SAFETY IN HEALTH

MEETING ABSTRACT

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Psychometric testing of the "Graz Malnutrition Screening Tool" (GMS) - Validity, Reliability, Sensitivity & Specificity

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Background

Despite high prevalence rates of malnutrition in hospitals, awareness of medical and nursing staff is still rather low [1]. The implementation of valid malnutrition screening tools within preexisting electronic data source systems seems mandatory. Hospitals are in need of an easy to handle, valid and reliable malnutrition screening tool with high sensitivity and specificity for all kind of adult patient groups. The GMS was developed by a multidisciplinary nutrition team of the University Hospital Graz (Austria). It is primarily based on the ESPEN recommendations [2] and consists of five items shown in table 1. To individualize for special needs of older patients, age was introduced as independent risk factor. The aims of this study were to evaluate the prevalence of malnutrition by the GMS in internal, surgical and orthopaedic wards at the University Hospital Graz and to evaluate psychometric properties of the GMS including concurrent validity, inter-rater reliability, sensitivity and specificity.

Materials and methods

A cross-sectional study was conducted. Between December 2013 and April 2014, 404 randomly selected patients admitted to the University Hospital Graz were enrolled into the validation process. To collect valid data from patients of all age, participants were divided into three age groups (18-44; 45-69; 70+). For each patient enrolled, malnutrition was screened in independent and blinded fashion with GMS obtained by two trained dieticians. Additionally Nutritional Risk Screening (NRS) and

Table 1. Items of the Graz Malnutrition Screening Tool (GMS)

Item	Points
1. **Weight loss** within the last 3 months	0 to 2 points
2. **Body Mass Index**	0 to 2 points
3. Changes in **nutritional intake** 3 separate questions: • loss of appetite • nausea/vomiting/diarrhea, • problems with chewing- and/or swallowing	0 to 3 points
4. **Severity of disease**	0 to 2 points
5. **Age**	1 additional point for being ≥ 65 years

MNA-SF for patients older than 70 was conducted. Statistical Analysis was performed using SPSS 20.

Results

According to the GMS 31.9%/28.5% of all admitted patients were categorized as malnourished (depending on rater). According to the reference standard NRS 24.5% suffered from malnutrition. Assuming the NRS as reference standard GMS reaches sensitivity of 90% and specificity of 87%. Pearson's r values of 0.78 according to the NRS and 0.84 according to the MNA-SF for patients older than 70 years show strong positive correlations. Inter-rater-reliability for the total scale was 0.82 (Cohen's kappa) which is considered almost perfect.

Conclusions

To improve patient safety in hospitals, patients with existing malnutrition have to be identified and treated according to evidence based standards. Regarding to psychometric testing, the GMS proves to be a valid and

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reliable malnutrition screening tool for hospitalized adult patients of all disease groups. It further provides increased sensitivity in older patients. GMS has already been introduced in the hospital software used in the province of Styria/Austria and may be technically transferred to different IT-systems.

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References
1. Norman K, Pichard C, Lochs H, Pirlich M: **Prognostic impact of disease-related malnutrition.** *Clin Nutr* 2008, **27**(1):5-15.
2. Kondrup J, Allison SP, Elia M, Vellas B, Plauth M, Educational and Clinical Practice Committee, European Society of Parenteral and Enteral Nutrition (ESPEN): **ESPEN guidelines for nutrition screening 2002.** *Clin Nutr* 2003, **22**(4):415-421.