Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/s11x9833

PREVALENCE OF MALNUTRITION IN HOSPITALIZED PATIENTS: A COMPREHENSIVE ANALYSIS OF RISK FACTORS, CLINICAL OUTCOMES AND HEALTHCARE IMPLICATIONS

Bherulal[1]*, Mahmood Riaz Mangi [2], Bilal Khan [3], Zahid Ali Mirani [4], Jamil Ahmed[5], Partab Puri[6], Agha saghar fazlani[7], Simrat Mohan [8], Asma Anwar[9]

[1*]Nutrition Officer, Sir C J Institute of Psychiatry, Hyderabad, Pakistan
[2]Medical superintendent , Taluka Hospital Garhi khairo, District jacobabad,Pakistan
[3]Medical Officer, Government of Sindh, Health department Dadu, Pakistan
[4]Senior Medical Officer , Surgical ICU ,Dr.Ruth. K.M. Pfau, Civil Hospital, Karachi, Pakistan
[5] Medical officer, Landhi Hospital Sessi , Karachi, Pakistan
[6] Assistant Professor ,Community Medicine, Muhammad Medical College, Mirpurkhas, Pakistan
[7]Nutrition Officer, Aga khan rural support programme ,Thatta ,Sindh, Pakistan
[8]Lecturer, Hamdard university dental hospital, Karachi, Pakistan
[9]Postgraduate trainee, Zia uddin medical university,Karachi, Pakistan

[*]**Corresponding Author:** Bherulal
*E-mail: (bherulal@hotmail.com)

ABSTRACT

Background Hospital malnutrition is a significant concern in Pakistan, affecting patient outcomes and healthcare systems. It affects 20-50% of hospitalized patients and hospital diets may contribute to this issue. **Objective** This study aimed to determine the prevalence of malnutrition in a hospital and its impact on patient outcomes. **Study place and duration** :The study was conducted at Jinnah post graduate medical centre from July 2024-December 2024.**Methodology** A cross-sectional study assessing nutritional status using Subjective Global Assessment (SGA), anthropometry and biochemical parameters. Patient outcomes, including length of stay, mortality rate and readmissions were also evaluated. **Results**: The study included 181 patients with a median age of 71.6 years and 51.2% were women. According to Subjective Global Assessment (SGA) results, 37.8% were well-nourished, 50.2% were at nutritional risk and 11.9% were malnourished. Malnutrition prevalence was higher in oncology-hematology and medical wards (80.0% and 70.5%) compared to surgical wards (52.4%). Poor nutritional status was associated with longer hospital stays. **Conclusion:** The prevalence of malnutrition in the hospital was high, particularly in medical services, and doubled the length of stay.

Keywords: Malnutrition, nutritional Assessment, patient outcomes, Subjective global assessment (SGA), nutritional status.

INTRODUCTION

Hospital malnutrition is a significant and complex issue that affects patient outcomes and healthcare systems worldwide[1,2]. The prevalence of malnutrition in hospitals is alarmingly high and is often associated with poor health outcomes, increased morbidity ,mortality and prolonged hospital stays.

Factors contributing to hospital malnutrition include inadequate nutritional assessment, poor dietary quality and limited access to nutrition support services[3]. Older adults, patients with chronic diseases and those undergoing surgery or chemotherapy are particularly vulnerable to malnutrition. Effective strategies to address hospital malnutrition involve implementing standardized nutritional assessment tools, such as the Subjective Global Assessment (SGA) and providing tailored nutrition interventions to improve patient outcomes and reduce healthcare costs[4,5]. By prioritizing nutritional care and implementing evidence-based practices, healthcare providers can mitigate the adverse effects of malnutrition and improve the overall quality of care for hospitalized patients[6].

A research found that hospital malnutrition is a significant concern, with studies indicating that a substantial proportion of hospitalized patients are at risk of malnutrition or are already malnourished[7]. According to various studies, between 20-50% of hospitalized patients are malnourished, and this prevalence can be even higher in certain patient populations, such as older adults, those with chronic diseases or patients undergoing surgery[8,9]. A study published in the Journal of the Academy of Nutrition and Dietetics found that malnourished patients had a 30% higher risk of mortality and a 40% longer length of stay compared to well-nourished patients. Another study published in the European Journal of Clinical Nutrition found that malnutrition was associated with increased healthcare costs, with malnourished patients incurring an average of $10,000 more in costs per stay compared to well-nourished patients[10,11]. These findings highlighted the importance of prioritizing nutritional care in hospital settings to prevent and treat malnutrition, and ultimately improve patient outcomes.

Research has consistently shown that hospitalized patients, particularly those at nutritional risk, often fail to meet their energy and protein needs, with studies indicating that only a small percentage (around 31%) of patients consuming hospital food achieve adequate nutrition[12]. This is concerning, as decreased food intake has been linked to increased mortality, as demonstrated by the Nutrition Day survey. Malnutrition has far-reaching consequences including increased morbidity and mortality, longer hospital stays, impaired wound ,fracture healing and heightened risk of postoperative complications such as nosocomial infections, acute renal failure, respiratory failure[13,14]. Furthermore, malnutrition can lead to prolonged mechanical ventilation and intensive care stays[15].

Our study aimed to investigate the prevalence of hospital malnutrition among patients receiving nutritionally complete menus with a specific focus on understanding the relationship between malnutrition and patient outcomes including length of stay and complications. We sought to examine the impact of malnutrition across various hospital services, recognizing that different patient populations may be at varying levels of risk. By shedding light on the scope and consequences of hospital malnutrition, our goal was to inform the development of targeted interventions aimed at improving patient outcomes.Our findings would provide valuable insights into the complex interplay between malnutrition, patient characteristics and hospital outcomes ultimately contributing to the development of more effective strategies for identifying and addressing malnutrition in hospital settings. By doing so, we aim to enhance the quality of care provided to patients and reduce the risk of adverse outcomes associated with malnutrition.

OBJECTIVE OF STUDY

This study investigated the prevalence of hospital malnutrition among patients receiving nutritionally complete menus during hospitalization. Specifically, the study sought to determine the relationship between malnutrition and two key patient outcomes: length of stay and postoperative complications. By examining the association between malnutrition and these outcomes, the study aimed to provide insights into the impact of malnutrition on patient care and healthcare resource utilization.

METHODOLOGY

This cross sectional study was conducted at Jinnah post graduate medical centre from July 2024-December 2024 .A sample size of 181 patients was calculated based on an estimated malnutrition prevalence of 64% and a precision of 7% following a pilot study. Eligible patients included adults of both genders who had been hospitalized for at least 24 hours and were receiving a standard hospital diet (1400-2500 kcal, 58-117g protein). Patients were excluded if they were pregnant, hospitalized for weight loss, had eating disorders or did not meet the study criteria. Patients were recruited from hospital wards with 10-15 patients per ward and were informed about the study's characteristics and voluntary nature by the principal investigator. All patients provided written informed consent before participating in the study.

All patients underwent a comprehensive nutritional assessment using the Subjective Global Assessment (SGA) tool along with anthropometric measurements taken at the bedside. Patients were weighed using a digital scale .Height was estimated by measuring ulnar distance using a flexible tape. Muscle strength was assessed with the patient seated and using their non-dominant arm, taking the maximum value of three consecutive measurements[16]. These assessments were performed once at the time of patient inclusion in the study.

Following the physical assessment, we reviewed patients' medical records to collect blood sample data from the 48 hours preceding study inclusion, gathering nutritional biochemical parameters such as total protein, albumin, total cholesterol and lymphocytes, if previously requested by the patient's physician. We also collected data on complications during admission, including length of stay, mortality rate, readmissions from hospital discharge reports and medical records. Additionally, hospital wards were categorized into five groups: medical (including cardiology, internal medicine, and others), general surgery, orthopedics, other surgeries (such as cardiac, neurosurgery, and urology) and oncology-hematology.

Ethical considerations

The study was approved by the institutional Review board of Jinnah post graduate medical centre

Statistical analysis

The study's data analysis was performed using SPSS version 22.The analysis involved quantitative variables with normal distributions were expressed as mean and standard deviation (SD) and compared using ANOVA for multiple group comparisons. Non-normally distributed variables were summarized as median with interquartile range (IQR) and compared using Mann-Whitney or Kruskal-Wallis. The Wilcoxon test was used for paired comparisons of medians. Categorical variables were presented as percentages and compared using the chi-squared test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study assessed the nutritional status of 201 patients, revealed a median age of 71.6 years with a slight predominance of females (51.2%). The evaluation of nutritional status using the Subjective Global Assessment tool categorized 37.8% of patients as well-nourished, 50.2% as being at nutritional risk and 11.9% as malnourished. The prevalence of malnutrition and nutritional risk exhibited notable variations, with increased frequencies observed among male patients, individuals older than the median age and those hospitalized for conditions such as constitutional symptoms, infections or cancer.

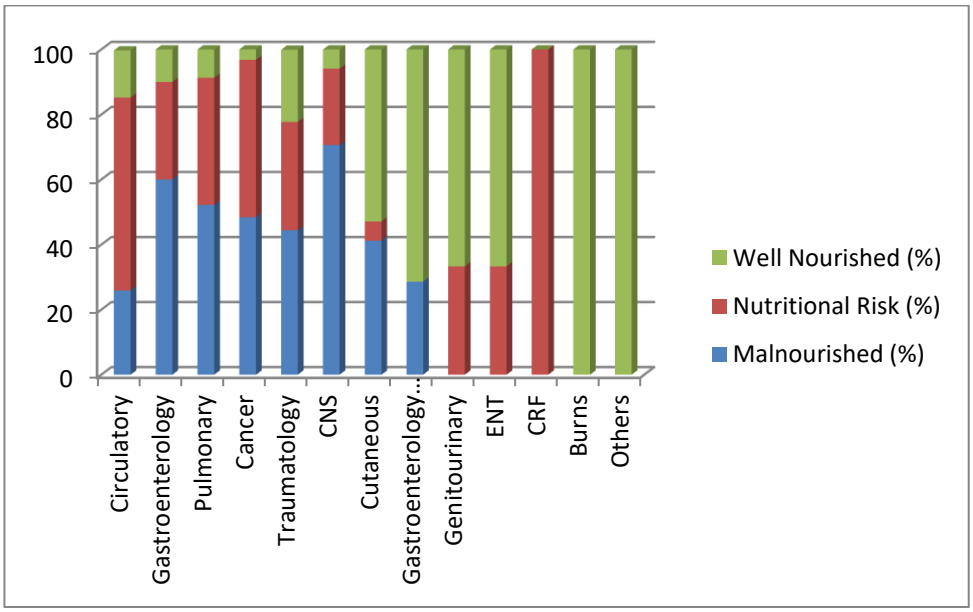

Fig. 1:Nutritional status by principal diagnosis

Furthermore, a significant correlation was found between nutritional status and length of hospital stay with malnourished patients experiencing the longest stays (median of 18.5 days), followed by those at nutritional risk (median of 12 days), and well-nourished patients (median of 8 days).

Table 1 :Nutritional status by regrouped hospitalized services.

Specialty	Well Nourished (%)	Nutritional Risk (%)	Malnourished (%)
Medical	29.5	60.3	10.3
Gastroenterology Surgery	51.4	37.1	11.4
Traumatology	42.1	47.4	10.5
Other Surgeries	46.9	44.9	8.2
Oncology-Hematology	20.0	50.0	30.0

Table 2 :Evaluation of anthropometric and biochemical parameters according to nutritional status.

	n	Total	Well Nourished	Nutritional Risk	Malnourished	P value
Usual weight (kg)	191	71.49 (SD 14.17)	73.00 (SD 14.74)	70.76 (SD 14.17)	69.63 (SD 12.40)	**0.476**
Current weight (kg)	179	68.59 (SD 13.98)	73.62 (SD 14.05)	67.05 (SD 12.59)	58.24 (SD 12.52)	**< 0.001***
Weight loss (%)	179	2.86 (IQR 8.09)	0.26 (IQR 3.71)	-5.40 (IQR 5.61)	-15.26 (IQR 12.72)	**< 0.001***
Ulnar distance (cm)	199	24.05 (SD 1.90)	24.14 (SD 1.94)	23.97 (SD 1.88)	24.06 (IQR 1.93)	**0.854**
Height (cm)	199	161.46 (SD 8.00)	161.43 (SD 8.04)	161.16 (SD 7.94)	161.46 (SD7.64)	**0.881**
BMI (kg/m2)	177	26.28 (SD 5.10)	28.05 (SD 5.16)	25.76 (SD 4.60)	22.24 (SD 4.12)	**< 0.001***
Dinamometry (kg)	198	21.75 (SD 11.24)	23.98 (SD 10.81)	20.81 (SD 11.48)	18.63 (SD 10.69)	**0.063**
Muscle mass (%)	112	31.46 (SD 5.46)	30.74 (SD 5.34)	31.52 (SD 5.61)	34.13 (SD 4.84)	**0.156**
Fat mass (%)	112	28.54 (SD 9.67)	31.34 (SD 8.41)	27.62 (SD 10.37)	21.07 (SD 6.77)	**0.002***
Total proteins (mg/dL)	147	6.20 (SD 0.82)	6.28 (SD 0.76)	6.19 (SD 0.86)	6.08 (0.80)	**0.643**
Albumin (mg/dL)	113	3.63 (SD 0.69)	3.94 (SD 0.54)	3.57 (SD 0.67)	3.26 (0.84)	**0.003***
Cholesterol (mg/dL)	114	157.00 (IQR 51.02)	166.00 (IQR 67.00)	156 (IQR 49.99)	155 (IQR 48.50)	**0.756**
Lymphocytes (cel/ml)	**179**	**1400.00 (IQR 900.00)**	**1300 (IQR 1400)**	**1400 (IQR 1000)**	**1600 (IQR 650)**	**0.392**

* Statistically significant difference.

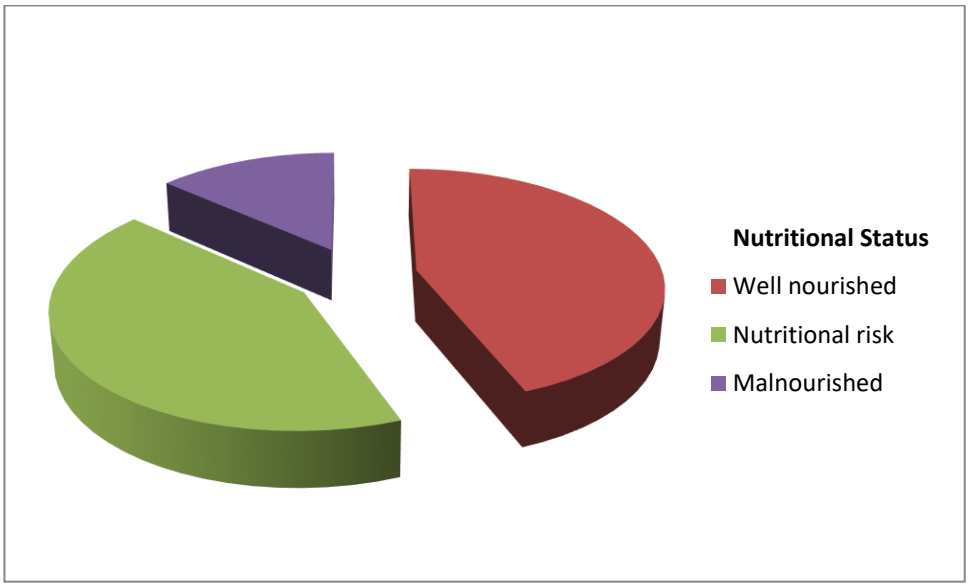

Fig. 2: Prevalence of malnutrition by elapsed time since hospitalization

The study also highlighted service-specific differences, with medical and oncology-hematology services demonstrating higher rates of malnutrition and nutritional risk compared to surgical services. These findings underscore the importance of timely and targeted nutritional interventions to mitigate the adverse consequences of malnutrition and optimize patient outcomes.

DISCUSSION

The high prevalence of malnutrition among hospitalized patients who receive nutritionally complete menus is a concerning phenomenon[17]. At first glance, it may seem counterintuitive that patients who are provided with adequate energy and protein through their hospital diets would still experience malnutrition. However, this finding highlights the complex nature of malnutrition in healthcare settings. Despite the provision of standard hospital diets, various factors can contribute to malnutrition including inadequate nutrient absorption, increased energy expenditure due to illness or stress and the presence of underlying health conditions that affect nutritional status. Furthermore, the quality and quantity of food actually consumed by patients can vary significantly and factors such as meal skipping, food a versions or unappealing meal presentation can also play a role[18,19]. As a result, simply providing a nutritionally complete menu may not be sufficient to prevent malnutrition in hospitalized patients and a more comprehensive approach to nutritional care may be needed[20]. Surgical patients particularly those undergoing gastrointestinal surgery, often experience periods of fasting, receive artificial nutritional support or are on incomplete diets during their transition to a normal diet[21,22]. As a result, surgical patients at higher risk of malnutrition may not have been adequately represented in this study.

Research has highlighted the need for education on nutritional topics among surgical staff to address this issue[23,24]. In terms of diagnoses, patients with tumor processes, respiratory, circulatory and digestive conditions showed a higher prevalence of malnutrition, although the differences were not statistically significant. These findings are consistent with existing literature, which identifies advanced age, male sex and certain diseases like cancer as determinants of malnutrition. Furthermore, patients who remained hospitalized for more than 48 hours had a higher prevalence of malnutrition, suggesting that longer hospital stays may exacerbate nutritional issues. A study found that the prevalence of malnutrition increased significantly with longer hospital stays. Patients receiving a nutritionally complete menu within the first 24 hours of admission tended to have a better nutritional profile, likely due to factors such as shorter lengths of stay, benign diagnoses and less aggressive treatment[25]. The length of stay was strongly associated with the patient's nutritional status, consistent with existing literature. Compared to the study, our study

showed a slightly longer average length of stay for malnourished patients (17 days vs 11.7 days), which may be attributed to the higher prevalence of malnutrition in our study. Notably, research by Somanchi et al. demonstrated that nutritional intervention from admission can reduce length of stay particularly in patients with severe malnutrition, highlighting the potential cost-saving benefits of early nutritional support[26]. The recording of complications during hospitali- zation was very limited as only 25% of the reports reflected mechanical, infectious or surgical complications. This is an important limitation of the study because it does not allow to be reflected the relationship between malnutrition and clinical complications of the patient, as would have been desirable. This may be due to the low priority given to any of them and, in most cases especially surgical patients. Regarding the 30 days readmission rate, the differences, according to nutritional status observed in previous research [27,28] have not been found in the current study. Finally, the death rate was low (1.5%) and not related to nutritional status, as in other studies although it was more common in cancer and hematological patients.

In summary, the prevalence of hospital malnutrition in patients receiving a complete nutritional menu is high. The hospitalized patient at nutritional risk or malnourished is usually a male, elderly, hospitalized in a medical service and suffering from a tumor. Hospital length of stay is increased as nutritional status worsens which may indicate that the clinical situation is compromised, although not able to justify the regis- tration of complications.

This study investigated the prevalence of malnutrition in a specific group of patients who would theoretically be at lower risk due to receiving standard hospital diets. Our results showed a higher prevalence of malnutrition compared to other national and international studies. We found that men and older patients had a higher prevalence of malnutrition than women and younger patients. Additionally, medical patients had a higher rate of malnutrition overall, although patients in Oncology and Hematology wards also had high rates. Notably, our findings differed from some other studies, which have reported higher rates of malnutrition in surgical patients, possibly due to our specific inclusion criteria.

CONCLUSION

This study highlighted the significance of hospital malnutrition among patients receiving nutritionally complete menus, revealing a substantial prevalence and association with adverse patient outcomes. The findings demonstrate that malnutrition is linked to longer hospital stays and increased postoperative complications, underscoring the need for effective nutritional care strategies. By understanding the impact of malnutrition on patient care and healthcare resource utilization, healthcare providers can develop targeted interventions to improve nutritional support and reduce the risk of adverse outcomes, ultimately enhancing the quality of care for hospitalized patients.

REFRENCES

1. Edington J, et al. (2020). Prevalence of malnutrition on admission to four hospitals in England. Clinical Nutrition, 19, 191-195.
2. Naber TH, et al. (2019). Prevalence of malnutrition in nonsurgical hospitalized patients and its association with disease complications. American Journal of Clinical Nutrition, 66(5), 1232-1239.
3. Korfali G, et al. (2019). Nutritional risk of hospitalized patients in Turkey. Clinical Nutrition, 28, 533-537.
4. Sorensen J, et al. (2018). EuroOOPS: An international, multicentre study to implement nutritional risk screening and evaluate clinical outcome. Clinical Nutrition, 27, 340-349.
5. Giryes S, et al. (2020). Measuring Nutrition risk in hospitalized patients: MENU, a hospital-based prevalence survey. Israel Medical Association Journal, 14(7), 405-409.
6. Pirlich M, et al. (2022). The German hospital malnutrition study. Clinical Nutrition, 25(4), 563-572.

7. Norman K, et al. (2024). Prognostic impact of disease-related malnutrition. Clinical Nutrition, 27, 5-15.
8. Pérez de la Cruz A, et al. (2020). Malnutrition in hospitalized patients: prevalence and economic impact. Medicina Clínica (Barcelona), 123, 201-206.
9. Sánchez López AM, et al. (2018). Prevalence of malnutrition in patients admitted to a rehabilitation and traumatology hospital. Nutrición Hospitalaria, 20, 121-130.
10. Gómez Ramos MJ, et al. (2019). Study of nutritional status in hospitalized elderly population. Nutrición Hospitalaria, 20, 286-292.
11. De Luis D, López Guzmán A. (2021). Nutritional status of adult patients admitted to internal medicine departments in public hospitals in Castilla y León, Spain- A multi-center study. European Journal of Internal Medicine, 17, 556-560.
12. Martínez Olmos MA, et al. (2020). Nutritional status study of in-patients in hospitals of Galicia. European Journal of Clinical Nutrition, 59, 938-946.
13. Vidal A, et al. (2018). Prevalence of malnutrition in medical and surgical services of a university hospital. Nutrición Hospitalaria, 23, 263-267.
14. Burgos R, et al. (2022). Prevalence of malnutrition and its etiological factors in hospitals. Nutrición Hospitalaria, 27(2), 469-476.
15. Álvarez Hernández J, et al. (2021). Multidisciplinary consensus on the approach to hospital malnutrition in Spain. Sociedad Española de Nutrición Parenteral y Enteral.
16. Planas Vila M, et al. (2019). The burden of hospital malnutrition in Spain: methodology and development of the PREDyCES study. Nutrición Hospitalaria, 25(6), 1020-1024.
17. Schindler K, et al. (2019). How nutritional risk is assessed and managed in European hospitals: a survey of 21,007 patients. Clinical Nutrition, 29, 552-559.
18. Thibault R, et al. (2021). Assessment of food intake in hospitalised patients: A 10-year comparative study. Clinical Nutrition, 30, 289-296.
19. Hiesmayr M, et al. (2019). Decreased food intake is a risk factor for mortality in hospitalised patients. Clinical Nutrition, 28, 484-491.
20. Schneider SM, et al. (2024). Malnutrition is an independent factor associated with nosocomial infections. British Journal of Nutrition, 92, 105-111.
21. Calleja-Fernández A, et al. (2019). Prevalence of malnutrition and relationship with hospital stay in a general surgery department. Nutrición Hospitalaria, 24 (Suppl 1), 23.
22. Vidal Casariego A, et al. (2019). Comparison of different nutritional screening tools in patients with general surgery and internal medicine. Endocrinología y Nutrición, 56, 98.
23. British Association for Parenteral and Enteral Nutrition (BAPEN). (2023). Malnutrition Universal Screening Tool (MUST).
24. Franklin GA, et al. (2021). Physician-delivered malnutrition: Why do patients receive nothing by mouth or a clear liquid diet in a university hospital setting? Journal of Parenteral and Enteral Nutrition, 35(3), 337-342.
25. Somanchi M, et al. (2021). The facilitated early enteral and dietary management effectiveness trial in hospitalized patients with malnutrition. Journal of Parenteral and Enteral Nutrition, 35, 209-216.
26. Lim, SL, et al. (2022). Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality. Clinical Nutrition, 31(3), 345-350.
27. Lobo G, et al. (2019). Hospital malnutrition: relationship with length of stay and rate of premature readmissions. Medicina Clínica (Barcelona), 132, 377-384.
28. Sullivan DH, et al. (2022). Protein-energy undernutrition and the risk of mortality within six years of hospital discharge. Journal of the American College of Nutrition, 17, 571-578.