

ORIGINAL ARTICLE



Survey of Nutritional Screening Status as Well as Dietitian to Patient Ratio in Various Healthcare Setups in India

OPEN ACCESS

Received: 25.12.2022

Accepted: 26.01.2023

Published: 25.02.2023

Shilpa Varma^{1*}, Megha Kapoor², Mansi Patil³, Datta Patel⁴, Shivshankar Timmanpyati²**1** Clinical Nutritionist, BelleVue Multispeciality Hospital, Mumbai, India**2** Dietitian, Tata Memorial Hospital, (HBNI), Mumbai, India**3** Chief Dietitian, Asha Kiran JHC Hospital, Pune, India**4** Head of Department of Nutrition and Dietetics, D.Y. Patil School of Medicine and Hospital, Navi Mumbai, India

Citation: Varma S, Kapoor M, Patil M, Patel D, Timmanpyati S. (2023). Survey of Nutritional Screening Status as Well as Dietitian to Patient Ratio in Various Healthcare Setups in India. *Journal of Nutrition Research*. 11(1): 33-37. https://doi.org/10.55289/jnutres/v11i1_22.24

* **Corresponding author.**shilpavarma2008@gmail.com**Funding:** None**Competing Interests:** None

Copyright: © This is an open access article distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Published By India Association for Parenteral and Enteral Nutrition (IAPEN)

ISSN

Electronic: 2348-1064

Abstract

It's very well documented that malnutrition is an independent risk factor that has an impact on treatment outcomes and further influences the quality of life and survivorship. Nutritional attention with timely intervention is an integral component of patient care which corresponds to improved disease outcomes. Adequate nutrition not only provides economic and physiological benefits but also ensures psychological comfort throughout the patient's journey and during and after treatment. Evaluation of the patient's nutritional status is critical in determining the nutritional prescription for the patient. Several studies indicate early identification of malnourished patients or at risk of malnutrition is the key to begin timely and adequate nutrition attention. This multi-centre study attempted a nationwide online survey on malnutrition screening from 19th November to 18th December 2022. Out of 644 responses received, 443 were considered for analysis, and 201 were excluded. Responses from hospitals with less than 50 beds and multiple entries from the same hospital were not considered for analysis. Out of 443 hospitals, 287 (64.7%) were accredited and 156 (35.2%) were non-accredited. It was observed in the survey that nutritional screening (NS) was performed in 361 (81.5%) hospitals out of 443. A majority (90.9%) of the accredited hospitals (n=261) undertook regular NS as opposed to government and charitable trust hospitals (n=100). For NS, 47.4% of accredited and 22.4 % of non-accredited hospitals used a single screening tool of choice. There were 26 non-accredited hospitals with no dietician service. The average number of dieticians in accredited hospitals and non-accredited hospitals were 4.4 ± 3.94 SD and 2.3 ± 3.93 respectively. The dietician-patient ratio in accredited and non-accredited hospitals was 1:73, and 1:212 respectively. Conclusion: Adequate and standard NS practices are lacking in both accredited and non-accredited hospitals with a poor dietician-to-patient ratio. We propose a better dietician-patient ratio and a simple and rapid first-

line tool to detect malnutrition in patients in Indian healthcare setups where there is a massive influx of patients to be matched with multifaceted socio-economic issues and fewer staff.

Keywords: Nutrition screening; Malnutrition; Dietitian:Patient ratio; Nutrition care pathway

Introduction

Nutritional care is an inherent component of a basic and systematic approach to reveal the medical indication of nutritional therapy for hospitalised patients which is elicited with timely nutritional screening⁽¹⁾. Hospital-based Malnutrition has been a worldwide challenge and reality. Globally, the burden of malnutrition ranges from 10 % to 50 % among hospitalised patients with many reporting a further decline in the nutritional status during hospital admission⁽²⁻⁵⁾. Early nutrition support is needed to attenuate the metabolic response to stress among acutely ill patients and prevent oxidative injury⁽⁶⁾. Nutrition support has evidently improved the clinical outcome in acutely ill patients, and thus it is important to identify malnutrition through nutritional screening correctly⁽⁷⁾. Early and prioritised identification of patients at risk of malnutrition using an easy-to-use tool by a clinical dietitian is crucial to start timely and adequate nutritional support⁽⁸⁾.

Adverse clinical outcomes are observed due to altered physiological function as a consequence of malnutrition. This is further evident in malnourished hospitalised patients especially surgical and elderly who have complications. The mortality rates of these patients are four times higher than the well-nourished patients. The hospital stay for these patients is longer compared to well-nourished patients, leading to increased treatment costs by nearly 25 %⁽⁹⁾. In 2007, ICD 9 codes, malnutrition is recognized as a separate disease with an ICD code of 260-269, thus further supporting the need to identify and combat malnutrition⁽¹⁰⁾.

The purpose of NS was described by the European Society for Clinical Nutrition and Metabolism and American Society for Parenteral and Enteral Nutrition as a process that supports to predict the pos-

sibility of a better or worse outcome consequently due to nutritional factors, and to determine whether nutritional treatment provided is likely to be influence⁽¹¹⁾. The importance of NS is well-researched and has been included in several international guidelines⁽¹²⁾. Unfortunately, there is still a lack of routine NS in hospitals thus leading to unmet nutritional goals for people with malnutrition and those at risk of malnutrition⁽¹²⁾. Limited studies have been conducted in India to identify/elicite the prevalence of NS in hospitals and healthcare setups.

There are many validated tools for NS and assessment that exist for the identification of patients who are malnourished or at risk of malnutrition. Among the various tools, Malnutrition Screening Tool (MST) is a simple instrument developed to identify patients at risk of malnutrition⁽¹³⁾. Pertained to the MST, the Malnutrition Universal Screening Tool (MUST) was developed to detect both undernutrition and obesity in ambulatory settings⁽¹⁴⁾. For the elderly population, Mini Nutritional Assessment – the Short Form (MNA-SF) and GNRI (Geriatric Nutritional Risk Index) was developed^(15,16). The Nutritional Risk Screening (NRS-2002) tool is another preferred tool for hospitalised patients⁽¹⁷⁾.

These existing tools have certain limitations, especially in large hospitals healthcare setups, and institutes with limited staff, or dietitians. Screening tools such as MST and NRS-2002 use anthropometric measurements which are sometimes unreliable because of underlying oedema and use history of dietary intake/weight loss which is dependent on the patient's memory^(7,17). In the case of MUST, the score cannot be calculated if the unplanned weight in the past 3 – 6 months is not recalled by the patient⁽¹⁸⁾, whereas NRS derives most of its scores from food intake data.

These tools (NRS-2002, MUST, MST) are well assessed and validated in various scenarios, including randomized controlled trials, and found to be highly reliable however inaccurate completion or calculations of parameters, and skill levels of the healthcare staff using them may become a barrier for busy healthcare staff in the wards⁽¹⁹⁾.

It has been revealed that even if different tools account for the equivalent percentage of malnourished patients, there is a difference in the number of subjects identified at risk⁽²⁰⁾. Therefore, there's a lack of a NS tool, especially in Indian healthcare setup scenarios which is easy to administer and gives reliable results while eliminating patient recall bias⁽²¹⁾.

The purpose of a NS is to indicate the patient's nutritional issue and the need for nutritional intervention. It should not be used to assess nutritional status and establish the severity of malnutrition, both of which are the next steps in the nutrition care process.

Hence, a quick and precise screening of malnutrition is the need of the day to improve the prevalent poor nutritional status in the country, especially in hospitalized patients⁽²²⁾. Ideally, the nutritional screening method should be easy to perform with no special skill requirements, should be practical, non-invasive, with no requirement of examination devices, should be feasible at the bedside, with good sensitivity, specificity, and predictive validity to yield immediate results.

Worldwide hospital accreditation programs have contributed immensely in improving the quality of medical care and improving patient safety. The two most common accreditation systems are the Joint Commission International (JCI) and National Accreditation Board for Hospitals & Healthcare Providers (NABH). NABH is the most necessary benchmark of the Quality Council of India (QCI) that is based on the ideas of International Accreditation Standards like JCI, The Australian Council on Healthcare Standards (ACHS), and so forth. Accredited hospitals have fared better in providing clinical nutrition services to patients compared to non-accredited healthcare setup⁽²³⁾.

The aim of this study is to identify, describe and analyse the issues in the nutrition care process of adult patients visiting a hospital or having been admitted for treatment more so in an Indian scenario. The issues are classified into two areas 1) Absence of standard malnutrition screening protocols followed in varied Indian Hospitals and 2) Insufficient dietician staff available for nutrition care services in the health care settings.

Methodology

This multi-centre online survey study analyses status of nutrition screening services and the availability of dieticians for nutrition care services at hospitals and health care centres in India. To collect systematic and comprehensive data to understand the malnutrition screening pattern across

India and the present scenario on the dietician-patient ratio in varied hospitals and health care units, a nationwide online survey was conducted. A close-ended questionnaire divided into two main categories was formed. Questions were framed basically to understand 1) the prevalence of Nutrition Screening in the varied Indian Hospital scenario and 2) to study the staffing of dieticians in hospitals as per patient strength across different healthcare setups. Data was collected with the help of an online questionnaire sent to dietetics practitioners in different hospitals and to other health care professionals (HCP). Hospitals where dieticians were not available or not employed as staff, this survey was shared with the respective health care professionals (HCP). When HCP couldn't be contacted, the survey information was collected by telephonic call. Data entry and statistical analysis were performed. Descriptive data were expressed as numbers and percentages (%) and continuous variables were expressed as mean.

Results

The online survey questionnaire was responded by 644 clinical experts including, dieticians, physicians, and professional administrators from hospitals across 120 cities in India. Four hundred forty-three responses were considered for analysis. Thirty-one responses did not answer about NS details, responses from hospitals with less than 50 beds, and multiple entries from some hospitals were excluded from the evaluation for this study.

The survey responses from hospitals were categorized as accredited 287 (64.7%) and non-accredited 156 (35.2%) hospitals. The survey revealed that NS was performed in 361 (76.2%) hospitals out of 443 hospitals. NS was more regular in accredited hospitals, 90.3 % (n=261), and was grossly neglected in government and charitable trust managed hospitals as out of the data collected, only 100 (64.1%) hospitals performed nutrition screening. There were a significant number of patients who visited the nutrition clinic without formal NS for dietary advice either in their own interest or were guided by some other patient or were referred by doctors or health care professionals (HCP) when patients asked nutrition related questions. Thus, NS was not done regularly in both the hospital categories selected for this study.

For NS, different hospitals used different screening tools, (n=136) 47.4% of accredited hospitals, and (n=35) 22.4 % non-accredited hospitals used a single screening tool whereas, 23 (8.01%) accredited and 4 (2.56%) non-accredited hospitals used multiple NS tools. There were a few accredited n=12 (4.18%) and n=19 (12.18%) non-accredited hospitals that did not use any NS tool. In 16.25% hospitals, patients were just asked some random questions regarding issues with food consumption and if there are any, then the concern would refer to dieticians for nutrition advice. But, to note here that

Table 1. Details of responses nutrition screening and dietitian patient ratio

	Accredited	Percentage	Non accredited	Percentage	Total	Percentage
Number of hospitals	287	65%	156	35%	443	
Beds	91889		75678		167567	
Dietitians	1264		357		1621	
Ratio	1: 73		1: 212		1:103.4	
Average Dietitians per hospital	4.4		2.3		3.6	
Screening Done	261	90.90%	100	64.10%	361	81.49%
Not Done	26	9.1	56	35.80%	82	18.51%
Single Tools	136	47.39%	35	22.44%	171	38.60%
Multiple Tools	23	8.01%	4	2.56%	27	6.09%
No screening tool	12	4.18%	19	12.18%	31	6.99%
Referred by other patients	76	26.48%	66	42.31%	142	32.05%
Random Questions	40	13.93%	32	20.51%	72	16.25%

many patients who required nutrition care may have been left out for dietetic reference in the process.

The average number of dietitians in accredited hospitals and non-accredited hospitals were 4.4 and 2.1 respectively. The dietitian-to-patient ratio in accredited and non-accredited hospitals were 1: 73, and 1: 212 respectively.

Discussion

The prevalence of malnutrition depends on the type of disease and is present in a highly variable percentage (between 20-80%) of patients admitted to hospitals.⁽²⁴⁾ There is a lack of data on the prevalence of hospital malnutrition screening in patients undergoing treatment in India. The aim of our study was to report for the first time a large-scale pattern of malnutrition screening, and available dietitian service in Indian hospitals. Our study survey was received in all 474 hospitals from 137 cities pan India. Out of 474 responses, 31 responses were incomplete. In all we found that there was no standard pattern of NS that was followed, in terms of regular screening, uses of the screening tool, and available dietitian services in both accredited and non-accredited hospitals. The NS was performed in 90.3% (n=261) accredited hospitals and just n=100 (64.1%) non-accredited hospitals. Non-accredited hospitals (n=156) were managed by the government charitable trusts and some private hospitals.

Global studies strongly indicate that prevalence of malnutrition in cancer patients can be up to 70% and even more^(25,26). It also estimated 10–20% of cancer patients' deaths are related to malnutrition and not the malignancy itself⁽²⁴⁾. Hence, we extracted the data of cancer specialised hospitals from the surveyed list. (Table 2). There were overall 67 cancer specialised hospitals and/or were listed in the

national cancer grid website from 474 centres surveyed. Out of 67 hospitals, 10 hospitals had accreditation and 57 were non-accredited. The total cumulative number of beds and dietitians employed in these accredited and non-accredited cancer specialised hospitals was 1199 beds with 22 dietitians and 33812 beds with 83 dietitians respectively. Evaluation of nutritional risk in cancer patients is important due to the potential side effects of the treatment. The dietitian-to-patient ratio was 1:54 and 1:407 in accredited and non-accredited hospitals respectively. There were 23 non-accredited hospitals that had no dietitian services available and there were in total 17 hospitals with only one dietitian.

Table 2. Details of cancer specialized hospitals

	Accredited	Non accredited	Total
Total hospital responses	10	57	67
Beds	1199	33812	35011
Total No of Dietitians	22	83	105
Dietitian Patient Ratio	1: 54	1: 407	1: 333
Average of Dietitians per hospital	2.2	1.5	1.6
Hospitals with no dietitian service	0	23	23 (34.3%)
Hospitals with single dietitian	7 (70.0%)	17 (29.8%)	24 (35.8%)

Conclusion

Adequate and standard nutritional screening practices are lacking in both accredited and non-accredited hospitals with a poor dietitian to patient ratio. We propose a better dietitian-patient ratio and a simple and rapid first-line tool to detect malnutrition in patients in Indian healthcare setups where there is a massive influx of patients to be matched with multifaceted socio-economic issues and fewer staff. This multi-centre study poses to reflect that more research, ease of screening tool, early identification of malnutrition, more in-depth need for adhering to nutritional care pathways to reduce malnutrition for better clinical outcomes and survival of patients is way forward as modifiable determinants that requires better hospital nutrition protocols and better dietitian to patient ratio.

Acknowledgement

The authors thank all dietitians, healthcare professionals and hospital management for their voluntary and magnanimous participation in this nationwide multicentre online survey study.

References

- Lassen KO, Olsen J, Grinderslev E, Kruse F, Bjerrum M. Nutritional care of medical inpatients: a health technology assessment. *BMC Health Services Research*. 2006;6(7):1–12. Available from: <https://doi.org/10.1186/1472-6963-6-7>.
- Saunders J, Smith T. Malnutrition: causes and consequences. *Clinical Medicine*. 2010;10(6):624–627. Available from: <https://doi.org/10.7861/clinmedicine.10-6-624>.
- Correia MIT, Campos ACL, Cooperative E, Study, ELAN Cooperative Study. Prevalence of hospital malnutrition in Latin America: the multicentre ELAN study. *Nutrition*. 2003;19(10):823–828. Available from: [https://doi.org/10.1016/S0899-9007\(03\)00168-0](https://doi.org/10.1016/S0899-9007(03)00168-0).
- Elia M, Stratton RJ. How much undernutrition is there in hospitals? *Br J Nutr*. 2000;84(3):257–266. Available from: <https://doi.org/10.1017/S0007114500001525>.
- Puthuchery ZA, Rawal J, Mcphail M, Connolly B, Ratnayake G, Chan P, et al. Acute Skeletal Muscle Wasting in Critical Illness. *JAMA*. 2013;310(15):1591–1591. Available from: <https://doi.org/10.1001/jama.2013.278481>.
- Russell CA, Elia M, BAPEN and collaborators. Nutrition Screening Survey in the UK in 2008. Redditch, Worcestershire. BAPEN. 2008. Available from: https://www.bapen.org.uk/pdfs/nsw/nsw_report2008-09.pdf.
- Elia M, Russell C, Malnutrition Advisory Group, BAPEN. The 'MUST' Report. Nutritional screening for adults: a multidisciplinary responsibility. Development and use of the 'Malnutrition Universal Screening Tool' (MUST) for adults. A report by the Malnutrition Advisory Group of the British Association for Parenteral and Enteral Nutrition, 2003. 2003. Available from: <https://www.bapen.org.uk/pdfs/must/must-report.pdf>.
- Nagel MR. Nutrition screening: identifying patients at risk for malnutrition. *Nutrition in Clinical Practice*. 1993;8(4):171–175. Available from: <https://doi.org/10.1177/0115426593008004171>.
- Lim KSL, Benjamin C, Ong YH, Chan W, Loke MC, Ferguson L, et al. Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality. *Clinical Nutrition*. 2012;31(3):345–350. Available from: <https://doi.org/10.1016/j.clnu.2011.11.001>.
- International Statistical Classification of Diseases and Related Health Problems 11th Revision (ICD-11). 2020. Available from: <https://icd.who.int/browse11/l-m/en>.
- Omidvari AH, Vali Y, Murray SM, Wonderling D, Rashidian A. Nutritional screening for improving professional practice for patient outcomes in hospital and primary care settings. *Cochrane Database of Systematic Reviews*. 2013;2013(6):CD005539. Available from: <https://doi.org/10.1002/14651858.cd005539.pub2>.
- Schindler K, Pernicka E, Laviano A, Howard P, Schütz T, Bauer P, et al. How nutritional risk is assessed and managed in European hospitals: A survey of 21,007 patients findings from the 2007–2008 cross-sectional nutritionDay survey. *Clinical Nutrition*. 2010;29(5):552–559. Available from: <https://doi.org/10.1016/j.clnu.2010.04.001>.
- Ferguson M, Capra S, Bauer J, Banks M. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. *Nutrition*. 1999;15(6):458–464. Available from: [https://doi.org/10.1016/S0899-9007\(99\)00084-2](https://doi.org/10.1016/S0899-9007(99)00084-2).
- Stratton RJ, King CL, Stroud MA, Jackson AA, Elia M. 'Malnutrition Universal Screening Tool' predicts mortality and length of hospital stay in acutely ill elderly. *British Journal of Nutrition*. 2006;95(2):325–330. Available from: <https://doi.org/10.1079/bjn20051622>.
- Guigoz Y. The Mini Nutritional Assessment (MNA) review of the literature-What does it tell us? *J Nutr Health Aging*. 2006;10(6):466–485. Available from: <https://pubmed.ncbi.nlm.nih.gov/17183419/>.
- Bouillanne O, Morineau G, Dupont C, Coulombel I, Vincent JPP, Nicolis I, et al. Geriatric Nutritional Risk Index: a new index for evaluating at-risk elderly medical patients. *The American Journal of Clinical Nutrition*. 2005;82(4):777–783. Available from: <https://doi.org/10.1093/ajcn/82.4.777>.
- Kondrup J, Rasmussen HH, Hamberg O, Stanga Z. Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials. *Clinical Nutrition*. 2003;22(3):321–336. Available from: [https://doi.org/10.1016/S0261-5614\(02\)00214-5](https://doi.org/10.1016/S0261-5614(02)00214-5).
- Pathirana AK, Lokunarangoda N, Ranathunga I, Santharaj WS, Ekanayake R, Jayawardena R. Prevalence of hospital malnutrition among cardiac patients: results from six nutrition screening tools. *SpringerPlus*. 2014;2014(3):412. Available from: <https://doi.org/10.1186/2193-1801-3-412>.
- Reber E, Gomes F, Vasiloglou MF, Schuetz P, Stanga Z. Nutritional Risk Screening and Assessment. *J Clin Med*. 2019;8(7):1065. Available from: <https://doi.org/10.3390/jcm8071065>.
- Stratton RJ, Hackston A, Longmore D, Dixon R, Price S, Stroud M, et al. Malnutrition in hospital outpatients and inpatients: prevalence, concurrent validity and ease of use of the 'malnutrition universal screening tool' ('MUST') for adults. *British Journal of Nutrition*. 2004;92(5):799–808. Available from: <https://doi.org/10.1079/bjn20041258>.
- Van Bokhorst-De Van Der Schueren MAE, Guaitoli PR, Jansma EP, De Vet HCW. Nutrition screening tools: Does one size fit all? A systematic review of screening tools for the hospital setting. *Clinical Nutrition*. 2014;33(1):39–58. Available from: <https://doi.org/10.1016/j.clnu.2013.04.008>.
- Mahadevan A, Eswaran H, Sundari M. Nutritional Risk Screening in Hospitalized Adults Using the Malnutrition Universal Screening Tool at a Tertiary Care Hospital in South India. *Cureus*. 2022;14(5):e24681. Available from: <https://doi.org/10.7759/cureus.24681>.
- Um MH, Lyu ES, Lee SM, Park YK. International hospital accreditation and clinical nutrition service in acute care hospitals in South Korea: results of a nationwide cross-sectional survey. *Asia Pac J Clin Nutr*. 2018;27(1):158–166. Available from: <https://doi.org/10.6133/apjcn.032017.25>.
- Waitzberg DL, Ravacci GR, Raslan M. Hospital hypo nutrition. *Nutr Hosp*. 2011;26(2):254–264.
- Arends J. Ernährung von Tumorpatienten. *Aktuel Ernährungsmed*. 2012;37(2):91–106.
- World Health Organization, Global Cancer burden. 2018.