Original Research Article

Double burden of malnutrition in psychiatric disorders: a hospital-based cross-sectional study in Eastern India

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ABSTRACT

Background: Psychiatric disorders are associated with nutritional impairment due to multiple reasons, including altered appetite, loss of functional abilities, and quality of life. Improving dietary intake may reduce the risk of malnutrition among psychiatric patients. However, it is not clear whether disease severity and hospitalization can impair this process. Therefore, in the present study, we intend to compare the risk of malnutrition in hospitalized patients who receive a planned diet under supervision versus community-dwelling psychiatric patients who generally have poor dietary intakes.
Methods: A cross-sectional pilot study was conducted with 48 in-patients and 50 out-patients at a tertiary hospital in Kolkata, West Bengal. The risk of malnutrition was determined using Malnutrition Universal Screening Tool (MUST). Anthropometric and blood pressure measurements were performed. Dietary intake was recorded, and nutritional value was calculated.
Results: The in-patients were at a higher risk of malnutrition than the out-patients (P<0.05). The in-patients had a significantly lower BMI, systolic blood pressure and diastolic blood pressure (P<0.001). The in-patients had both undernutrition (31.25%) and obesity (22.92%), whereas, the out-patients were predominantly obese (64%). Dietary analysis revealed that the nutritive value of hospital diet was better than the diets consumed by the out-patients.
Conclusions: Psychiatric patients had a double burden of malnutrition. The risk of malnutrition may worsen with disease severity. In spite of receiving a balanced diet, the in-patients were at a higher risk of malnutrition. Additional nutrition support is required to promote the nutritional status of psychiatric patients.

Keywords: Diet, Malnutrition, Psychiatric disorders

INTRODUCTION

Psychiatric disorders are one of the significant public health challenges in India. Mental health morbidities are associated with functional impairment and reduced quality of life, which has numerous physical, social and economic consequences.[1-3] As per the estimation of National Mental Health Survey (2016), nearly 150 million individuals suffer from mental morbidities in India, with a treatment gap of 84.5%.[4] The prevalence of mental health morbidities varies between different Indian states. In West Bengal, the prevalence of common mental disorders is 11.3%, while severe mental health disorders is 2.3% and depressive disorders is 4.3%, with a treatment gap ranging from 85.2% to 90.2%.[5] Previous studies have shown that malnutrition is a common problem faced by psychiatric patients and it increases as the condition gets worse.[3,6-8] The causes of malnutrition

in psychiatric patients are multiple, including altered appetite, poor dietary quality, role limitations and functional impairments. Particularly, psychiatric disorders are associated with increased food intake and weight gain, which might be due to medication side effects.[9] The commonly prescribed medicines for psychiatric patients include antipsychotics, antidepressants and mood-stabilizing agents which are linked to increased appetite, decreased satiety, weight gain and metabolic alterations.[10] Additionally, malnutrition in psychiatric patients increases the risk of lifestyle disorders including metabolic syndrome, cardiovascular diseases and diabetes.[11] This ultimately leads to poor prognosis, decreased quality of life and increased caregiver burden. It is generally believed that a balanced diet can improve nutritional wellbeing and optimize health outcomes of psychiatric patients. However, it is not well studied whether disease severity and hospitalization can interfere with nutritional outcomes in psychiatric patients, in spite of receiving a healthy balanced diet. Therefore, in the current study we aim to compare the risk of malnutrition in psychiatric in-patients who receive a planned hospital diet versus out-patients who generally have a poor dietary quality.

METHODS

Study setting

A cross-sectional pilot study was conducted at the Department of Psychiatry, Calcutta National Medical College and Hospital, Kolkata (Calcutta Pavlov Hospital); between May, 2024 to July, 2024.

Inclusion criteria

The inclusion criteria for the subjects were in-patients (admitted for >1 month) and out-patients receiving treatment for mental illness at Calcutta Pavlov Hospital; age>18 years; capable of basic communication in Bengali, Hindi or English.

Exclusion criteria

Patients with acute illness and/or serious comorbid conditions were excluded.

The subjects were recruited using convenience sampling. A pre-designed, semi-structured questionnaire was used to collect sociodemographic details and medical history. Socioeconomic status was identified using modified Kuppuswamy scale.[12] Informed consent was obtained from the participants and/or caregivers attending the out-patient department. For in-patients, approval was taken from the medical professional in-charge.

Nutritional screening

Anthropometric measurements (height and weight) were performed by two trained nutritionists using a standardized stadiometer and digital weighing scale. Body mass index (BMI) was calculated. Malnutrition Universal Screening Test (MUST) was used for nutritional screening. MUST is a validated tool suitable for nutritional screening in hospitals and communities.[13] A score of '0' indicates 'low risk', '1' indicates 'moderate risk' and '>=2' indicates 'high risk' of malnutrition. Systolic and diastolic blood pressure were measured using an aneroid sphygmomanometer in a sitting position. Means of two different readings were recorded.

Dietary assessment

The in-patients received a standard cyclical diet from the hospital, which was analyzed for nutritive value. 24-hour recall was conducted to capture dietary intake of out-patients with the help of caregivers. Cooked foods were converted to raw foods using pre-standardized recipes. The energy value and macronutrient content were calculated using Indian Food Composition Table.14 Additionally, information on decline in food intake over past three months was recorded.

Statistical analysis

Data analysis was performed by using Microsoft Excel-2013 and Statistical Package for Social Sciences (SPSS, version 23.0). Data presented as Median (IQR) or frequency. Mann-Whitney U-test and Chi-Squared test were used for making comparisons between in-patients and out-patients. P<0.05 was considered to be statistically significant.

RESULTS

A total 98 psychiatric patients (48 in-patients and 50 out-patients) were included in the study. The general characteristics of the participants are summarized in Table 1.

Table 1: General characteristics of the participants.

General characteristics	Inpatients (n=48)	Outpatients (n=50)
Age, Median (IQR)	NA	38.00 (11.00)
Female, N (%)	30 (62.50)	37 (74.00)
Socioeconomic status		
Lower		28 (56.00)
Upper lower	NA	16 (32.00)
Lower middle		06 (12.00)
Physical activity		
Sedentary	48 (100.00)	30 (60.00)
Moderate	-	17 (34.00)
Heavy	-	03 (6.00)

NA: Not available. In-patients were not able to report age and socioeconomic status due to severe mental disorders.

The in-patients were not able to report their age, however all were adults. Many of the in-patients were rescued and not well connected to their families, therefore, no credible information about socioeconomic status were available. The frequency distribution of different psychiatric morbidities are presented in Figure 1. The majority of in-patients had Severe Mental Disorders, including schizophrenia, psychosis and bipolar affective disorder. Dementia and intellectual disabilities were also observed. Among out-patients Common Mental Disorders were predominant, including neurotic and stress-related disorders. Additionally, somatoform disorders and depressive disorders were common.

The details of nutritional screening and status have been summarized in Table 2 and Table 3. MUST analysis revealed that in-patients were at moderate-to-high risk of malnutrition, while out-patients were at low-to-moderate risk. BMI was significantly (P<0.001) lower among in-patients than out-patients. Category-wise evaluation of BMI (Table 3) revealed that in-patients were more likely to be undernourished, whereas out-patients were more likely to be obese (P<0.001). Additionally, significantly lower systolic blood pressure (SBP) and diastolic blood pressure (DBP) were observed among in-patients (P<0.001).
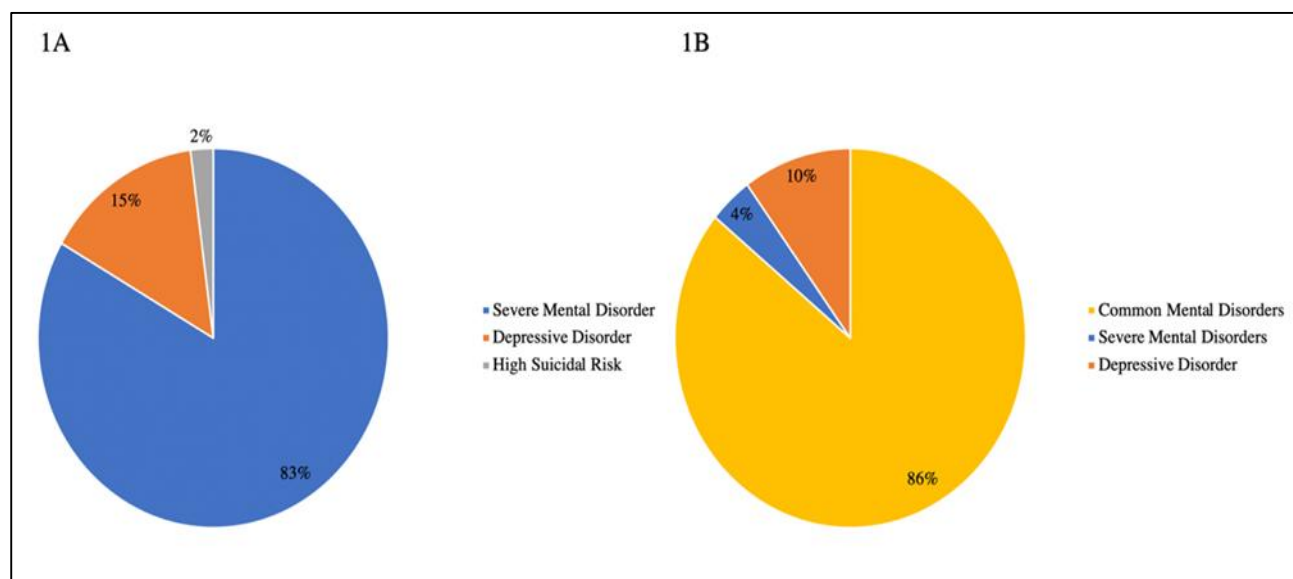

Figure 1: Prevalence of different psychiatric disorders among inpatients and outpatients.

1A: In-patients; 1B: Out-patients. A higher prevalence of severe mental disorders was observed among in-patients, whereas, a higher predominance of common mental disorders was observed among out-patients.

Table 2: Nutritional screening of the participants.

Nutritional screening parameters		In-patient (n=48)	Out-patient (n=50)	P value
MUST, N (%)	Low risk	22 (45.83)	34 (68.00)	0.039*
	Moderate risk	11 (22.92)	10 (20.00)	
	High risk	15 (31.25)	06 (12.00)	
BMI, Median (IQR)		20.00 (5.25)	24.70 (6.50)	<0.001**
SBP, Median (IQR)		99.50 (17.50)	110.00 (20.00)	<0.001**
DBP, Median (IQR)		63.00 (13.00)	70.00 (18.00)	<0.001**

MUST: Malnutrition Universal Screening Test; BMI: Body Mass Index; SBP: Systolic Blood Pressure; DBP: Diastolic Blood Pressure. Data compared using Chi-Squared Test and Mann-Whitney U test. Data significant at *5% level and **1% level.

Table 3: Nutritional status of the participants.

Nutritional status	In-patient (n=48)	Out-patient (n=50)	P value
Undernutrition, N (%)	15 (31.25)	01 (2.00)	<0.001**
Normal, N (%)	22 (45.83)	17 (34.00)	
Obesity, N (%)	11 (22.92)	32 (64.00)	

Undernutrition: BMI<18.50, Normal: 18.5-22.99, Obesity>23.00. Data compared using Chi-Squared Test. Data significant at **1% level.

Table 4: Nutritive value of in-patient and out-patient diets.

Nutritive value of diets	In-patients	Out-patients
Energy [Kcal]	1652.28 (129.38)	1540.50 (413.74)
Carbohydrate [%Kcal]	62.63 (4.91)	71.01 (3.43)
Protein [%Kcal]	13.24 (1.04)	9.47 (2.71)
Fat [%Kcal]	25.91 (3.94)	19.63 (1.99)

Nutritive value of in-patient diet represents the Median (IQR) of seven days cyclical standard hospital diet. Nutritive value of out-patient diet represents the Median (IQR) of 24-hour recall of each subject.

Furthermore, we were interested to look at the dietary intake of the subjects. The in-patients received a standard cyclical diet, which was comparatively better than those consumed by the out-patients (Table 4). The out-patients had a higher consumption of carbohydrate (%kcal) and a lower consumption of protein (%kcal) and fat (%kcal) than the in-patients. However, both in-patient and out-patient diets exceeded the acceptable macronutrient distribution range (AMDR) of carbohydrate for adults (50-55 %kcal).

DISCUSSION

In the present study, we observed that in-spite of receiving a planned hospital diet under supervision, the in-patients were at a higher risk of malnutrition than out-patients. The out-patients had a higher BMI (obese range) and carbohydrate (%kcal) consumption, whereas the in-patients had better energy, protein and fat levels in their diet. Earlier studies from other countries report similar observations. Risch et al observed that both psychiatric in-patients and out-patients were at similar risk of malnutrition; however, BMI was significantly higher among out-patients.[15] Although psychiatric disorders are associated with weight gain and obesity, there are studies that have reported varying prevalence of undernutrition among psychiatric patients ranging from 1% to 63%.[16,17] Studies from Ethiopia indicate that the prevalence of undernutrition is higher in psychiatric in-patients and out-patients combined (63%), than out-patients alone (28.5%-43%).[17-19] Similarly, in Japan, the prevalence of undernutrition was higher among in-patients (17.4%) than out-patients (4.3%).[20] The reasons of undernutrition among psychiatric in-patients can be multiple. In general, undernutrition is positively related to depression, emotional distress and duration of hospitalization.[21] The possible reasons are changes in regular meals, restricted meal times, altered appetite, interruption of sleep at night etc.[21] Overall, this indicates a risk of double burden of malnutrition among psychiatric patients, with in-patients more likely to be undernourished and out-patients more likely to be obese, as observed in the present study. Our previous study shows that dietary diversity and food variety of elderly out-patients with dementia was significantly lower than healthy subjects of similar sociodemographic profiles, highlighting a poor dietary quality among community-dwelling psychiatric patients.[22] In the current study, possibly, poor dietary choices, sedentary lifestyle and carbohydrate predominant diet consumption coupled with medication side effects have contributed to obesity development among out-patients. Similarly, among in-patients, higher disease severity, emotional distress, prolonged hospitalization coupled with medication side-effects might have contributed to both undernutrition and obesity development. In-patients were more likely to be undernourished, possibly, because lack of hygiene, infections, infestations, unpredictable food intake and food wastage may cause weight loss among these patients. Furthermore, social exclusion and rejection by family members might be responsible for higher risk of malnutrition among in-patients.[23] Another possible explanation could be gut microbiome dysbiosis and inflammation. Psychiatric disorders are associated with gut dysbiosis which can be aggravated by hospitalization, contributing to inflammation.[24-26] Such changes might be responsible for the double burden of malnutrition as observed among in-patients. Furthermore, we observed that blood pressure was lower among in-patients than out-patients, which aligns with earlier observations and might be associated with a restrictive hospital environment.[27,28] Therefore, a targeted nutrition care process should be implemented to improve the nutritional status of the psychiatric patients, and a dedicated team of healthcare professionals should be involved in the process.[9] The strength of the present study is that we have included both in-patients and out-patients, and used validated tools for the analysis. To the best of our knowledge, this is the first study to report double burden of malnutrition among psychiatric patients in Eastern India.

However, from the current study, it is unclear which factors predict undernutrition and overnutrition among psychiatric patients, particularly in-patients. Also, biochemical parameters were not assessed, which is a limitation of the study. Therefore, further studies with larger sample size are warranted.

CONCLUSION

A double burden of malnutrition was observed among psychiatric patients. The risk of malnutrition was higher among in-patients than out-patients. Routine screening and additional nutrition support will be helpful for people with psychiatric disorders.

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