

BRIEF COMMUNICATION



Recognising undernutrition in a community hospital: the nursing judgement is insufficient

Beatrice Gasperini^{1,2✉}, Gilda Pelusi³, Annamaria Frascati⁴, Ilenia Carletta¹, Franco Dolcini⁵, Donatella Sarti¹, Emma Espinosa² and Emilia Prospero¹

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INTRODUCTION: Standardised nutritional screening methods improve the rate of recognising older patients with undernutrition, which is strongly encouraged in hospitals and residential settings. Therefore, our study compared the rates of identifying undernutrition before and after introducing the Mini Nutritional Assessment (MNA[®]) in a community hospital.

METHODS: This was a single-centre, retrospective, observational before–after study. Participants were subjects aged 65 years or older, admitted to a community hospital from May 2018 to December 2020. The nursing assessment at admission included the MNA[®] from January 2020. The prevalence of undernutrition gathered by nursing diagnoses from 2018 to 2019 was compared with data obtained using the MNA[®] in 2020. Then, a confirmatory analysis was conducted to compare the prevalence of undernutrition in 2020 when both nursing diagnoses and the MNA[®] were used.

RESULTS: We analysed data of approximately 316 patients (238 before and 78 after introducing the MNA[®]). Overall, results showed that 47.1% ($n = 149$) of the patients were undernourished. As observed, the prevalence of undernutrition was 38.6% ($n = 92$) in 2018–2019 and 73.1% ($n = 57$) in 2020 ($p < 0.001$). In 2020, however, 38.5% of patients ($n = 30$) were identified as undernourished using the MNA[®] but not using nursing diagnoses. Therefore, the correlation between these two methods was poor (Pearson's correlation 0.169, $p = 0.14$).

CONCLUSION: Identifying elderly patients with undernutrition significantly increased after introducing the MNA[®]. Undernutrition is a common condition that should be systematically screened using a validated tool to activate personalised nutritional interventions promptly.

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INTRODUCTION

Undernutrition is defined as a state resulting from the lack of intake or uptake of nutrition that leads to altered body compositions (decreased fat-free mass) and body cell mass.

Its prevalence varies significantly across different settings [1]. This prevalence ranges from 3% to 4% in community-dwelling older people to approximately 70% in long-term care settings [2]. Besides, a close relationship between undernutrition and poor outcomes has been well documented in older persons. This condition results in diminished physical and mental function, including impaired clinical disease outcomes [3]. Moreover, undernutrition increases the rate of infections and pressure sores, increases mortality and prolongs hospital stay/length of convalescence duration after an acute illness [4].

Nevertheless, screening for undernutrition is considered poor in older adults [5]. Previous studies have shown a lack of attentive healthcare around clinical nutrition by professionals [6]. Lack of interest by doctors and nurses, competing priorities and limited availability of nutritional supplements outside the hospital are also reasons that hinder nutritional care [7]. Furthermore,

documentation practices regarding nutritional status in hospitals and transitional care are unsatisfactory [8].

Further, interventions to prevent and treat undernutrition for older adults in transitional care setting allow the improvement of clinical outcomes for older patients [9, 10],

Using a multidimensional assessment for geriatric patients in community hospital enables identification of risk of nearness of end of life and acute hospitalisation to target care and treatment [11]. Thus, effective and simple tools to identify healthcare needs are mandatory. Therefore, our study compared the identification of undernutrition before and after introducing the Mini Nutritional Assessment (MNA[®]) in a community hospital.

MATERIALS AND METHODS

This was a single-centre, observational, retrospective before–after study conducted in the community hospital of Loreto (Ancona) between 1 May 2018 and 31 December 2020.

Our community hospital had 19 beds, to which patients were admitted from the hospital or home. During the study, four general practitioners, three specialist physicians, 16 nurses and 16 healthcare workers managed

¹Section of Hygiene and Public Health, Università Politecnica delle Marche, Via Tronto 10, 60126 Ancona, Italy. ²Geriatrics, Azienda Ospedaliera Ospedali Riuniti Marche Nord, Viale Vittorio Veneto, 2, 61032 Fano, PU, Italy. ³School of Nursing, Università Politecnica delle Marche, Via Tronto 10, 60126 Ancona, Italy. ⁴Intermediate care-Community Hospital, Area Vasta 2, Via San Francesco D'Assisi 1, Loreto, AN 60025, Italy. ⁵ASUR Marche, Ancona, Viale Colombo 106, Ancona 60127, Italy. ✉email: b.gasperini@univpm.it

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the patients. Nursing care was also provided 24 h after implementation in January 2020 for 7 days per week.

When a malnourished patient is identified, personalised interventions are implemented (i.e. prescription of fortified foods). In January 2020, the MNA[®] was implemented in our community hospital. First, a brief training session was conducted for all nurses. MNA[®] administration takes about five minutes to be completed, and it is easily accepted by nurses and patients. Then, a result comparison was conducted during the first week to resolve the inconsistencies by discussion.

The sample was selected using a non-probabilistic strategy. A convenience sample based on the period of admission in community hospital was selected. Accordingly with inclusion and exclusion criteria, our study included subjects admitted to our community hospital from May to December, in 2018–2020, to guarantee a reasonable time for the nurses to become confident with the use of the MNA[®] and to avoid possible seasonal effects on the nutritional status.

Inclusion criteria were patients older than 64 years, who stayed longer than 72 h and who had been admitted between May and December in 2018, 2019 and 2020; whereas exclusion criteria were incomplete nursing assessment.

The study was conducted according to the Declaration of Helsinki and current legislation. The Ethics Committee of Marche Region does not require formal approval for observational studies that do not involve the use of drugs. All subjects provided written informed consent to access personal and clinical data at admission in the community hospital.

Data source

Our data were derived from the routine nursing assessment conducted at admission. Every patient undergoes a standardised assessment within 48 h from admission, including several domains. Age and sex were the socio-demographic data obtained.

Nursing diagnoses based on the North American Nursing Diagnosis Association International (NANDA-I edition 2009–2011) taxonomy were also collected. They are clinical judgements about current or potential reactions to health problems of individuals, families, or communities. Furthermore, they are the basis for choosing nursing interventions to achieve nursing outcomes for which the nurse is responsible [12]. These diagnoses explored 13 domains (categories) as follows: health promotion; nutrition; elimination and exchange; activity/rest; perception/cognition; self-perception; role relationships; sexuality; coping/stress tolerance; risk principles; safety/protection; comfort and growth/development.

Afterwards, pressure sores (grade 2–4) at admission were recorded, including the presence of a urinary catheter, stoma, nasogastric tube, and percutaneous endoscopic gastrostomy (PEG).

Vascular catheters were also recognised. However, for our purpose, we considered a midline catheter, peripherally inserted central catheter, short-term central vascular access device, skin-tunnelled catheter, and implanted port. Additionally, our analysis excluded a peripheral cannula (less than 7.5 cm in length).

The assessment included the evaluation of the risk of falling using the Conley scale [13]. Hence, a patient is at risk of falling if the Conley score is equal to or higher than two.

Furthermore, the Norton Plus score is used to assess the risk of developing pressure sores [14]. A score lower than 10 means a high risk of developing pressure sores.

Finally, comorbidities were recorded using a pre-coded clinical condition list (neuropsychiatric, cardiological, pneumatological, infectious and oncological).

Definition of nutritional status

Nursing diagnoses. For our purpose, we considered nursing diagnoses in the nutrition domain. The diagnostic parameter accounting for under-nutrition was 'Nutrition: imbalanced diet less than body requirements and intake of nutrients insufficient to meet metabolic needs' [15].

Mini Nutritional Assessment. The MNA[®] is a validated tool to screen and assess the nutritional status in older adults [16]. Its use is recommended for older adults compared to other tools [3]. The MNA[®] includes six screening components: decreased food intake; weight loss, psychological stress/acute disease in the last 3 months; mobility; neuropsychological problems and body mass index. It also includes 12 components of assessment as follows: living independently; taking more than three drug prescriptions daily; pressure sores; daily full meal quantities consumed; daily protein intake; daily fruit/vegetable intake; daily fluid intake; mode of feeding; self-view of nutritional status; self-perception of health status; mid-arm

circumference and mid-calf circumference. The MNA[®] takes five to ten minutes to complete. Based on the MNA[®], nutritional risk was also assessed using nourished participants (score 24–30), those at risk of malnutrition (score 17–23.5) or malnourished participants (score < 17) [16].

Statistical analyses

Continuous data were presented as the mean \pm standard deviation or the median and interquartile range, whereas categorical data were presented as the frequency and percentage. Comparisons were made using Student's t-test or the chi-squared test, when appropriate. The variance was tested using Levene test. Fisher's exact test was also used for expected frequencies less than five. Correlation between nursing diagnosis and MNA was tested using Pearson correlation.

Subsequently, a confirmatory analysis was conducted to compare the prevalence of undernutrition in 2020 when both nursing diagnoses and the MNA were administered.

Furthermore, statistical significance was set at 0.05, and analyses were conducted using SPSS v.25 (Chicago, IL).

Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement guidelines for reporting observational studies were also followed for conducting and reporting this study [17].

RESULTS

Overall, 501 patients were admitted in our community hospital from January 2018 and December 2020. A total of 154 patients were excluded from our sample because they were admitted between January and May. Further, 30 patients were excluded due to an age younger than 65 years.

Finally, our sample comprised 316 patients (238 enrolled before and 78 after the introduction of the MNA[®]).

The mean age of the participants was 84 ± 7.6 years, of which 66% were women ($n = 209$), 61.4% had a urinary catheter ($n = 194$) and 40.8% had a vascular device ($n = 129$). Approximately 35% of the subjects had pressure sores on admission ($n = 113$). The main comorbidities were cardiological (83.5%, $n = 264$), neuropsychiatric (65.5%, $n = 207$) and pneumatological (43%, $n = 136$). Moreover, comparing patient characteristics enrolled before and after the introduction of the MNA[®] did not show any difference ($p > 0.05$) (Table 1).

Undernutrition was identified in 149 patients (47.1%). Of those, 92 patients (38.6%) were identified during the before phase, compared with 57 patients (73.1%) in the after phase ($p \leq 0.001$). Not undernourished patients were 162 (51.3%) of the whole sample, 146 (61.4%) in the before phase and 21 patients (26.9%) in the after phase ($p < 0.001$).

Results of our confirmatory analyses after both nursing diagnoses and the MNA[®] had been applied are shown in Fig. 1. Only 27 patients (34.7%) were undernourished using both methods. Furthermore, 30 patients (38.5%) were undernourished using the MNA[®] but not with nursing diagnoses. Moreover, six patients (7.7%) were considered undernourished using nursing diagnoses only, and not with the MNA[®] ($p = 0.136$). Pearson's correlation between the two methods was 0.169 ($p = 0.14$).

DISCUSSION

Our study described the prevalence of undernutrition in older patients admitted to a community hospital. Assessments were conducted to compare results before and after introducing the MNA[®]. We observed that the prevalence of undernutrition estimated using the MNA[®] was double that recognised by using nursing diagnosis.

The prevalence of undernutrition in older adults depends largely on the clinical setting. Studies based on the use of the MNA[®] identified a prevalence of 3–11% in community-dwelling older subjects, 22–29% in hospitalised patients, 17.5–29% in nursing homes and rising to 30% in rehabilitation/sub-acute care settings [1, 18]. Therefore, nutritional screening is strongly

Table 1. Total sample characteristics and before and after comparison of patients' results.

	Total N = 316	Before N = 238	After N = 78	p Value
Female, n (%)	209 (66.1)	153 (64.3)	56 (71.8)	0.224
Age (years, mean ± SD)	84.4 ± 7.6	84.6 ± 7.8	84.0 ± 7.2	0.601
Urinary catheter, n (%)	194 (61.4)	150 (63.0)	44 (56.4)	0.289
Vascular devices, n (%)	129 (40.8)	96 (40.3)	33 (42.3)	0.791
Pressure sores, n (%)	113 (35.8)	80 (33.6)	33 (42.3)	0.164
Nasogastric tube/PEG, n (%)	37 (11.7)	25 (10.5)	12 (15.4)	0.245
Parenteral nutrition, n (%)	21 (6.6)	17 (7.1)	4 (5.1)	0.535
Stoma, n (%)	11 (3.5)	9 (3.8)	2 (2.6)	0.611
Conley score (mean ± SD)	4.8 ± 2.5	4.7 ± 2.5	5.1 ± 2.5	0.199
Norton Plus score (mean ± SD)	10.2 ± 3.8	10.2 ± 3.7	10.3 ± 3.9	0.971
Comorbidities, n (%)				
Cardiological	264 (83.5)	196 (82.4)	68 (87.2)	0.318
Neuropsychiatric	207 (65.5)	160 (67.2)	47 (60.3)	0.261
Pneumatological	136 (43.0)	106 (44.5)	30 (38.5)	0.347
Orthopaedic	105 (33.2)	74 (31.1)	31 (39.6)	0.159
Infectious	81 (25.6)	59 (24.8)	22 (28.2)	0.549
Haematological	46 (14.6)	32 (13.4)	14 (17.9)	0.328
Neoplastic	43 (13.6)	30 (12.6)	13 (16.7)	0.364
Undernutrition, n (%)	154 (48.7)	92 (38.6)	57 (73.1)	<0.001
Not undernourished, n (%)	162 (51.3)	146 (61.4)	21 (26.9)	<0.001

Statistically significant differences are reported in bold.

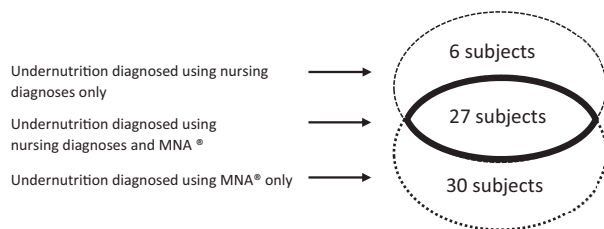


Fig. 1 Comparison between the undernutrition frequencies observed was estimated using the MNA® and nursing diagnoses for patients admitted in 2020. The set intersection shows undernourished subjects recognised using both nursing diagnoses and the MNA®.

encouraged in hospitals and residential settings [19]. However, the attention given to managing nutritional problems in the elderly is considered poor [5], and data on undernutrition in intermediate care are scarce.

A community hospital is a setting where nurses play a leading role in identifying patients' healthcare needs. Based on the primary care reforms in Italy, an increase in older adults admitted to community hospitals is expected. Community hospitals admit patients from home or discharged from hospitals with worsening chronic conditions. These patients experience acute and extremely long illnesses. Acute and chronic illnesses are widespread nutritional problems caused by reduced dietary intake and a combination of catabolic conditions, with leading rapidly to undernutrition [20]. Therefore, the expected undernutrition rate is much higher than that recorded in hospitals. Thus, we identified a 45.9% prevalence of undernourished patients in our community hospital, and this percentage increased to 70% using the MNA®. The responsibility for identifying undernourished patients lies with all healthcare professionals, including nurses. Hence, nursing support of multidisciplinary nutrition care is advocated to improve patient outcomes [21]. However, nurses can be reluctant to assess nutritional status because of difficulties in recognising malnutrition and calculating energy needs, and the lack of knowledge

about nutrition and nutritional techniques, and the lack of time [22]. Furthermore, the nutritional knowledge of health personnel has remained heterogeneous and constantly calls for better training and more effective updates among nurses [23].

The MNA® is a validated screening tool used in more than 2000 studies [18] recommended for nutritional assessment in older adults [3]. Additionally, the MNA® considers several nutritional status compounds, making it the only tool that evaluates the intake of nutrient food groups, which allows for nutritional intervention [18].

The nursing assessment includes validated tools to identify nursing diagnoses and develop a personalised care plan, such as the Conley scale and the Norton Plus scale that correctly identifies patients at risk of falls and pressure sores. Likewise, our study showed that nursing assessment includes a specific tool for nutritional assessment, which otherwise remains an underestimated problem. Moreover, the poor correlation between the MNA® and nursing diagnoses confirms these findings. Based on the primary care reforms in Italy, an increase in older adults admitted to community hospitals is expected.

LIMITATIONS

The main limitation of our study was related to the small sample size enrolled in a single-centre. Additionally, we observed that the spread of coronavirus disease 2019 reduced the number of beds and patients admitted in a community hospital, owing to the rules. However, a regional law, active since 2017, established the clinical characteristics of patients eligible for admission in a community hospital. So, it is reasonable to assume that patients admitted to other community hospitals had characteristics similar to ours.

Before-after studies are generally considered to have lower internal validity than controlled trials [24]. Therefore, to reduce the risk of bias in our study, we chose a control group of patients admitted within the same period of 3 years to avoid a possible seasonal effect on nutritional status. The results showed that the characteristics of the two groups did not show differences in age, comorbidities, use of devices and risk of falls and pressure sores. Finally, we conducted a confirmatory analysis to verify the

difference among patients admitted in 2020 who underwent both nursing diagnoses and the MNA®.

Only a few studies have assessed the ability of nursing diagnoses to identify undernutrition compared with a validated tool [15]. Moreover, findings from our studies are original in this perspective. Furthermore, data on the prevalence of undernutrition in community hospitals are lacking. Nevertheless, our findings contribute to research on the validity of nursing diagnosis, which has recently focused on nutritional status [25].

CONCLUSIONS

After introducing the MNA®, identifying undernutrition in our community hospital doubled the estimation obtained using nursing diagnoses only. Therefore, the use of the MNA allows healthcare providers to identify undernourished subjects. Besides, undernutrition is a common condition in community hospitals that should be systematically screened using a validated tool to activate personalised nutritional interventions promptly.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, BG, upon reasonable request.

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AUTHOR CONTRIBUTIONS

BG: Study concept and design, analysis, and interpretation of data, writing the report, conducting the search. GP: Study concept and design, formulating the research question, interpretation of data. AF: Acquisition of data, interpretation of data, writing the report. IC: Acquisition of data, interpretation of data, writing the report. FD: Acquisition of data, interpretation of data. DS: Analysis and interpretation of data, writing the report, extracting, and analysing data, interpreting results, and creating tables and figures. EE: Drafting of the manuscript, critical revision of the manuscript for important intellectual content and provided feedback on the report. EP: Conceived and designed the experiments, analysis and interpretation of data, critical revision of the manuscript for important intellectual content and provided feedback on the report.

COMPETING INTERESTS

The authors declare no competing interests.

ETHICAL APPROVAL

Given this was a retrospective observational study, ethical committee approval was not required. The study was performed in accordance with the Code of Ethics of the World Medical Association for experiments involving humans (Declaration of Helsinki) and research on health databases (Declaration of Taipei). Patients and caregivers gave their consent to use their personal data at their admission to the CH. Patient anonymity was respected during the process of data analysis and results reporting.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Beatrice Gasperini.

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