

The Malnutrition Screening Tool in Geriatric Rehabilitation: A Comparison of Validity When Completed by Health Professionals With and Without Malnutrition Screening Training Has Implications for Practice



Skye Marshall, PhD, APD*; Adrienne Young, PhD, APD*; Elizabeth Isenring, PhD, AdvAPD[†]

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*APD=Accredited Practising Dietitian (certified in Australia).

[†]AdvAPD=Advanced Accredited Practising Dietitian (certified in Australia).

ABSTRACT

Background The validity of the Malnutrition Screening Tool (MST) in geriatric rehabilitation has been evaluated in a research environment but not in professional practice.

Objective In older adults admitted to rehabilitation, this study was undertaken to compare the MST scoring agreement (inter-rater reliability) between health professionals with and without malnutrition risk and screening training; to evaluate the concurrent validity of the MST completed by the trained and untrained health professionals compared to the International Classification of Diseases, Tenth Revision, Australian Modification using different MST score cutoffs; and to determine whether patient characteristics were associated with MST scoring accuracy when completed by health professionals without malnutrition risk and screening training.

Design This was an observational, cross-sectional study.

Participants/setting Fifty-seven older adults (mean age=79.1±7.3 years) were recruited from August 2013 to February 2014 from two rural rehabilitation units in New South Wales, Australia.

Main outcome measures MST, International Classification of Diseases, Tenth Revision, Australian Modification, classification of malnutrition, and patient characteristics were used to measure outcomes.

Statistical analysis performed Measures of diagnostic accuracy generated from a contingency table, receiver operating characteristic curve, and Spearman's correlation were used.

Results The MST scores completed by health professionals with and without malnutrition risk and screening training showed moderate correlation and fair agreement ($r_s=0.465$; $P=0.001$; $\kappa=0.297$; $P=0.028$). When compared to the International Classification of Diseases, Tenth Revision, Australian Modification, the untrained MST administration showed moderate diagnostic accuracy (sensitivity 56.5%, specificity 83.3%), but increasing the MST score to ≥ 3 caused the sensitivity of both the trained and untrained MST administration to decrease (56.5% and 22.9%, respectively).

Conclusions The application of the MST by health professionals without malnutrition risk and screening training in rehabilitation may not provide sufficient accuracy in identifying patients with malnutrition risk. Using an MST score of ≥ 2 to indicate malnutrition risk is recommended, as increasing the MST cutoff score to ≥ 3 is likely to have insufficient accuracy, even when completed by health professionals with malnutrition risk and screening training. Research evaluating the impact of providing rehabilitation staff with regular and ongoing training in completing malnutrition screening and referral pathways is warranted.

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IN RECOGNITION OF THE HIGH PREVALENCE (45% to 65%) and poor outcomes of older patients with protein-energy malnutrition (herein referred to as “malnutrition”) in sub-acute rehabilitation units,¹⁻³ best-practice guidelines recommend malnutrition screening upon

admission.⁴⁻⁷ In response, screening for nutritional problems upon admission to a health care facility is mandated by the Joint Commission on Accreditation of Healthcare Organizations in the United States.⁸ The Malnutrition Screening Tool (MST) is a nutrition screening tool commonly used at

admission to acute and sub-acute health facilities to evaluate risk of malnutrition and initiate a nutrition care pathway, including referral to a dietitian.^{4,9}

The MST consists of two questions: “Have you/the patient lost weight recently without trying?” (scored 0 to 4), and “Have you/the patient been eating poorly because of a decreased appetite (<3/4 of usual intake and, may also be due to chewing and swallowing problems)?” (scored 0 to 1). Thus, the MST provides a continuous score of 0 to 5, where a score of ≥ 2 indicates risk of malnutrition and need for full nutrition assessment via dietetic referral.¹⁰ The MST is a low-cost and low-burden screening tool, where no physical measurements are required, and can be completed by any person, including the patient for self-assessment. The MST was originally developed in acute-care patients, and has also shown moderate to strong concurrent validity in oncology outpatients, aged-care residents, older hip-fracture acute-care inpatients, and most recently in older rehabilitation patients.^{9,11–18} In these diagnostic accuracy studies, the MST was completed for research purposes by health professionals (ie, dietitians, nurses, nutrition assistants, and public health researchers) who have received education regarding malnutrition and training in malnutrition screening techniques. Therefore, accuracy of tool completion by health professionals in the practice setting, as well as the inter-rater reliability of the tool, is of interest, as poor screening accuracy may have significant negative impacts on patient outcomes as well as costs to the health care facility.¹⁸ Of additional interest in the rehabilitation setting, some facilities will now refer to the dietitian upon an MST score of ≥ 3 , where a patient with a score of 2 is placed on a standardized high-protein, high-energy diet code and monitored by nurses.¹⁹ There has been no evaluation of using an MST score of ≥ 3 to indicate need for a dietetic referral.

Therefore, in older adults admitted to rehabilitation, this study was undertaken to compare the MST scoring agreement (inter-rater reliability) between health professionals with and without malnutrition risk and screening training; to evaluate the concurrent validity of the MST completed by the trained and untrained health professionals compared to the International Classification of Diseases, Tenth Revision, Australian Modification (ICD-10-AM) using different MST score cutoffs; and to determine whether patient characteristics were associated with MST scoring accuracy when completed by untrained health professionals.

MATERIALS AND METHODS

An observational cross-sectional study was undertaken from August 2013 to February 2014 in two publicly funded rural rehabilitation units in New South Wales, Australia. This study was conducted as part of the MARRC (Malnutrition in the Australian Rural Rehabilitation Community) study, registered at the Australian New Zealand Clinical Trials Registry (trial version 2.0, 9 May 2013; ACTRN12613000518763), and received ethical and governance approval (North Coast NSW Human Research Ethics Committee: LNR063, G108). Written informed consent was obtained from all participants and/or their guardians.

Study Sample

The study sample has been described in detail elsewhere.¹³ Briefly, 57 community-dwelling older adults (65 years and

older) were consecutively sampled in two public rehabilitation units in rural New South Wales, Australia.²⁰ The sample size reflects the number of eligible and consenting participants in the recruitment period (consent rate 98%). Participants were recruited if they were admitted with the expectation they would return to the community and had an informal/family caregiver.

Data Collection

All data collection, including a full nutrition assessment, was completed by the primary researcher (an Accredited Practising Dietitian [Australia-certified], referred to as the trained health professional) at bedside (median 2 days after admission), except for the MST completed by nursing staff as part of usual care (referred to as the “untrained MST”). Assessment was informed by medical notes and participant or family caregiver report. The primary researcher obtained weight and height measurements using calibrated scales and a sliding knee-height caliper, which was used to measure the knee height. Knee height was then entered into a population-specific formula to estimate the true height.²¹ Participant characteristics that were used to determine association with the accuracy of the untrained MST were age, sex, marital status, highest level of education attained, living alone, reason for admission (acute/chronic condition), source of admission (acute care/community), dentures, being on a pension, English as first language, ethnicity, religion, body mass index (BMI; calculated as kg/m^2), and BMI weight category (normal BMI for older adults was considered 22 to 27, <22 was considered underweight, and >27 was considered overweight/obese).²²

Nutrition Screening and Assessment

In both units, nursing staff completed the MST during a full “admission assessment,” which also included items related to demographics, care needs, falls risk, and initial care plans. The nurses received no specific training on completion of the MST as part of the study or as part of usual care, and they were blinded to results of how the trained health professional completed the MST (referred to as the “trained MST”). Upon the new appointment of nurses in the rehabilitation units, the nurses received a brief introduction to the MST and dietetics referral pathway, by the clinical nurse educator (site A) or nursing colleagues (site B), which used no standardized screening training or malnutrition education program. At time of data collection, the sampled rehabilitation units were still recommended to refer to the dietitian upon an MST score of ≥ 2 .

The full nutrition assessment completed by the trained health professional was used to inform the trained MST and the ICD-10-AM classification of protein-energy malnutrition.²³ As there is no gold standard for diagnosing malnutrition, the ICD-10-AM criteria were selected as the reference measure to diagnose “malnutrition,” as it is the recognized standard diagnostic criteria for the identification, documentation, and coding of protein-energy malnutrition and is used to provide case-mix funding reimbursements in Australia. The ICD-10-AM considers a patient as malnourished if he or she has a BMI <18.5 or has unintentional weight loss of $\geq 5\%$ with evidence of suboptimal dietary intake as well as evidence of loss of subcutaneous fat and/or muscle.²³ For the

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