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Editorial Board

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Subjective Global Assessment (SGA) and Malnutrition Screening Tool (MST) Appropriate Screening Tool in Determining Nutrition Care in Adults and Elderly

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Abstract. Initial identification to find factors related to malnutrition and the risk of under nutrition can be detected by screening. The usual screening tools used in determining nutritional care at dr Soepraoen Hospital in Malang are Subjective Global Assessment (SGA), Nutrition Risk Screening 2002 (NRS-2002), and Malnutrition Screening Tool (MST). However, in the use of these three screening tools are still not found one which is most appropriate. The purpose of this study was to analyze the suitability of the use of all three screening tools. An observational study with a cross-sectional study design with a total of 50 patients. The data collected is characteristic of patient including age, gender and diagnosis. Nutrition screening used under SGA, NRS-2002 and MST. Data collection is done by interview, observation and measurement directly and see patient medical record data. The results showed that 50% of patients included adult age and 50% elderly, 56% women, and 68% were diagnosed with internal medicine. The results of screening based on SGA most of the patients (64%) of patients were identified as malnourished (malnutrition status), according to MST in 60% of patients with malnutrition category, whereas according to NRS-2002 most (68%) were not malnourished. Statistical analysis with Spearman obtained result between SGA, NRS-2002 and MST have a match with value <0,05. Intermediate correlations were found in SGA and MST 0,595, NRS-2002 and MST 0.473, as did SGA and NRS-2002 0.461. The recommended screening tool for use is the MST Modified and SGA tool as it can predict the more appropriate malnutrition especially for adults and elderly who can communicate. A deeper review is needed on the use of NRS-2002 screening tools, as well as skill enhancement in using screening tools to obtain valid results and provide maximum nutritional care.

Keywords : *Subjective Global Assessment* (SGA), *Malnutrition Screening Tool* (MST), *Nutritional care*

1. Introduction

Nutrition screening aims to identify factors related to malnutrition and the risk of malnutrition. Malnutrition that is not handled properly will increase the risk of infection, illness and even death. Nutrition screening should be precise, simple, easy
To interpret and sensitive to be widely used and consistently implemented by non-specialists [1,2].
Criteria for the selection of appropriate tools also include   the   validity   and Reliability of methods, predictive power, Acceptance by patients and nurses, and simplicity of use [3].   The most common methods used to predict or identify malnutrition are nutritional status screening using the Subjective Global Assessment (SGA), Nutrition Risk Screening 2002 (NRS-2002), and Malnutrition Screening Tool (MST), as well as interpretation of biochemical parameters [4,5]. To overcome malnutrition-related illnesses and their consequences, timely identification of nutritional status disorders and rapid response to initiation of treatment are essential for patients, especially in the nutritional risk group [6].
Dr. Soepraoen Hospital is a hospital that is used as a referral hospital in V / Brawijaya Regional Military Region. This Hospital has a 300 bed capacity with 50% Bed Occupation Rate (BOR). Based on standardized nutrition care process guidelines (2014), nutrition screening tool is fast, easy and suitable to use in accordance with the condition of patients treated at Dr. Soepraoen Malang Hospital is MST (Malnutrition Screening Tools) modification done by medical personnel that is nurse.

Currently Dr. Soepraoen Hospital needs to find a new source of reference as a comparison of previous nutritional status assessments. Therefore it is necessary to conduct a study on the assessment of nutritional status using the SGA and NRS-2002 methods, to see which method is most appropriate in detecting the risk of malnutrition in hospitalized patients.

The purpose of this study was to analyze the suitability of the use of Subjective Global Assessment (SGA), Nutrition Risk Screening 2002 (NRS-2002), and Malnutrition Screening Tool (MST) as a screening tool in the determination of nutritional care at Dr. Soepraoen Hospital Malang.

2. Method

This is an observational research with cross-sectional study design. The population in this study was all inpatients classes I, II, and III except the children in the Dr. Soepraoen Malang Hospital. Using Purposive Sampling Subject technique, that is according to criteria: patient aged ≥ 19 years old; conscious and able to communicate; not in an emergency, pregnancy, post partum; and willing and allowed by the family to be subject of research as evidenced by the patient's consent sheet.

3. Result and Discussion

Patient Characteristics

Table 1. Distribution of Patients by Age, Sex, and Diagnosis of Disease.

Characteristics of Patients	Number of Patients	
	n	%
Age (years)		
• 19 - 50	25	50
•> 50	25	50
T0tal	50	100
Sex		
• Man	22	44
• Women	28	56
Total	50	100
Diagnosis of Disease	34	68
• Internal diseases (DM, Ca, Gastritis, GEA, DHF, Hypertension, Heart, Chepalgia)		
• Lungs	6	12
• Kidney	6	12
• Bone	4	8
Total	50	100

Table 1 shows that the age of inpatient patients consisted of productive age (19-50 years) at 50% and elderly (> 50 years) at 50%. Based on the age of the respondents, 50 sampled patients were able to communicate well, although 7 patients (14%) were over 70 years of age. By age, the youngest patient is 20 years old and the oldest patient is 86 years old. The age of 19-49 years is age that belong to adult or productive age, whereas age 50-64 years pertained in middle age or advanced. This aging process will result in the gradual disappearance of body tissue ability to maintain normal structure and function so that it can not survive foreign objects, including disease microorganisms and decreased ability to repair damages suffered. Digestive disease is the most number 3 disease suffered by elderly and mostly suffered by women that is equal to 47.2%. Humans will gradually lose resistance to infection and will increasingly experience metabolic and structural disorders called "degenerative diseases" such as hypertension, atherosclerosis, diabetes mellitus, cancer, stroke and heart failure[7].

The most patients is female that is equal to 56% and 44% male. Characteristics of patients based on the diagnosis of disease show the majority of diseases is the internal disease in which is equal to 68%. Screening assessments based on the three methods of SGA, NRS-2002 and MST are subjective and objective. Subjective assessments of SGA, NRS-2002 and MST are assessing changes in food intake and unexpected BB changes over time. This assessment relies heavily on patient answers given during screening. While objective assessment on each method has a difference that is on SGA, objective assessment is done by giving a score of functional change points of body and stress factors related to the type of patient illness, as well as physical examination by looking at the physical / body of the patient.

Objective assessment of the NRS-2002 method is to assess the patient's BMI, the severity of the disease and the age of the patient, while the MST method used in dr.Soepraoen hospital Malang has an objective assessment that is the addition of scores of patients with special conditions. The addition of the score is given as much as 2 points, special conditions include Diabetes mellitus, Chronic Kidney Diseases with Hemodialysis, Heart, Chronic Heart Disease, Hypertension, Decreased immunity (HIV), CVA, Major surgery (exploratory laparotomy with secretion, urinary tract surgery, gallstones), ICU / PICU patients, SCTP patients with hypoalbumin and anemia, geriatric, Ca with hypoalbumin and anemia, Ca with chemotherapy and burns> 50%. Figure 1 shows the nutritional status of patients based on SGA consisting of no malnutrition of 36% and with malnutrition risk of 64%. Based on SGA in this study it is known that patients who have a risk of malnutrition are mostly patients with DM disease with or without complications, then patients with a medical diagnosis of chronic kidney disease (CKD), patients with digestive disorders as well as lung diseases such as acute bronchitis, tuberculosis and pleural effusion. Various diseases that are high risk of malnutrition are hipermetabolism, DM, impaired kidney function, impaired liver function, gastrointestinal disease, malignancy, anorexia nervosa, anemia, burns, geriatric and chronic diseases. The application of the SGA screening method can be used in: a) all adult and elderly patients who can communicate; b) patients with unacceptable conditions such as DM patients with gangrene in the legs, postoperative patients, cardiac receptor patients, vertigo-dizzy patients standing, and patients unable to stand due to leg fracture [2].
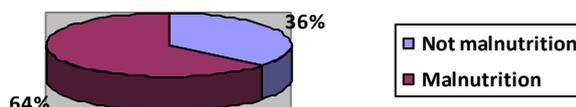
Figure 1. Percentage of Patient Nutrition Status Based on SGA

The SGA method also has constraints if applied to the patient: a) with communication disorders (unable to speak and hear); b) patients with decreased consciousness, such as apathy and somnolence; c) geriatric patients with language disorders and no patient care [8]. Based on Figure 2 it is known that the nutritional status of patients based on NRS-2002 consists of malnutrition and not malnutrition. Most of the patients obtained malnutrition malnutrition status is equal to 68%, and the rest have malnutrition nutritional status of 32%. This is due to nutrient screening there is an assessment of Body Index (BMI) so that the body weight and height of the patient greatly affect the assessment, then the severity or type of disease becomes one of the parameters in determining the score, in addition to the risk of nutritional status associated with loss of BB which is not expected because of the influence of food intake and the age of the patient is also a scalp enhancer in determining the nutritional status of patients with age more than 70 years. NRS-2002 can be used to: a) the patient is conscious, able to communicate well and can mobilize outside the bed; b) patients who can stand and weigh BB /

TB to determine BMI; c) Kidney patients with HD to monitor the development of BB associated with oedeme [2].
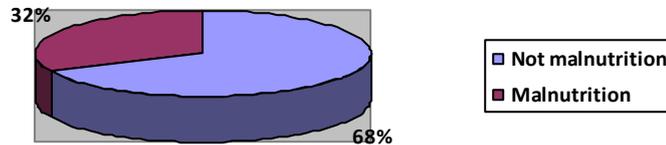
Figure 2. Percentage of Nutritional Status of Patients Based on NRS-2002

However, this NRS-2002 method can not be used for: a) patients with bed rest and non-bias mobilization outside the bed; b) patients with burns> 50% and body parts of the patient, especially the arms and legs so as not to be measured to determine the BB estimation of patients; c) Pediatric patients because there is no BMI cutoff point in children. Based on Figure 3 it can be seen that based on the results of screening by the method of MST obtained 34% of patients with malnutrition category and 66% with category Not Malnutrition. Obtained screening results with malnutrition category is greater than not malnutrition, this is due to the assessment using the form of MST modification, screening contained in RST dr. Soepraoen Malang is subjective and objective. There are 3 questions consisting of 2 subjective There are 3 questions consisting of 2 subjective questions of unexpected changes in food intake and BB and an objective question of the type of patient illness. MST can be used in: a) all adult and elderly patients who can communicate; b) patients with unacceptable conditions such as DM patients with gangrene in the legs, postoperative patients, cardiac receptor patients, vertigo-dizzy patients standing, and patients unabl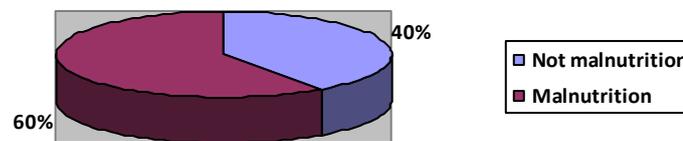e to stand due to leg fracture. The MST method also has constraints if applied to the patient: a) with communication disorders (unable to speak and hear); b) patients with decreased consciousness, such as apathy and somnolence; c) geriatric patients with language disorders and no family accompanying the patient [9].

Figure 3. Percentage of Patient Nutritional Status Based on MST

4. Analysis of Conformity of Results

Table 2. Compliance of screening results based on SGA and MST

SGA	MST				Total
	Not Malnutrition	%	Malnutrition	%	
Not Malnutrition	14	28	4	8	18
Malnutrition	6	12	26	52	32
Total					50

Based on table 2 it can be seen that the results of screening by SGA and MST method there are 80% or as many as 40 patients who have the suitability of the results, while 20%(10 patients) there is no matching results. Furthermore, the statistical test using the Spearman test where obtained a significant value <0.05 which means there is conformity results. The correlation coefficient value obtained for 0,595 which can be concluded has a moderate correlation. Based on the suitability of the results can be interpreted that both methods are SGA and MST can apply in accordance with the needs of hospitals, especially for adult and elderly patients, and can replace each other if one method cannot be applied.

Screening with SGA and MST methods can be applied to the same patient: a) all adult and elderly patients who can communicate; b) patients with unacceptable conditions such as DM patients with gangrene in the legs, postoperative patients, cardiac receptor patients, vertigo-dizzy patients standing, and patients unable to stand due to leg fracture. However, the SGA and MST methods also have constraints if applied to patients: a) with communication disorders (unable to speak and hear); b) patients with decreased consciousness, such as apathy and somnolence; c) geriatric patients with language disorders and no family awaiting patients [5,10].

Table 3. Compliance of screening results based on NRS-2002 and MST

NRS-2002	MST				Total
	Not Malnutrition	%	Malnutrition	%	
Not Malnutrition	19	38	14	28	33
Malnutrition	1	2	16	32	17
Total					50

Based on Table 3 it is known that 70% or as many as 35 patients have a matching outcome, and 30% or as many as 15 patients have unsuitable results. After the statistical test using Spearman got significant value <0,05 and correlation coefficient value equal to 0,473. It can be concluded that there is conformity between NRS-2002 and MST with medium correlation value. This is due to the NRS-2002 method

and MST have subjective and objective characteristics, only different types and quantities of objective questions. If NRS-2002 calculates the patient's IMT value, the severity and age of the patient, then the modified MST applied in RST dr. Soepraoen Malang assesses the type of disease of patients or patients with special conditions to add the score so that it can be concluded patients at risk of malnutrition or not malnutrition[11].

Table 4. Compliance of screening results based on SGA and NRS-2002

SGA	NRS-2002				Total
	Not Malnutrition	%	Malnutrition	%	
Not Malnutrition	16	32	2	4	17
Malnutrition	18	36	14	28	33
Total					50

Based on table 4 it can be seen that 60% or as many as 30 patients have matching screening results based on SGA and NRS-2002, and vice versa 40% or as 20 patients have incompatibility of results.

The result of the test by using Spearman got significant value <0,05 and correlation coefficient value equal to

0,461 which means there is conformity of result with the medium correlation value. This is because there are different assessments for screening, other than that the cut of point assessment that causes different screening results.

There is a significant relationship between the NRS-2002 and SGA methods.

If NRS-2002 is compared to SGA as a gold standard, then NRS-2002 can be recommended for use as a screening tool. NRS-2002 can be used because its assessment is subjective and objective, in which NRS-2002 takes into account IMT assessment, disease severity and patient age. So the results obtained will be more specific according to the condition of the patient.

5. Conclusions

1. Nutrition screening based on Subjective Global Assessment (SGA) mostly (64%) in malnutrition category (less and less). Based on Nutritional Risk Screening 2002 (NRS-2002) most (68%) in the non-malnutrition category. While based on The Malnutrition Screening Tool (MST) mostly (60%) in malnutrition category.
2. There are suitability of screening results of SGA method, NRS-2002 and MST with sign value <0,05, SGA and MST correlation coefficient 0,595; correlation coefficient NRS-2002 and MST 0,473, and correlation coefficient of SGA and NRS-2002 0,461. All three have a moderate correlation.
3. Screening with SGA and MST methods can be applied to the same patient. The NRS-2002 method can be applied to: a) the patient is conscious, able to communicate well and can mobilize outside the bed; b) patients who can stand and weigh BB / TB to determine BMI; c) Kidney patients with HD to monitor the development of BB associated with oedeme. However, this NRS-2002 method can not be used for: a) patients with bed rest and non-bias mobilization outside the bed; b) patients with burn state> 50% and the patient's body parts, especially the arms and legs so cannot be measured to know the BB estimation of patients; c) Pediatric patients because there is no BMI cutoff point in children.

Recommendations

1. The Appropriate screening tool used is MST Modification and SGA because both methods have simple assessment indicators, but can already illustrate the nutritional problems that result in malnutrition.
2. There needs to be a deeper review of the NRS-2002 screening tool so it can be used as an easy screening tool and can be performed by health professionals other than nutritionists.
3. Need improvement of skill in using the nutrition screening tool specially nurse officer, so got the result of valid screening and can give maximum nutritional care as according to requirement of the patient.

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