

Effect Of Nutritional Status On The Surgical Patients Using Subjective Global Assessment

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Abstract

Objective: To assess the effects of nutritional status on surgical patients using a Subjective Global Assessment (SGA) scale

Methods: This cross-sectional study was conducted in the Department of General Surgery, PIMS Islamabad from March 2022 to February 2024. All admitted patients in the ward were recruited by convenient sampling during the study period. All demographic data and clinical histories were recorded including SGA category, gender, age, surgical site infection, length of hospital stay and death. SPSS version 23 was used for statistical analysis. Descriptive statistics like mean with standard deviation (SD) and frequency (percentages) were used to analyze the collected data. Inferential statistics were also used for the comparison of study variables according to the SGA category.

Results: A total of 1227 patients were included. The mean age of the patients was 41.98 ± 16.82 years, with 744 (60.6%) males and 483 (39.4%) females. SGA ratings showed that 892 (72.2%) patients fell in category A (well nourished), 333 (27.1%) in B (mild/moderately malnourished), and 02 (0.2%) in C (severely malnourished). The impact of SGA rating on gender distribution and management was non-significant as p-values were $p=0.141$ and $p=0.158$ respectively. The areas where significant impact ($p<0.05$) was seen were surgical site infection, deaths, age and length of hospital stay. An increased number of surgical site infections, longer hospital stays and more deaths were observed in mild/moderately or severely malnourished patients as compared to well-nourished patients.

Conclusion: Malnourished patients have longer duration of hospitalization and those who have undergone surgery have higher wound infection rates.

Keywords: Nutritional status, Surgical Site Infection, Hospital Stay.

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1. Introduction

Malnutrition is characterized as an imbalance in nutrition brought on by an insufficient intake of nutrients or by the inefficient utilization or absorption of the nutrients that have been ingested. This imbalance can lead to changes in body composition, like a decrease in fat-free mass and body cell mass, as well as a reduction in body function, including organ function and muscular performance.¹

In surgical patients, malnutrition is often underdiagnosed and is thought to contribute to worse outcomes during hospitalization after surgery. Malnutrition is one of the most common comorbidities in surgical patients, estimated to impact approximately 50% of adult hospital patients.^{2,3} Malnutrition is a major contributing factor to the development of problems like surgical site infection, delayed wound healing and increased hospital stay.⁴ Unfortunately, hospitalized trauma patients who are malnourished often find it difficult to keep up a normal nutritional condition due to various factors

including inadequate enteral feeding or prolonged nil-by-mouth schedules. Hospitalized patients have a reported prevalence of malnutrition ranging from 10% to 50% which has been associated with higher rates of complications and death following abdominal procedures in general surgery literature.⁵

According to WHO, malnutrition is the biggest hazard to public health worldwide. Recent research indicates that nutritional screening and surgical procedures are significantly interrelated factors in contemporary surgical care. Lower oral meal consumption before surgery is a frequent cause of malnutrition.^{6,7} In Asia, the occurrence of malnutrition in hospitals ranges from 27% to 39%, with a higher frequency observed in older persons (88%) and surgical patients (56%).⁸ Surgery is itself a significant source of stress that triggers many inflammatory and catabolic pathways in humans. Optimal nutrition enables the body to respond effectively to this stressor and recover more quickly and efficiently. Conversely, malnutrition is associated with a poorer surgical outcome and a higher incidence of comorbidities and mortality.⁹

Despite the clinical and economic consequences of malnutrition, there is a widespread lack of knowledge regarding this issue. Conducting nutritional assessment and therapy for patients is essential to decrease their morbidity and mortality rates, as well as to minimize hospital expenses and length of stay. Various instruments are employed for evaluating nutritional status, and while there is no universally accepted assessment approach, SGA (Subjective Global Assessment) is indicated for predicting clinical outcomes.¹⁰

Presently, the majority of countries recognize that hospital malnutrition is a significant issue. However, there is a lack of studies examining how nutritional status can affect surgical patients using Subjective Global Assessment in Asian countries including Pakistan. The objectives of this study were to assess the nutritional condition of patients admitted to a surgical ward and examine the potential association between malnutrition and surgical outcomes.

2. Materials & Methods

An observational cross-sectional study was conducted in the Department of General Surgery, PIMS Islamabad from March 2022 to February 2024, after getting approval from the hospital ethical committee (FMTI/ERRB/06/09, dated 15th March 2022). Non-probability convenient sampling technique was used to include patients during the study period.

All patients >13 years old who consented to participate and were admitted to the surgical ward for treatment were included in the study. The exclusion criteria excluded patients who did not consent and whose data set was incomplete.

All demographic data and complete detailed clinical histories of the patients were recorded. The data on SGA category, gender, age, surgical site infection, length of hospital stay and deaths was noted, collected, and analyzed using SPSS version 25. Descriptive statistics like mean with standard deviation (SD) and frequency (percentages) were used for the analysis of the collected data. Inferential statistics were also used for the comparison of study variables according to the SGA category.

3. Results

A total of 1227 patients were enrolled with a mean age of 41.98 ± 16.82 years in the study. There were 744(60.6%) males and 483(39.4%) females. According to SGA, out of 1227, 892(72.2%) patients were well-nourished followed by 333(27.1%) were mild or moderately malnourished, and only 02(0.2%) were severely malnourished. Post-operative, 135(11.0%) patients developed surgical site infection, the mean hospital stay was 3.92 ± 1.66 days, and 23(1.9%) patients died. (Table 1)

Table 1: Frequency distribution and descriptive statistics of study variables (n=1227)

Variables	Frequency	Per cent
SGA Rating	A (well-nourished)	892
	B (mild/moderately malnourished)	333
	C (severely malnourished)	2
Gender	Male	744
	Female	483
Management	Surgical	1009
	Conservative	218
Surgical site infection	Yes	135
	No	1092
Expiry	Yes	23
	No	1204

The impact of SGA rating on gender distribution and management (surgical vs conservative) was non-significant as the p-values were 0.141 and 0.158 respectively. While the impact was significant ($p < 0.05$) in surgical site infection, deaths, age and length of hospital stay. (Table 2) Surgical site infection, length of hospital stay, and death had a higher incidence in mild/moderately or severely malnourished patients as compared to well-nourished patients. (Figure 1)

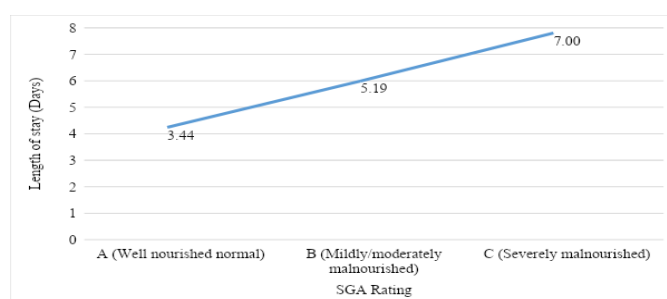


Figure 1: Line graph of the relationship between SGA Rating and length of hospital stay

Table 2: Impact of SGA rating on different study variables

Variables		SGA Rating			Total	p-value
		A (well-nourished)	B (mild/ moderately malnourished)	C (severely malnourished)		
Gender	Male	528	214	2	744	0.141
		59.2%	64.3%	100.0%	60.6%	
	Female	364	119	0	483	
		40.8%	35.7%	0.0%	39.4%	
Management	Surgical	744	263	2	1009	0.158
		83.4%	79.0%	100.0%	82.2%	
	Conservative	148	70	0	218	
		16.6%	21.0%	0.0%	17.8%	
Surgical site infection	Yes	61	73	1	135	0.0001
		6.8%	21.9%	50.0%	11.0%	
	No	831	260	1	1092	
		93.2%	78.1%	50.0%	89.0%	
Expiry	Yes	3	19	1	23	0.0001
		.3%	5.7%	50.0%	1.9%	
	No	889	314	1	1204	
		99.7%	94.3%	50.0%	98.1%	
Age (Years)		39.44±15.81	48.74±17.60	45.00±19.80	41.98±16.82	0.0001
Length of stay (Days)		3.44±1.53	5.19±1.28	7.00±1.41	3.92±1.66	0.0001

4. Discussion

Malnutrition, a prevalent condition in hospitals, arises from inadequate or imbalanced nutritional intake about the body's needs. Malnutrition also results in negative consequences for the patients and elevated healthcare expenses; as a result, protocols for nutritional screening and evaluation have been devised. Multiple studies have provided evidence that SGA is capable of identifying the risks of poor outcomes linked with malnutrition. Consequently, our study employed SGA as a method for nutritional evaluation.¹¹

In this study, the prevalence of malnutrition was found to be 27.3%, which is lower than the prevalence reported in the study conducted by Pham NV et al, which was 56%.¹² Another study of Singapore, revealed that the rate of malnutrition was 15%.¹³ This suggests that differences in the identification of malnutrition may arise from the utilization of distinct nutritional evaluation techniques and the specific hospital departments where patients are admitted.

Malnourished patients have a hospital stay that is 1.5-1.7 times longer than non-malnourished patients.¹⁴ This study showed the same impact of malnutrition on hospital stays. The mean hospital stay in this study in well-nourished patients was 3.44±1.53 days, while in mild/moderately malnourished patients it was 5.19±1.28 days, and in severely malnourished patients it was

7.00±1.41 days, with a significant p-value of p=0.0001. The results of the study by Subwongcharoen et al found similar findings to our study, which was 8 days for malnourished vs 6 days for well-nourished (p < 0.001).¹⁵ The PREDyCES study revealed that patients who are malnourished upon admission experience a considerably longer duration of hospitalization compared to those who are not (11.5 ± 7.5 days vs 8.5 ± 5.8 days, p < 0.001).¹⁶ This aligns with the results of our study. The variation in the duration of hospitalization resulted in increased expenses related to patients who were malnourished upon admission.

We found surgical site infection in well-nourished patients was 6.8%, in mild/moderately malnourished patients was 21.9%, and in severely malnourished patients was 50.0% with a significant p-value (p=0.0001). In a study by Ali et al, surgical site infection was found in 41% of well-nourished patients, and 59% of malnourished patients, with a similarly significant p-value (p=0.001).⁶

Each year, numerous deaths result from diverse surgical procedures, making surgery a significant source of stress and dread for patients. A nationwide survey conducted in the US revealed that the occurrence of surgical fatalities differed among various institutions. This suggests that certain institutions are more adept at managing disease outcomes than others.¹⁷

This study suggests that patients who consumed a greater amount of energy-dense meals and proteins underwent faster recovery compared to other patients. In addition, they experienced a limited number of problems, a shorter duration of hospitalization, and an enhancement in their general state of health. Only a limited amount of research has examined the effects of nutritional needs and their influence on the health of patients who have had surgery. Patients who were consuming nutritional supplements successfully decreased their postoperative problems.

Ali et al, also stated that patients should be closely monitored for their nutritional status after surgery for a specified period to minimize complications and facilitate a quicker return to work.⁶ Hogan et al, found that malnutrition is linked to longer hospital stays, higher rates of readmission to the intensive care unit, and lower quality of life after surgery.¹⁸

There were however some constraints in this study. To ensure a more dependable interpretation of the results, it is advisable to conduct a study of a multicentric design that has high precision and accuracy. A significant constraint of our study was the nutritional evaluation tool, as the SGA method has inherent limitations as a benchmark assessment tool. A solitary examiner conducted the nutrition assessment to exclude any variations caused by different observers. An inherent impediment of SGA is its limited capacity to classify individuals into only three overarching categories, failing to disclose nuanced distinctions in nutritional status. The findings were restricted to a solitary tertiary care facility and may not apply to various contexts. Therefore, it is not possible to integrate it into a broader population. Additional long-term studies should be undertaken to evaluate the same issues regarding nutritional status and its impact on outcomes in surgical patients, utilizing the SGA as a screening tool.

5. Conclusion

Malnutrition is a significant issue among patients who are admitted to the hospital and is linked to higher rates of illness, death, increased expenses, and longer hospital stays. Therefore, it is imperative to assess the nutritional status of persons who are hospitalized. In this study, we evaluated nutritional status and its impact on outcomes in surgical patients using SGA as a screening tool. According to the results of this study, it can be inferred that malnutrition greatly enhances the likelihood of

experiencing problems such as wound infection, length of hospital stay and mortality.

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Contributions:

T.A.M.M, S.H.W - Conception of study

- Experimentation/Study Conduction

T.A.M.M, F.A, K.F, M.A, F.S, S.H.W -

Analysis/Interpretation/Discussion

T.A.M.M, K.F, M.A, F.S, S.H.W - Manuscript Writing

F.A, S.H.W - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

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