ORIGINAL RESEARCH

Recognition by medical and nursing professionals of malnutrition and risk of malnutrition in elderly hospitalised patients

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Abstract

Objective: To determine the prevalence of malnutrition in a population of elderly hospitalised patients and to explore health professionals' perceptions and awareness of signs and risks of malnutrition and treatment options available.

Subjects and design: One hundred elderly patients and 57 health professionals from medical wards of a tertiary teaching hospital. Quantitative and qualitative study design using a validated malnutrition assessment tool (Mini Nutritional Assessment) and researcher-designed questionnaire to assess health professionals' knowledge of nutrition risk factors.

Main outcome measures: Mini Nutritional Assessment score, nutrition risk category and themes in health professionals' knowledge and awareness of malnutrition and its risk factors.

Results: Thirty per cent of patients were identified as malnourished while 61% were at risk of malnutrition. Documentation by health professionals of two major risk factors for malnutrition—recent loss of weight and appetite—were poor with only 19% and 53% of patients with actual loss of weight or appetite, respectively, identified by staff and only 7% and 9% of these patients, respectively, referred for dietetic assessment. While health professionals' knowledge of important medical risk factors for malnutrition was good, their knowledge of malnutrition risk factors such as recent loss of weight and loss of appetite was poor. Medical staff focused on biochemical factors when assessing nutrition status, while nursing staff focused on skin integrity and turgor.

Conclusion: Malnutrition in elderly hospitalised patients remains a significant problem with low rates of recognition and referral by medical and nursing staff. Considerable scope exists to develop training and education tools and to implement an appropriate nutrition screening policy to improve referral rates to dietitians.

Key words: malnutrition, medical staff, nutrition assessment, perception, screening.

INTRODUCTION

Although identified as a significant issue 33 years ago,[1] a high percentage of current hospitalised patients are either malnourished or at risk of malnutrition.[2] While the prevalence of malnutrition in Australian hospitals varies according to survey methodology and patient demographics it has been estimated to fall between 35% and 43%.[3–5]

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Malnutrition is a serious medical concern in the elderly and is directly related to increasing hospital length of stay, treatment costs, infection and complication rates and mortality.[4,6] Reasons for poor nutritional status in the elderly are multifaceted and include physiological, psychological and social changes associated with reduced food intake and reduction in body weight.[7,8] Nutritional status often further deteriorates following hospitalisation with factors such as dislike of menu options, increased nutrient requirements, nausea, loss of appetite and periods of nil-by-mouth all impacting on a patient's nutritional status.[9]

Poor recognition and monitoring of nutritional status by hospital staff can also impact on malnutrition risk during hospitalisation.[5] Despite the high prevalence of malnutrition in elderly hospitalised patients, the recognition and documentation of malnutrition is often extremely poor.[3,4,10] There are only limited published studies that have investigated the

reasons behind this aforementioned lack of awareness, although limited education in the undergraduate training years and a lack of continued education in the workforce have been raised as likely explanations.[10–12]

Few studies have explored health professionals' perceptions and awareness of signs and risks of malnutrition and treatment options available. Identification and early referral to a dietitian to address nutrition issues can potentially attenuate a patient's complications and improve the outcomes associated with malnutrition. The present study aimed to determine the prevalence of malnutrition in a population of elderly hospitalised patients using the Mini Nutritional Assessment (MNA). Furthermore, using the same cohort of hospitalised patients, the present study aimed to quantify the level of recognition of nutrition risk factors and to characterise health professionals' views on important factors they believe impact on malnutrition and treatment options available.

METHODS

Setting

The present study was conducted at a major tertiary teaching hospital located in Melbourne, Australia, over a six-week period (July to August 2006). Patients, medical and nursing staff participating in the present study were from the Medical Assessment and Planning Unit (MAPU) and General Medical Units (GMUs) of the hospital.

Malnutrition assessment

All patients admitted to the MAPU and GMUs over a three-week period were included in the present study if they were aged 70 years or over, and were not receiving palliative care. Malnutrition assessment was performed using the MNA tool.[13] The MNA tool is both a screening and assessment tool that has been widely used and validated to assess nutrition risk in the elderly and consists of 18 questions.[13,14] The first six questions of the MNA serve as a screening tool which can indicate possible malnutrition risk and trigger the need to complete the remaining 12 questions for full assessment. On completion of assessment, a total score is obtained which categorises patients as 'malnourished' (score <17), 'at risk of malnutrition' (score 17–23.5) or 'adequately nourished' (score >23.5). The validity of the MNA, using clinical nutritional status as a reference standard, has been reported with a sensitivity of 96% and specificity of 98%.[15] For the purposes of the present study, all patients had the full MNA assessment conducted.

Where patients were ambulatory, weight was determined using ward chair scales. For patients who were immobile, body mass index (BMI) category was estimated based on their mid-upper-arm circumference measurement, while height, where unable to be recalled by the patient, was estimated using ulna length.[16] Mid-upper-arm circumference was measured at the mid-point between the tip of the shoulder and the tip of the elbow with the arm relaxed by the side with the patient sitting if unable to stand. Calf circumference was measured at the point of maximum girth of the calf in a standing position with weight equally distributed on both feet with the patient in a sitting position if unable to stand. Circumferences were measured using a metal tape measure (Executive Thinline W606PM; Lufkin).

Information relating to a patient's nutritional status on admission was noted from the patient's admission history, clinical risk assessment and progress notes within the first 24–48 hours of admission. Documentation of recent loss of weight or appetite, oral intake, height, weight, nausea, vomiting, diarrhoea and constipation, pressure ulcers and functional status was also noted. In addition, any reference to nutrition in the treatment plan such as referral to a dietitian was recorded.

Staff questionnaire

A researcher-designed questionnaire (Appendix I) was used to assess medical and nursing staff's perceptions, knowledge and awareness of signs of malnutrition. Medical and nursing staff were included in the study if they had involvement in admitting any of the patients screened for malnutrition during the first three weeks of the study period. Agency nurses were excluded from the study. Staff that agreed to take part in the study were provided with a copy of the anonymous questionnaire and were given several weeks to complete and return it either by internal mail or directly to the researcher.

Ethical approval

Approval for the study was obtained from the Deakin University Human Research Ethics Committee. The study conforms to the provisions of the Declaration of Helsinki (as revised in Edinburgh 2000).

Statistical analysis

Differences between age and BMI based on nutrition risk category were calculated by one-way ANOVA, while differences in gender distribution based on nutrition risk category were evaluated using the chi-square test. Spearman's rank order correlation was used to determine associations between MNA score and BMI or age. An alpha error of $P < 0.05$ was used to determine statistical significance in all analyses. Data was analysed using SPSS statistical software (version 12.0.1) and results were presented as means ± standard deviation.

RESULTS

During the first three weeks, 109 patients 70 years of age and over were admitted to MAPU or GMUs. Of these admitted patients, seven were excluded as they were undergoing palliative care, while two subjects were discharged before assessment was possible. The remaining 100 patients were

assessed for risk of malnutrition using the MNA. The major Diagnostic Related Group of this population included conditions of the lung (including pneumonia) (33%), falls/decreased mobility/broken bones/joint pain (15%), conditions of the heart (14%) and infections/febrile/sepsis/ urinary tract infections (10%).

Table 1 presents the characteristics of patients according to malnutrition risk category. Prevalence of malnutrition in the study population was found to be 30%, while patients identified as at risk of malnutrition represented 61% of the population. No differences in sex distribution, age or BMI were seen between different nutrition risk categories. BMI was significantly positively correlated with MNA score ($r = 0.435$, $P < 0.01$).

Health professionals' documentation and recognition of two major risk factors for malnutrition, specifically recent unintentional loss of weight and loss of appetite, is presented in Table 2. Of the 61 patients experiencing recent loss of weight, 97% were either at risk of malnutrition or malnourished yet only 19% of these patients were identified, and just 7% referred to a dietitian. A further 8% of the patients with recent loss of weight had documented in their medical history as requiring a dietetic referral, but no referral was actioned. Similarly, 95% of patients with a recent loss of appetite were either at risk of malnutrition or malnourished. Although loss of appetite was more likely to be detected by health professionals (53% of patients identified), only 9% were actually referred to a dietitian, while similarly to patients with recent loss of weight, a further 7% of the patients with recent loss of appetite had written in their medical history as requiring a dietetic referral, but no referral was actioned. Of note, only three of the 100 patients had their weight recorded in the medical history or observation charts.

Of the 29 doctors involved in admitting patients who had been screened for malnutrition, 20 (69%) were followed up

Table 1 Characteristics of patients according to malnutrition risk category

	Total sample	No risk MN	At Risk of MN	MN	At Risk MN or MN
No. of patients	100	9	61	30	91
No. of men/women	50	5/4	33/28	12/18	45/46
Age (years) ± SD	81.9 ± 6.3	80.2 ± 5.7	81.5 ± 6.7	81.0 ± 5.1	81.3 ± 5.9
BMI (kg/m²) ± SD	24.2 ± 4.8	26.6 ± 2.3	24.8 ± 4.9	22.1 ± 4.6	23.5 ± 4.8

MN = malnutrition; BMI = body mass index; SD = standard deviation.

Table 2 Medical documentation and recognition of malnutrition by medical and nursing staff

	Total sample	No risk MN	At risk of MN	MN	At risk of MN or MN
Complete sample					
No. patients (n=)	100	9	61	30	91
Loss of appetite or loss of weight based on MNA assessment	77	4 (44%)	46 (75%)	27 (90%)	73 (80%)
Identified as needing referral to dietitian from medical history notes	8	1 (11%)	3 (5%)	4 (13%)	7 (8%)
Actioned referral to dietitian[a]	7	0	2 (3%)	5 (17%)	7 (8%)
Loss of weight					
No. patients (n=)	61	2	33	26	59
Detected to have loss of weight by medical or nursing staff	11	0	2 (6%)	9 (35%)	11 (19%)
Identified as needing referral to dietitian from medical history notes	5	0	1 (3%)	4 (15%)	5 (8%)
Actioned referral to dietitian	4	0	1 (3%)	3 (12%)	4 (7%)
Loss of appetite					
No. patients (n=)	60	3	33	24	57
Detected to have loss of appetite by medical or nursing staff	31	1 (33%)	16 (48%)	14 (58%)	30 (53%)
Identified as needing referral to dietitian from medical history notes	5	1 (33%)	1 (3%)	3 (13%)	4 (7%)
Actioned referral to dietitian	5	0	2 (6%)	3 (13%)	5 (9%)

[a] Exclusive from those documented as needing a dietetic referral in the medical history where the referral was not actioned.
MN = malnutrition; Per cent figures shown in brackets relate to the number of patients in the malnutrition risk category.

Table 3 Perceived risk factors for malnutrition by medical and nursing staff

Perceived risk factors for malnutrition	Number of responses (Doctors n = 20)	Number of responses (Nurses n = 37)
Medical/Co-morbidity factors		
Chronic disease (incl. cancer, GIT, heart, lung, diabetes)	20 (100%)	37 (100%)
Mobility	9 (45%)	16 (43%)
Age	6 (30%)	13 (35%)
Loss of appetite	3 (15%)	14 (38%)
Dysphagia	3 (15%)	10 (27%)
Nausea/vomiting	2 (10%)	10 (27%)
Stroke	5 (25%)	8 (22%)
Infection	3 (15%)	7 (19%)
Loss of weight	0 (0%)	1 (3%)
Psychological factors		
Depression	18 (90%)	23 (62%)
Dementia/impaired cognition	12 (60%)	18 (49%)
Eating disorders	6 (30%)	20 (54%)
Anxiety	3 (15%)	8 (22%)
Confusion	0 (0%)	7 (19%)
Lifestyle/social factors		
Social isolation/poor social support	17 (85%)	23 (62%)
Alcohol/substance abuse	11 (55%)	18 (49%)
Low socio-economic status	9 (45%)	17 (46%)
Culture/religion	5 (25%)	9 (24%)
Smoking	0 (0%)	9 (24%)
Poor education	0 (0%)	9 (24%)
Additional hospital factors		
Hospital food inadequacies	6 (30%)	18 (49%)
NBM/fasting for tests	7 (35%)	4 (11%)
Assistance required but not given	1 (5%)	10 (27%)
Wounds/surgical procedures	2 (10%)	5 (14%)
Decreased motivation	0 (0%)	5 (14%)
Communication issues	1 (5%)	3 (8%)

GIT = gastrointestinal; NBM = nil by mouth.

and asked to complete the malnutrition risk questionnaire of which all complied. The nine doctors who did not participate in the questionnaire were either on rotation at a different hospital (18%) or on annual leave (13%). A total of 65 nurses were identified as having a role in admitting a patient during the three week study period. Of these 65 nurses, 14 agency nurses were excluded, leaving 51 eligible nurses, of which 37 filled out the questionnaire (73%). Sixty-five per cent of both doctors and nurses had less than 5 years professional work experience.

Table 3 presents all responses by medical and nursing staff when asked about perceived risk factors for malnutrition. Knowledge of important medical risk factors for malnutrition was good; however, there was a low awareness of major nutritional risk factors such as a recent loss of weight and loss of appetite.

Table 4 identifies medical and nursing staff's opinions of the best indicators of nutritional status in acute medical patients. Medical staff most commonly identified albumin and other biochemical markers as being the best indicator of nutritional status followed by BMI/weight and general appearance. Nurses perceived skin integrity and turgor as the best indicator of nutritional status, followed by weight/BMI and oral intake.

When asked to explain their next step for treatment of a malnourished patient, 100% of nursing and 95% of medical staff stated they would refer to a dietitian for nutrition assessment. Other management options considered as appropriate by medical staff included provision of oral supplementation (80%) and enteral/parenteral feeding (60%), while nursing staff would refer to speech pathology (22%) and commence a food record chart (19%).

DISCUSSION

The prevalence of elderly patients identified as at risk of malnutrition or malnourished (61% and 30%, respectively) in the present study is similar to that previously reported in an acute setting,[17] and confirms the serious nature of this issue in the Australian acute hospital setting. Because of the high prevalence of nutrition risk in elderly hospitalised patients, the ability to quickly assess and act, this is of great

Table 4 Perceived indicators of nutritional status in acute medical patients by medical and nursing staff

Best indicators of nutritional status in acute medical patients	Number of responses
Doctors (n = 20)	
Albumin	15 (75%)
Weight or BMI	15 (75%)
Biochemical markers	14 (70%)
General appearance	12 (60%)
Loss of weight	6 (30%)
Oral intake	4 (20%)
Anthropometric measures (skinfolds)	3 (15%)
Nurses (n = 37)	
Skin integrity and turgor	30 (81%)
Weight or BMI	15 (41%)
Oral intake	15 (41%)
Lethargy	13 (35%)
Output/elimination (bowels)	12 (32%)
Loss of weight	11 (30%)
Bloods and albumin	10 (27%)
General appearance	10 (27%)
Loss of appetite	6 (16%)

BMI = body mass index.

importance. Of concern was that only 52% of patients experiencing a marked loss of appetite were detected by health professionals, while only 18% of patients experiencing a recent loss of weight were identified with, actioned referral rates for these patients accounting for less than one in 10 cases.

This is not the first study to identify low rates of nutrition risk documentation by health professionals. Lazarus and Hamlyn found poor documentation of nutrition risk within an Australian hospital, with only one of 137 malnourished patients documented as such in the medical records, and only 21 (15%) referred for nutrition intervention.[3] This suggests a possible lack of awareness of nutrition risk factors by staff, but may also indicate an underlying complacency towards malnutrition. While health professionals demonstrated a good knowledge of medical risk factors for malnutrition, they showed a poor knowledge of major malnutrition risk factors such as a recent loss of weight and loss of appetite. Although 30% of staff were aware that recent loss of weight may indicate possible nutritional concerns, only 19% of patients identified as such from nutritional assessment were recognised by staff, highlighting a degree of complacency towards acting upon nutritional risk factors.

Considering the reasonable knowledge of medical factors and their relationship with poor nutritional status shown by health professionals in the present study, there is clearly a discrepancy between knowledge and what actually occurs in practice. This discrepancy highlights the tendency of medical and nursing professionals in the acute setting to mostly focus on a patient's presenting medical condition and give less credence to other potentially important factors associated with poor health such as nutritional status, mobility, cogni-

tion, social factors and even medication use. One limitation of assessing perceptions of malnutrition risk factors by use of a survey was the semi-prompting nature of the question design where responses for risk factors were grouped under categories. This likely increased the level of prompting for responses of risk factors and if it had not been provided, evidence of knowledge gaps may have been greater.

A patient's current weight and BMI were common responses for the best indicators of nutritional status in an acute setting. However, this was another area where inconsistencies were present in health professionals' knowledge and practice as only three of 100 patients had their weight recorded in the medical history or observation charts. Of concern is that a higher percentage of respondents considered current weight to be a better indicator of nutritional status than recent unintentional loss of weight when in fact recent unintentional loss of weight is a better indicator of nutritional status than current body weight alone. Many patients at nutritional risk may potentially remain undetected by health professionals if they are considered to be at a 'healthy' weight even if recent loss of weight has been identified.

When it comes to identifying the best indicators of assessing nutritional status, most medical staff reported focusing on biochemical factors such as serum albumin, even though levels are influenced by many clinical occurrences other than nutritional status, limiting its use in acutely ill patients.[18] In contrast, nursing staff tended to focus more on physical appearance characteristics, such as skin integrity and turgor.

Regardless of health professionals' knowledge and awareness of risk factors for malnutrition, only a small number of patients were actively referred for dietetic assessment. Barriers that may exist to prevent dietetic referral include time and work-related pressures, inadequate skills or training, or a perceived lack of resources such as a suitable screening tool. In addition they may feel that nutritional screening is not part of their role. However, results from the questionnaire showed that all nursing staff and 95% of medical staff would refer to a dietitian if they thought a patient was malnourished, demonstrating a discrepancy between health professionals' knowledge and what occurs in practice. Having a student dietitian approach the health professional to take part in the survey may bias the aforementioned finding as it can raise awareness of dietetic referral as an appropriate response. To counter, no prompts for answers were given for this question and the dietitian did not verbally administer the survey, or was present when it was completed as the respondents had several weeks to return the survey.

The presence of poor identification and referral rates of patients at nutritional risk is an argument for increased nutritional risk screening and assessment of patients by dietitians; however, even use of a simplistic screening algorithm based on a patient's age, diagnosis and their diet code (as adopted within the nutrition department at the time of the present study) identified just 26 of the 91 (29%) of patients either malnourished or at risk of malnutrition. To combat a low rate of referral to dietitians, a potential strategy might be to adopt a nutrition screening approach for all patients admitted to typical general medical and rapid

assessment wards such as those in the present study. Furthermore, adoption of a protocol for routine nutritional support for all patients in this group could be implemented as standard ward practice. This could take the form of a combination of protected meal times, assistance with feeding and nutrient dense meal and drink options. Furthermore, education and training of health professionals about the importance of identifying and referring malnourished patients to dietetic staff may also increase referral rates.

In conclusion, the present study illustrates that malnutrition remains a significant problem in elderly hospitalised patients and is poorly recognised, documented and referred on by health professionals. Furthermore, health professionals' knowledge of nutritional risk factors for malnutrition is poor, with evidence of misconceptions regarding the relative importance of significant risk factors such as loss of weight and loss of appetite. Considerable scope exists to develop appropriate education and training materials to enhance health professionals' knowledge of nutritional risk factors of malnutrition. The authors note that there is a need for an internationally accepted definition of adult malnutrition and malnutrition risk to assist in this process. This, in combination with implementation of an appropriate nutrition screening policy and nutrition support protocols, may potentially improve identification and documentation of patients at nutritional risk and increase the likelihood of effective nutrition intervention.

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APPENDIX I

Researcher-designed questionnaire

SVH GENERAL MEDICAL UNIT/MAPU
MALNUTRITION IDENTIFICATION SURVEY

1. Please state your position of responsibility at St. Vincent's Hospital and the number of years since graduation:
   Position:. . . . .
   Number of years experience (please tick box) less than 5 years ☐ 5 or more years ☐

2. Please list under the following headings what factors you perceive are risks for malnutrition?
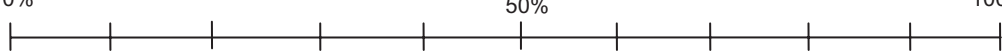
   Medical factors/Co-morbidities: *Lifestyle and social factors:*
   ....
   ....
   ....
   ....

   Psychological factors: *Additional risk factors for hospitalised patients:*
   ....
   ....
   ....
   ....

3. What do you believe are the best indicators of an acute medical patient's nutritional status? Please list in order of importance.
   ....
   ....
   ....
   ....

4. Please state what you believe to be the adverse clinical outcomes/effects associated with poor nutrition/malnutrition:

   Short-term, i.e. *during hospital stay:*   *Long-term,* i.e. *postdischarge:*
   ....
   ....
   ....
   ....

5. Do you currently assess your patients' nutritional status on admission to the general medical wards/MAPU?
   5a. If yes, how would you assess a patient's nutritional status?
   ....
   ....
   ....

   5b. If no, are there particular reasons for this? Please specify.
   ☐ Don't believe it is necessary.
   ☐ Do not have the time to undertake assessment
   ☐ Do not have the appropriate skills
   ☐ It is not part of my job
   ☐ Dietitians automatically see all patients
   ☐ Other···

6. You would be aware of cognitive screening tools, for example the Mini-Mental. Are you aware of any validated nutritional screening tools?   YES/NO
   If yes:
   Please name this/these
   ....
   ....

   Would you be able to perform nutrition screening using this/these validated tools with your current knowledge?
   ....
   ....

7. Please mark on the following scale, what percentage of general medical/MAPU patient admissions you believe are malnourished or are at risk of malnutrition?

   0%   50%   100%
   ├──────┼──────┼──────┼──────┼──────┼──────┼──────┼──────┼──────┼──────┤

8. If you believed a patient was at risk of malnutrition, what would be your next step for their treatment? Do you know what treatment options are available?
   ....
   ....
   ....