

Nutritional status of digestive surgery treated in Wahidin Sudirohusodo Hospital, Makassar



Warsinggih^{1*}, Muhammad Faruk², A. Arief Munandar Sinangka²,
Amirullah Abdi², Shandy Shanaya², Maryam Mayidah²,
Ingrid Gloria Mangiwa³, Munaqisah³, Desi Vera Buana³

¹Division of Digestive, Department of Surgery, Faculty of Medicine, Universitas Hasanuddin, Makassar, Indonesia

²Department of Surgery, Faculty of Medicine, Universitas Hasanuddin, Makassar, Indonesia

³Department of Clinical Nutrition, Faculty of Medicine, Universitas Hasanuddin, Makassar, Indonesia

*Corresponding to:

Warsinggih; Division of Digestive, Department of Surgery, Faculty of Medicine, Hasanuddin University Makassar, Indonesia.

Jalan Perintis Kemerdekaan KM 11, Makassar, South Sulawesi, 90245, Indonesia.

Email: kbd.warsinggih@gmail.com

Fax: +62411585984

ORCID ID: <https://orcid.org/0000-0002-1756-9039>

Received: 2023-08-17

Accepted: 2023-10-25

Published: 2023-11-30

ABSTRACT

Introduction: One way to assess nutritional status is to use a more comprehensive subjective global assessment (SGA) format and a structured clinical approach that reflects metabolic and functional changes. Knowing the nutritional status of patients with digestive surgery is essential for comprehensive patient therapy. In this study, we used the SGA assessment to compare the nutritional status of digestive surgery patients treated at the admission and discharge time.

Methods: This research is an observational analytic study with a cross-sectional research design. The population of this study was digestive surgery patients at Dr. Wahidin Sudirohusodo Hospital for the period August-September 2022. Univariate analysis and Wilcoxon test were carried out to compare the nutritional status outcomes at admission and discharge in digestive surgery patients at our institution.

Results: It was found that 101 patients were mainly in the old adult age group (40-59 years) of 46 patients, most of whom were male, the most diagnosed with colorectal cancer, and 81 patients were sent home. Based on SGA at discharge, the most were SGA B with 46 patients, SGA C with 30 patients, and SGA A with 25 patients. The Wilcoxon statistical test was carried out, and statistically, there was no significant difference between the nutritional status at admission and discharge ($p=0.162$).

Conclusion: Malnutrition or nutritional risk was present in a large percentage of hospitalized patients upon admission. These patients' nutritional risk and status remained low upon discharge, highlighting the need for follow-up monitoring and the application of suitable nutrition interventions to enhance patients' quality of life and long-term health outcomes. In general, there was no statistically significant difference between nutritional status assessed by SGA at the time of admission and discharge from the hospital.

Keywords: Digestive Surgery, Nutritional status, Subjective Global Assessment.

Cite this Article: Warsinggih., Faruk, M., Sinangka, A.A.M., Abdi, A., Shanaya, S., Mayidah, M., Mangiwa, I.G., Munaqisah., Buana, D.V. 2023. Nutritional status of digestive surgery treated in Wahidin Sudirohusodo Hospital, Makassar. *IJBS* 17(2): 272-275. DOI: [10.15562/ijbs.v17i2.499](https://doi.org/10.15562/ijbs.v17i2.499)

INTRODUCTION

Nutritional status affects health in general, healing from trauma or surgical procedures, and the incidence of infection and healing of infection. Malnutrition is found in nearly 30% of hospitalized patients and is associated with clinical complications, increased morbidity and mortality, length of stay (LOS), cost of care, and poor quality of life.¹⁻³ Assessment of the initial nutritional status of patients admitted to the hospital is very important. It is done because it can describe the patient's nutritional status at that time and help identify specific nutritional treatments for each patient. Appropriate nutritional therapy will improve clinical

and biochemical indicators so that patients have a better immune system and lower risk of complications.³

Early studies on hospitalized individuals mostly examined their dietary health both before and after admission. However, due to the natural course of the original condition, the influence of the treatment, and other factors, the nutritional status of patients after discharge seldom improves and worsens from that of admission.⁴ Patients' long-term health results and quality of life are adversely impacted if the inadequate nutritional condition is not immediately corrected after discharge. As an example, it would result in postponed chemotherapy and radiation for cancer patients, and it would raise the risk of death

or readmission for the elderly.^{5,6} According to a retrospective study by Charlton et al., over 50% of patients discharged from hospitals in Australia who were 65 years of age or older had malnutrition, and 76% of them were at nutritional risk.⁷

One way to assess nutritional status is to use the subjective global assessment (SGA) score. The SGA score is more comprehensive than anthropometry because it consists of two stages and uses a structured clinical approach, consisting of anamnesis and physical examination that reflect metabolic and functional changes. Anamnesis consists of information about body changes, changes in nutritional intake, gastrointestinal symptoms, impaired functional abilities, and diseases

experienced by the patient.^{1,8,9}

Knowing the nutritional status of patients with digestive surgery is essential for comprehensive patient therapy. Assessment of nutritional status with SGA is carried out to assess the healing and recovery of digestive surgery patients. Thus, in this study, we used the SGA assessment to compare the nutritional status of digestive surgery patients treated at Dr. Wahidin Sudirohusodo Hospital at admission and discharge from the hospital.

METHODS

This research is an observational study with a cross-sectional design that assesses the nutritional status of digestive surgery patients treated at Dr. Wahidin Sudirohusodo Hospital, Makassar, Indonesia between July to August 2022. All research procedures were carried out at our institution using medical record data, assessment, and direct examination of patients. The subject of this study was all digestive surgery patients who met the inclusion and exclusion criteria. The study inclusion criteria included: Digestive Surgery Inpatients. Research exclusion criteria include Patients who did not complete supporting examinations to be included in the study and patients who were lost to follow-up.

Measurement

The age of our study participants was classified according to the Indonesian Ministry of Health, we divided people into three groups: young adults (18-39 years old), adults (40-59), and elderly age (>60 years old).¹⁰ SGA was conducted by the American Society for Parenteral and Enteral Nutrition guidelines.¹¹ The subjects are categorized according to the three major SGA categories determining nutritional status as well-nourished (A), mild to moderately malnourished (B), or severely malnourished (C) based only on subjective consideration of the data collected in the eight areas.^{12,13}

Quality control

The Study Executive Committee, which consists of the lead investigators of each site, discussed the protocol before the study began. Before the study, all staff members received SGA usage training. Online data

collection and assessment were handled by a technical support team. Regular reviews of the online data were conducted throughout the study. As soon as any questionable information was found, site investigators were promptly contacted by phone to validate the findings. All printed clinical study forms were double-entered and logic-checked before data analysis. Along with the site investigators, any suspicious data were examined and verified twice to assure accuracy. All data were locked after confirmation and given to a statistician for statistical analysis.

Statistical analysis

Data were statistically analyzed using SPSS version 22 (IBM SPSS Statistics for Windows, Version 22.0. IBM Corp., Armonk, NY). Data were analyzed by univariate and bivariate. Univariate was

performed to determine the distribution of patient characteristic data. As assessed by SGA, a bivariate analysis with the Wilcoxon statistical test was used to compare nutritional status at admission and discharge. A P-value of less than 0.05 was considered statistically.

RESULTS

Table 1 showed that 101 patients were mainly in the old adult age group (40-59 years) with 46 patients, then elderly (> 60 years) with 23 patients, and young adults (18-39 years) with 32 patients. Based on gender, the majority were male, with 60 patients and 41 female patients. Based on the diagnosis, most were diagnosed with colorectal cancer in 23 patients, then intra-abdominal tumors in 12 patients, and several other diagnoses. Based

Table 1. Characteristics of the patients

Variable	n (%)
Age (years)	
Young Adults (18-39)	32 (31.7)
Old Adult (40-59)	46 (45.5)
Elderly (>60)	23 (22.7)
Sex	
Male	60 (59.4)
Female	41 (40.6)
Diagnosis	
Liver Abscess	4 (4.0)
Psoas Abscess	2 (2.0)
Appendicitis	6 (5.9)
Ascites	6 (5.9)
CKD on CAPD	2 (2.0)
Internal Haemorrhoid	2 (2.0)
Paralytic ileus	2 (2.0)
Intrabdominal Tumor	12 (11.9)
Obstructive Icterus	3 (3.0)
Obstructive ileus	4 (4.0)
Colorectal cancer	23 (22.8)
Cholelithiasis/Cholecystitis	8 (7.9)
Others	21 (20.8)
Gastrointestinal Perforation	6 (5.9)
Outcome	
Discharge	81 (80.2)
Dead	20 (19.8)

Table 2. Comparison of SGA at admission and discharge

SGA	Admission, n (%)	Discharge, n (%)	p-value*
A	21 (20.8)	25 (24.8)	0.162
B	47 (46.5)	46 (45.5)	
C	33 (32.7)	30 (29.7)	

*Wilcoxon test

on discharge status, 81 patients were discharged, and 20 patients died.

Based on **Table 2** based on SGA at admission, the most were found with SGA B of 47 patients, SGA C of 33 patients, and SGA A of 21 patients. Based on SGA at discharge, the most were SGA B with 46 patients, SGA C with 30 patients, and SGA A with 25 patients. The Wilcoxon statistical test was carried out, and statistically, there was no significant difference between the nutritional status at admission and discharge ($p=0.162$).

DISCUSSION

In this observational analytic study, a single institution study, the nutritional status of hospitalized patients was assessed by SGA at admission and discharge. Malnutrition or nutritional risk was present in a large percentage of hospitalized patients upon admission. These patients' nutritional risk and status remained low upon discharge, highlighting the need for follow-up monitoring and the application of suitable nutrition interventions to enhance patients' quality of life and long-term health outcomes.¹⁴ In general, there was no statistically significant difference between nutritional status assessed by SGA at the time of admission and discharge from the hospital.

Malnutrition experienced by sick people is still a big problem for the world of health because it can reduce the body's resistance to prevent, fight, and recover from the disease.¹⁵ Malnutrition in hospitalized patients can cause high morbidity and mortality, prolonged hospitalizations, and increased treatment costs.¹¹ A study conducted at Sardjito Hospital Yogyakarta, Jamil Padang Hospital, and Sanglah Hospital Denpasar, showed that subjects who experienced a decrease in nutritional status from good to moderate, good to bad, and moderate to bad had a significant effect on length of stay.¹⁶ In recent years, various strategies and methods have been developed to evaluate inpatients with nutritional problems.¹⁷⁻¹⁹

In this study, we assessed the nutritional state and risk of the patients both upon admission and discharge. In clinical practice, patients are typically discharged from the hospital after receiving therapy

and having their condition stabilized. However, their nutritional condition might not have improved. For example, patients with gastrointestinal cancer after surgery may have worsening gastrointestinal symptoms upon discharge compared to admission, as well as decreased food intake and an impaired appetite.²⁰ Reduced protein and energy intake has an impact on a patient's nutritional condition after discharge, which can lead to substantial weight loss in elderly patients.²¹ This can have a detrimental effect on quality of life and raise the chance of readmission.^{6,22}

The history of SGA aims to find the etiology of malnutrition, whether it is due to decreased food intake, malabsorption, maldigestion, or increased needs.^{1,8,9} The physical examination assesses loss of muscle and fat mass and the presence of ascites. It helps identify changes in body composition due to the effects of malnutrition or the influence of disease processes. Various studies state that the SGA technique has better sensitivity and specificity than anthropometry.²³⁻²⁵

However, the problem of malnutrition is still difficult to diagnose and is often overlooked by medical teams treating patients. Based on a study conducted in Spain at the time of admission to the hospital, 50% of patients were identified as malnourished as assessed by the Global Subjective Assessment (SGA) method.²⁶

Research conducted at Sardjito Hospital Yogyakarta, Jamil Padang Hospital, and Sanglah Hospital Denpasar found three indicators of nutritional status, the SGA score, Body Mass Index (BMI), and Skinfold Thickness. The minimum sample size is 73 people for groups experiencing decreased nutritional status. Based on the SGA, 74 subjects (28.2%) experienced a decrease in nutritional status during hospitalization, 10 people (3.8%) of whom had a good nutritional status at the time of hospital admission. However, they experienced a decrease in malnutrition status at admission. Subjects who experienced a decrease in nutritional status from good to moderate and moderate to bad were 32 people (12.2%), respectively.¹⁶

According study in Chinese, patients who underwent surgery for gastrointestinal cancer had considerably smaller arm circumferences and body

mass indices (BMI) upon discharge than upon admission, suggesting that their nutritional status was poor.¹¹

The utilization of the SGA score for nutritional risk screening at the time of discharge did not exhibit a direct correlation with clinical outcomes during hospitalization. However, its implementation could serve as a reminder to clinicians to monitor patients' nutritional status post-discharge and offer insights into potential nutritional interventions that could enhance patients' health after discharge. There is a lack of information on the long-term health consequences of patients about nutritional risk and discharge measures. To evaluate the relationship between nutritional risk at discharge and long-term changes in health outcomes, including parameters like the overall quality of life, we intend to build on the current study by conducting additional research and following up with the patients who were at nutritional risk at discharge.

Weaknesses in this study, the sample size still needs to be improved, so it can not describe a large population. Therefore, a large-scale study with a multi-center study is needed to assess the effect of nutrition on patient outcomes for digestive surgery.

CONCLUSION

In this observational analytic study, a single institution study, the nutritional status of hospitalized patients was assessed by SGA at admission and discharge. Malnutrition or nutritional risk was present in a large percentage of hospitalized patients upon admission. These patients' nutritional risk and status remained low upon discharge, highlighting the need for follow-up monitoring and the application of suitable nutrition interventions to enhance patients' quality of life and long-term health outcomes. In general, there was no statistically significant difference between nutritional status assessed by SGA at the time of admission and discharge from the hospital.

ETHICAL STATEMENT

This study was approved by the human research ethics committee at Hasanuddin University (No. 46/UN4.6.4.5.31/PP36/2022) on January 18, 2023.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

FUNDING

No funding or sponsorship.

AUTHOR CONTRIBUTION

WS: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Supervision, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing.

MF: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Supervision, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing.

AAM: Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualization, Writing – review & editing.

AA: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualization, Writing – review & editing.

SS: Project administration, Resources, Software, Validation, Visualization, Writing – review & editing.

MM: Project administration, Resources, Software, Validation, Visualization, Writing – review & editing.

IGM: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing.

MNQ: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing.

DVB: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – original draft, Writing – review & editing.

REFERENCES

1. Meilyana F, Djais J, Garna H. Status gizi berdasarkan subjective global assessment

- sebagai faktor yang mempengaruhi lama perawatan pasien rawat inap anak. *Sari Pediatri*. 2016;12(3):162–7.
- Harimawan AIW, Hadi H, Susetyowati S. Kajian metode Subjective Global Assessment (SGA) dan Nutrition Services Screening Assesment (NSSA) sebagai status gizi awal pasien dewasa sebagai prediktor lama rawat inap dan status pulang. *Jurnal Gizi Klinik Indonesia*; Vol 7, No 3 (2011): Maret. 2011;
 - Adrianto Y, Hustrini N, Kresnawan T, Amelia A, Hidayani F. Hubungan Subjective Global Assessment (SGA) dengan Asupan Energi, Protein, Kekuatan Genggam Tangan, dan Indeks Massa Tubuh pada Pasien Penyakit Ginjal Kronis (PGK) dengan Continuous Ambulatory Peritoneal Dialysis (CAPD). *Jurnal Penyakit Dalam Indonesia*. 2022;8:195.
 - Hung Y-C, Bauer J, Horsley P, Waterhouse M, Bashford J, Isenring E. Changes in nutritional status, body composition, quality of life, and physical activity levels of cancer patients undergoing autologous peripheral blood stem cell transplantation. *Support Care Cancer*. 2013;21(6):1579–86.
 - Starke J, Schneider H, Altheld B, Stehle P, Meier R. Short-term individual nutritional care as part of routine clinical setting improves outcome and quality of life in malnourished medical patients. *Clin Nutr*. 2011;30(2):194–201.
 - Stratton RJ, Hébuterne X, Elia M. A systematic review and meta-analysis of the impact of oral nutritional supplements on hospital readmissions. *Ageing Res Rev*. 2013;12(4):884–97.
 - Charlton KE, Nichols C, Bowden S, Lambert K, Barone L, Mason M, et al. Older rehabilitation patients are at high risk of malnutrition: Evidence from a large Australian database. *Journal of Nutrition, Health and Aging*. 2010;14(8):622–8.
 - Secker DJ, Jeejeebhoy KN. How to perform Subjective Global Nutritional assessment in children. *J Acad Nutr Diet*. 2012;112(3):424–431.e6.
 - Covinsky KE, Martin GE, Beyth RJ, Justice AC, Sehgal AR, Landefeld CS. The Relationship Between Clinical Assessments of Nutritional Status and Adverse Outcomes in Older Hospitalized Medical Patients. *J Am Geriatr Soc*. 1999;47(5):532–8.
 - Karnina R, Rahayu NS, Faruk M. Factors influencing Bromage score in post-spinal anesthesia patients. *Bali Medical Journal*. 2022;11(3 SE-ORIGINAL ARTICLE):1146–50.
 - Zhu M, Wei J, Chen W, Yang X, Cui H, Zhu S. Nutritional Risk and Nutritional Status at Admission and Discharge among Chinese Hospitalized Patients: A Prospective, Nationwide, Multicenter Study. *J Am Coll Nutr*. 2017;36(5):357–63.
 - Reber E, Gomes F, Vasiloglou MF, Schuetz P, Stanga Z. Nutritional Risk Screening and Assessment. *J Clin Med*. 2019;8(7):1065.
 - Prasad N, Sinha A. Subjective Global Assessment (SGA) of Malnutrition. In: *Handbook of Famine, Starvation, and Nutrient Deprivation*. Cham: Springer International Publishing; 2018. p. 1–21.
 - Irianto HP, Putranto AS. Correlation between clinical characteristics of colorectal cancer and nutritional status in patients undergoing surgery. *Bali Medical Journal*. 2023;12(1):1059–62.
 - Dukhi N. Global Prevalence of Malnutrition: Evidence from Literature. In: Imran M, Imran A, editors. *Malnutrition*. Rijeka: IntechOpen; 2020.
 - Budiningsari RD. Pengaruh Perubahan Status Gizi Pasien Dewasa terhadap Lama Rawat Inap dan Biaya Rumah Sakit. *Jurnal Gizi Klinik Indonesia*. 2004;1(1):35.
 - Reber E, Gomes F, Bally L, Schuetz P, Stanga Z. Nutritional Management of Medical Inpatients. *J Clin Med*. 2019;8(8).
 - Gurinović M, Zeković M, Milešević J, Nikolić M, Glibetić MBT-RM in FS. Nutritional Assessment. In Elsevier; 2017.
 - Kesari A, Noel JY. Nutritional Assessment. In *Treasure Island (FL)*; 2023.
 - Beck A, Andersen UT, Leedo E, Jensen LL, Martins K, Quvang M, et al. Does adding a dietician to the liaison team after discharge of geriatric patients improve nutritional outcome: a randomised controlled trial. *Clin Rehabil*. 2015;29(11):1117–28.
 - Kuswardhani T, Sukrawan G, Suastika K. Older Age and Worse Nutritional State Were Related with Impaired Inflammatory Response in Elderly Patients. *Bali Medical Journal*. 2016;5(2):138.
 - Goisser S, Schrader E, Singler K, Bertsch T, Gefeller O, Biber R, et al. Low postoperative dietary intake is associated with worse functional course in geriatric patients up to 6 months after hip fracture. *Br J Nutr*. 2015;113(12):1940–50.
 - Bakshi N, Singh K. Nutrition assessment and its effect on various clinical variables among patients undergoing liver transplant. *Hepatobiliary Surgery and Nutrition*; Vol 5, No 4 (August 01, 2016): Hepatobiliary Surgery and Nutrition (Special Focus on Techniques and Innovations in Liver Surgery). 2016;
 - Paulsen CB, Nielsen BB, Msemu OA, Møller SL, Ekman JR, Theander TG, et al. Anthropometric measurements can identify small for gestational age newborns: a cohort study in rural Tanzania. *BMC Pediatr*. 2019;19(1):120.
 - Mahdavi AM, Ostadrahimi A, Safaiyan A. Subjective global assessment of nutritional status in children. *Matern Child Nutr*. 2010;6(4):374–81.
 - Moriana M, Civera M, Artero A, Real JT, Caro J, Ascaso JF, et al. Validity of subjective global assessment as a screening method for hospital malnutrition. Prevalence of malnutrition in a tertiary hospital. *Endocrinol Nutr*. 2014;61(4):184–9.



This work is licensed under a Creative Commons Attribution