada a un buen estado nutricional se multiplicaba por 1,7 veces (OR = 1,67) respecto al grupo control en la primera evaluación y por 1,4 veces (OR = 1,43) al alta. La estancia media en días resultó mayor en el grupo control (13,71, DT 10,19) que en el grupo intervención (10,89, DT 7,49) (p < 0,001).
*Conclusión:* La intervención basada en metodología sistematizada en las unidades intervenidas resultó positiva. Los pacientes ingresados en ellas presentaron una menor alteración nutricional y una menor estancia hospitalaria que los ingresados en las unidades control.


## Introduction

Clinical safety is a critical dimension of quality of care focused on identifying and avoiding the adverse events (AEs) experienced by patients. The appearance of AEs and its consequences are expressed in terms of extended stays, disability and morbidity in patients who experience them, not to mention the economic costs that this entails.[1] Therefore, prevention must be a priority in all the countries' healthcare policies. Studies conducted in hospitals in the western world have shown that the incidence of patients who develop AEs is about 10%, with hospital malnutrition being, among others, one of the most prevalent.[1,2]

A hospitalized patient is a patient at risk from a nutritional point of view; the very dynamics of a hospital so determines it due to long fasts, suppression of food intake for diagnostic tests, administration of serum therapy for long periods of time, treatment, inadequate meal times, restrictive diets, etc.[2]

Several studies support that the patient's nutritional status assessment on admission has a major impact on health status progression.[3–5] A pioneering study by Tucker and Miguel,[6] in which 2485 patients from 20 hospitals were reviewed, confirmed the presence of high rates of malnutrition, poor attention to malnourished patients and a reduced hospital stay when this problem was addressed early. Another review study by Guigoz[7] in hospitalized elderly patients assessed with the *Mini Nutritional Assessment* (MNA) scale showed a prevalence of malnutrition of 23% and a risk of malnutrition of 46%.

The multicenter study Prevalence of Hospital Malnutrition and Associated Costs in Spain (PREDyCES),[8,9] which evaluated the prevalence and costs of hospital malnutrition in Spain, and included 1597 patients from 31 hospitals which were representative centres of the national health map, indicated that 23% of patients admitted to hospital are at risk of malnutrition (according to the NRS-2002 test criteria). Both at admission and discharge, the highest prevalence of malnutrition is concentrated in the over 85 years' age group, with 47% of malnutrition at admission and 50% at discharge. On the other hand, 9.6% of malnourished patients developed malnutrition during hospitalization. Patients with malnutrition (at admission or discharge) had a significantly higher average hospital stay.[8]

In another multicenter intervention study conducted later in 35 Spanish hospitals by Sanz et al.,[10] 1090 patients were evaluated by the MNA scale, detecting that 39.1% had malnutrition and 21.2% risk of malnutrition.

The Spanish Society of Parenteral and Enteral Nutrition (SENPE)[11] promotes some recommendations in a multidisciplinary consensus document on the approach of hospital malnutrition in Spain; among them is that in the first 24–48 h of hospital admission a screening method should be performed to detect malnutrition early. This recommendation has a level of evidence A. Considering the high prevalence of hospital malnutrition and the negative effect it has on patient outcomes, it is essential to find ways to avoid it or at least reduce it.

To perform a rapid nutritional assessment and at first level, various scales have been used, with MNA being a validated scale, used internationally. This test has a short version or screening, the *Mini Nutritional Assessment Short-Form* (MNA-SF), developed and validated in 2001 by Rubenstein et al.[12] and revised in 2009 by Kaiser et al.,[13] which incorporates a cut-off point for the state of malnutrition; so, people can be classified into 3 groups (normal nutritional status, risk of malnutrition and malnutrition), coinciding with the 3 categories of the complete version. Another novelty is that the body mass index can be replaced by the calf's circumference. Both versions have shown high sensitivity and specificity, with an excellent prediction compared to the complete MNA version.[12–17] Some authors[17,18] have compared the MNA-SF with other tools, considering it as one of the best tools due to its high sensitivity, reliability and validity.

The essential reason that motivated conducting this study lies in the lack of research available in our setting on the results obtained in terms of clinical safety depending on the nursing care method used. Therefore, as objectives, on the one hand, we aimed to compare the incidence of malnutrition and/or the risk of developing it among hospitalized patients, divided into 2 different groups, both at admission and at discharge, and, on the other, to assess the influence of nutritional disorders regarding hospital stay.

## Material and methods

### Design

A quasi-experimental study was designed consisting of 2 groups of patients: one of intervention, in which nurses responsible for providing the needed care received specific training in care methodology, and another one of control, in which nurses continued their usual routine care protocols.

The study was conducted in a tertiary hospital of the city of Valencia which has 582 conventional hospital beds, covering a population of approximately 345,000 citizens. The healthcare units that had the highest average stays per patient were chosen for its development: Internal Medicine, Neurology/Neurosurgery, Nephrology/Vascular Surgery and Traumatology/Urology.

Two groups were formed, composed of 2 units each, so that both groups had patients with medical and surgical specialties. The intervention was performed in the group composed of Nephrology/Vascular Surgery and Traumatology, while the other group, the one made up of Internal Medicine and Neurology/Neurosurgery, acted as a control group. In each group, a minimum sample size of 258 patients was considered for a confidence level of 95% and a statistical power of 80%, estimating an incidence of 16% in the control group and 8% in the intervention group. Patients admitted during the study period who had a minimum stay of five days met the inclusion criteria, as this was considered sufficient time to develop the AEs object of study. The selection of the sample was performed prospectively and consecutively after the