Malnutrition in geriatric rehabilitation: prevalence, patient outcomes and criterion validity of the Scored Patient-Generated Subjective Global Assessment (PG-SGA) and the Mini Nutritional Assessment (MNA)

Marshall, Skye; Young, Adrienne M; Bauer, Judith Dorothea; Isenring, Elisabeth

Published: 01/11/2015

Document Version:
Peer reviewed version

Link to publication in Bond University research repository.

Recommended citation (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.
Malnutrition in geriatric rehabilitation
Prevalence, patient outcomes and criterion validity of the Scored Patient-Generated Subjective Global Assessment (PG-SGA) and the Mini Nutritional Assessment (MNA)

Skye Marshall
Dr. Adrienne Young, A/Prof. Judith Bauer, Prof. Elizabeth Isenring
“Food and nutrient intake is unable to meet protein, energy and nutrient requirements over time leading to a disruption of homeostasis in lean tissues, body weight and physical function.”


In malnourished older adults admitted to rehabilitation:

1) Determine the criterion (concurrent and predictive) validity of nutrition assessment tools:
   • Scored Patient-Generated Subjective Global Assessment (PG-SGA)
   • Mini Nutritional Assessment (MNA) in diagnosing malnutrition;

1) Report the prevalence, health and aged care use, and mortality of rural malnourished older adults.
Participants:
- Rehabilitation inpatients in rural NSW
- n=57, 79 years, 49% female
- Live at home usually
- Usual care (0.15FTE dietitian)

Methods of diagnosis at admission
1. ICD-10-AM Classification of malnutrition (yardstick)
2. Scored Patient-Generated Subjective Global Assessment (PG-SGA)
3. Mini Nutritional Assessment (MNA)

Longitudinal outcomes at discharge
1. Discharge location (home/hospital/other)
2. Length of rehabilitation stay

Longitudinal outcomes at 12 weeks post-discharge
1. Admission to residential aged care at 12 weeks post-discharge
2. Mortality at 12 weeks post-discharge
3. Rehospitalisation length of stay at 12 weeks post-discharge
## Methods

| Methods of diagnosis at admission | 1. ICD-10-AM Classification of malnutrition (yardstick)  
2. Scored Patient-Generated Subjective Global Assessment (PG-SGA)  
3. Mini Nutritional Assessment (MNA) |

That’s a lot of acronyms Skye...
Criterion validity:

1) Concurrent validity: compared to accepted standard
   - ICD-10-AM (hospital coding for malnutrition)
   - Sensitivity and specificity (%)  

2) Predictive validity
   - Health and aged care outcomes
   - Significant difference (t-test or chi-squared)

The International Statistical Classification of Diseases and Health Related Problems 10th Revision Australian Modification (sixth edition, ICD-10-AM) classifications for protein-energy malnutrition in adults

<table>
<thead>
<tr>
<th>Classification</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>E43: Unspecified severe protein-energy malnutrition</td>
<td>In adults, BMI &lt;18.5 kg/m² or unintentional loss of weight (≥10%) with evidence of suboptimal intake resulting in severe loss of subcutaneous fat and/or severe muscle wasting</td>
</tr>
<tr>
<td>E44.0: Moderate protein-energy malnutrition</td>
<td>In adults, BMI &lt;18.5 kg/m² or unintentional loss of weight (5-9%) with evidence of suboptimal intake resulting in moderate loss of subcutaneous fat and/or moderate muscle wasting</td>
</tr>
<tr>
<td>E44.1: Mild protein-energy malnutrition</td>
<td>In adults, BMI &lt;18.5 kg/m² or unintentional loss of weight (5-9%) with evidence of suboptimal intake resulting in mild loss of subcutaneous fat and/or mild muscle wasting</td>
</tr>
</tbody>
</table>
Global rating (A, B, C) criterion validity in geriatric rehabilitation patients?

- Sensitivity 100%
- Specificity 87%
- Can predict
  - rehospitalisation LOS ($P=0.005$)
  - admission to RACF ($P=0.008$)
  - discharge location ($P=0.046$)

= STRONG CRITERION VALIDITY

Score ($\geq 7$) criterion validity in geriatric rehabilitation patients?

- Sensitivity 92%
- Specificity 84%
- Can predict
  - rehospitalisation LOS ($P=0.03$)
  - discharge location ($P=0.033$)

= STRONG CRITERION VALIDITY

We recommend for use in geriatric rehabilitation.

The Scored PG-SGA

- Global rating:
  - A = Well-nourished
  - B = Moderately malnourished
  - C = Severely malnourished

- Score: $\geq 9$ in adult oncology patients

- Sensitivity 100%
- Specificity 87%
- Can predict
  - rehospitalisation LOS ($P=0.005$)
  - admission to RACF ($P=0.008$)
  - discharge location ($P=0.046$)

= STRONG CRITERION VALIDITY

- Sensitivity 92%
- Specificity 84%
- Can predict
  - rehospitalisation LOS ($P=0.03$)
  - discharge location ($P=0.033$)

= STRONG CRITERION VALIDITY

We recommend for use in geriatric rehabilitation.
Categories’ criterion validity in geriatric rehabilitation patients?

- Sensitivity 58%
- Specificity 97%
- Can predict
  - rehospitalisation ($P=0.023$)
  - admission to RACF ($P=0.034$)
  - discharge location ($P=0.019$)

MODERATE CRITERION VALIDITY

We recommend to use with caution in geriatric rehabilitation
Prevalence and health outcomes

Malnutrition prevalence was 46% (ICD-10-AM)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Well-nourished (n=31)</th>
<th>Malnourished (n=26)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation LOS(^a) (days), median (IQR(^b))</td>
<td>23.0 (16.0-37.5)</td>
<td>22.0 (13.75-32.75)</td>
<td>NS</td>
</tr>
<tr>
<td>Rehospitalization LOS (days), median (IQR(^c))</td>
<td>4.0 (1.0-14.75)</td>
<td>10.0 (7.0-36.0)</td>
<td>0.032</td>
</tr>
<tr>
<td>Rehospitalization incidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Median (IQR(^c))</td>
<td>2.0 (1.0-2.0)</td>
<td>1.0 (1.0-2.0)</td>
<td>NS</td>
</tr>
<tr>
<td>- Counts (%)</td>
<td>n=12 (38.7%)</td>
<td>n=11 (38.5%)</td>
<td></td>
</tr>
<tr>
<td>Discharge location, counts (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Home</td>
<td>n=27 (87.1%)</td>
<td>n=17 (65.4%)</td>
<td>0.052</td>
</tr>
<tr>
<td>- Other(^e)</td>
<td>n=4 (12.9%)</td>
<td>n=9 (34.6%)</td>
<td></td>
</tr>
<tr>
<td>Admitted to RACF(^f), counts (%)</td>
<td>n=4 (12.9%)</td>
<td>n=7 (26.9%)</td>
<td>NS</td>
</tr>
<tr>
<td>Mortality, counts (%)</td>
<td>n=0</td>
<td>n=3 (11.5%)</td>
<td>0.052</td>
</tr>
</tbody>
</table>
Limitations

- Generalisability
- Limitation in yardstick
- Smallish sample size
- Researcher bias
Malnutrition in geriatric rehabilitation

- Prevalence is too high
- Patients have poor outcomes in the long term
- Scored PG-SGA has strong validity
- MNA has moderate validity
Malnutrition in geriatric rehabilitation: Prevalence, Patient Outcomes, and Criterion Validity of the Scored Patient-Generated Subjective Global Assessment (PS-SGA) and the Mini Nutritional Assessment (MNA)

Swayne Marshall, APD; Adeline Young, PhD, APD; Judith Baum, PhD, APD; Elizabeth Herring, PhD, APD

ARTICLE INFORMATION
Original Research

ABSTRACT
Background: Accurate identification and management of malnutrition is essential to ensure that patient outcomes can be improved and resources used effectively. Objectives: To determine the prevalence, health and age-adjusted care-site mortality rate and criterion validity of the Scored Patient-Generated Subjective Global Assessment (PS-SGA) and the Mini Nutritional Assessment (MNA) in diagnosing malnutrition and to identify the Scored PS-SGA cut-off value associated with malnutrition.

Design: Observational prospective cohort study.

Participants: Residents aged 65 years and over who required long-term residential care and were assigned to a resident aged care facility (n=175). Participants were recruited from two rural health care units in New South Wales, Australia.

Methods: Nutritional assessment using the Scored PS-SGA and MNA was conducted by one trained researcher (Accredited Practising Dietitian) on two facilities in both weeks with seven days of adherence. The Scored PS-SGA findings and MNA score (at 12-month follow-up) were compared with mortality data collected every six months.

Results: The Scored PS-SGA and MNA were strongly correlated with each other. The MNA was found to underestimate malnutrition (Table 1). The Scored PS-SGA was found to be more discriminatory for diagnosing malnutrition than the MNA. The Scored PS-SGA and MNA scores were significantly associated with an increased risk of mortality and hospitalisation with a longer LOS. The Scored PS-SGA was also found to be more accurate at predicting an increased risk of mortality and hospitalisation with a longer LOS.

Conclusions: Malnutrition prevalence in the rural geriatric rehabilitation population is high and associated with increased health and aged care use.

The Scored PS-SGA is suitable for nutrition assessment in geriatric rehabilitation. The MNA may be suitable for nutrition assessment in geriatric rehabilitation, but care needs to be taken to ensure all malnourished patients are identified.

The physiological and psychological consequences of malnutrition are significant and diverse, in health care facilities, malnutrition increases mortality, morbidity, and cost implications. Overall, the prevalence of malnutrition increases healthcare costs and treatment costs and length of stay. Common symptoms of malnutrition, such as confusion, fatigue, and weakness, are often attributed to other conditions, leading to frequent misdiagnosis and underrecognition of malnutrition. There is strong evidence showing malnutrition is under-recognized and under-diagnosed in the rehabilitation setting, despite a high prevalence (20% to 30%). In addition, the prevalence of malnutrition in geriatric rehabilitation is high, and associated with increased health and aged care use. The Scored PS-SGA and MNA scores were significantly associated with an increased risk of mortality and hospitalisation with a longer LOS. The Scored PS-SGA was found to be more discriminatory for diagnosing malnutrition than the MNA. The Scored PS-SGA and MNA scores were significantly associated with an increased risk of mortality and hospitalisation with a longer LOS.