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Nutritional overview of non-critical COVID-19 patients during quarantine in a premier hospital of India

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ABSTRACT

Background and Objectives: Corona virus disease (COVID-19) is a recent global disease. During hospital quarantine of non-critical COVID-19 patients, specific attention is given on their general management and little is known regarding the nutritional approach. The present study was therefore conducted to assess their dietary predilections during hospital quarantine.

Methods: A prospective observational study was conducted in non-critical COVID-19 patients admitted in isolation wards of All India Institute of Medical Sciences (AIIMS), New Delhi from 1st November 2020 to mid of January 2021. A dietician administered a pre validated questionnaire telephonically to obtain data regarding demographic, anthropometric and dietary characteristics. The results were expressed as mean, standard deviation and median. Chi square tests were used to compare category variables. Statistical analysis was performed using SPSS 9 version 20.0.SPSS, Inc., Chicago IL).

Results: 132 patients volunteered to enrol in the study. The mean age of patients was 34.6 + 13.5 years. Portion size of foods served and number of food groups in breakfast, lunch and dinner as per standard diet scale for balanced hospital diet, did not differentiate by BMI categories (Pearson's $\chi^2 > 0.05$). The mean body mass Index (BMI) was 23.75+ 4.15. Being overweight and obese correlated with taste issues (Pearson's $\chi^2 < 0.05$). Additional centre of attention on fruits, vegetables, fluids and proteins

Conclusions: Owing to the recent growing COVID-19 situation, the findings of the present study may be utilized in developing the most favourable nutritional strategies within the inpatient hospital menu for providing enhanced nutritional care.

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1. Introduction

COVID-19, is an official name applied by the World Health Organization (WHO), referring to a recently emerged disease that has now become the pandemic of the twenty-first century.¹ Recent anecdotal and scientific reports have provided an indication of a link between COVID-19 and chemosensory impairments such as anosmia.² A treasure of swiftly evolving information further suggests that olfactory

and gustatory stimuli can elicit potent emotional responses and are essential in food perception.³ Dietary guidelines regarding non critical COVID-19 in-patients are not currently available in India. The primary aim of the present study was to identify the dietary intake, food consumption patterns and nutritional status of non-critical COVID-19 patients during hospital quarantine. The secondary aim was to identify whether or not there is a statistically significant difference in the dietary intakes considering each independent factor by age, gender, occupation, dietary patterns and body mass index (BMI). It was postulated that

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the findings of the present study will be useful to develop most favourable dietary management strategies for non critical COVID-19 patients under hospital quarantine.⁴⁻⁶

1.1. Subjects and methods

A prospective observational study was conducted in non critical COVID -19 patients admitted in isolation wards of AIIMS, New Delhi from 1st November 2020 to mid of January 2021. The AIIMS food service department provided standard lacto-ovo vegetarian/lacto vegetarian/vegetarian diets, as per patients' nutritional requirements, through computerized meal management system. Ethical clearance was taken before conducting the study. In-patients 18 years and above whom volunteered to participate were included in the study. Demographic variables and body mass index were also determined. A pre-validated questionnaire was telephonically administered by a dietician containing socio-demographic details and questions related to dietary choices and preferences.

The results were expressed as mean, standard deviation and median. Chi square tests were used to compare category variables. Statistical analysis were performed using SPSS 9 version 20.0.SPSS, Inc., Chicago IL).

2. Results

The survey was completed by 132 patients. The demographic, anthropometric and dietary characteristics distribution of the data obtained is given in Table 1. It was observed that maximum number of admitted patients were 26-35 years (42%). 61.36% were males and 38.64% were females. The mean body mass Index (BMI) was 23.75+ 4.15. Many of the patients were unmarried (39.39%). Most of the patients preferred lacto ovo vegetarian (88%) diet. It was observed that 116(87.88%), patients were on standard hospital diet. Out of 132 in-patients 125 were discharged the remaining required transfer in critical care wards.

The belief of patients regarding portion size and of food items and frequency of meals served in a day compared to their earlier eating trends are summarized in Table 2. Only 25 out of 132 patients felt that the portion size of food items to be increased. Only a few patients expressed that meal frequency needed to be increased (29.55%). Most of the in- patients (48.48%), conveyed that total number of food groups were increased from hospital diet. The data given in Table 3, further show that patients observed that the total number of food groups from the hospital diet served were higher.

The data presented in Table 4, further indicated that the number (%) of patients intake for protective food groups that is pulses/legumes 75 (56.82%), milk and its products 71 (53.79%), fruits 78 (59.09%), vegetables 75 (56.82%) and herbs and spices (54.55%). However, the intake of cereals 73 (55.30%) and fats/oils was reduced

86 (65.15%). Preference for high protein, oral nutrition supplements (ONS) was also observed (78.79%). Shows that being overweight and obesity correlated with taste issues (Pearson's $\chi^2 < 0.05$). However, trends of portion size of food items consumed, number of food groups in breakfast, lunch and dinner were not differentiated by BMI categories (Pearson's $\chi^2 > 0.05$).

Table 1: Demographic, anthropometric and dietary characteristics (n = 132)

Age (years) mean + SD (min-max)	34.61 + 13.5 (18-72)
18-25 n (%)	38 (28.79)
26-35 n (%)	42 (31.82)
36-45 n (%)	25 (18.94)
> 45 n (%)	27 (20.45)
Gender Female, n (%) / Male, n (%) 51(38.64) / 81(61.36)	
Body Mass Index(BMI) (kg/m²) mean + SD (min-max) 23.75 + 4.15 (18.5-55.8)	
BMI 18.5 – 22.9 n (%)	101 (76.52)
BMI 23 – 24.9 n (%)	24 (18.18)
BMI >25 n (%)	7 (5.30)
Married n (%) / Single n (%)	80(60.61) / 52(39.39)
Vegetarian n (%) / Non vegetarian (%)	44(33.33) / 88(66.67)
Normal Diet n (%) / Therapeutic Diet n (%)	116(87.88) / 16(12.12)
Occupation	
Employed n (%)	55
Unemployed n (%)	46
Students n (%)	31
Patients discharged n (%) / Transferred in ICU n (%)	125 (94.7%) / 07(5.3%)

Table 2: Food portion size, meal frequency and number of food groups

Portion Size	
Increase, n (%)	59 (44.70)
Decrease, n (%)	25 (18.94)
No Change, n (%)	48 (36.36)
Frequency	
Increase, n (%)	55 (41.67)
Decrease, n (%)	39 (29.55)
No Change, n (%)	38 (28.79)
Number of food groups	
Increase, n (%)	64 (48.48)
Decrease, n (%)	16 (12.12)
No Change, n (%)	52 (39.39)

3. Discussion

In the case of COVID-19, health-care professionals and scientists around the world have noted a rise in reports of smell and taste impairments. A brief report of 88 patients hospitalized with SARS-CoV-2 infection in Italy found that

Table 3: Major meal consumption trends

Breakfast	
Increase, n (%)	71 (53.79)
Decrease, n (%)	42 (31.82)
No Change, n (%)	19 (14.39)
Lunch	
Increase, n (%)	74 (56.06)
Decrease, n (%)	35 (26.52)
No Change, n (%)	23 (17.42)
Dinner	
Increase, n (%)	75 (57.25)
Decrease, n (%)	35 (26.72)
No Change, n (%)	21(16.03)

Table 4: Change in portion size of food groups

Cereals,	
Increase, n (%)	01(00.76)
Decrease, n (%)	73 (55.30)
No Change, n (%)	58 (43.94)
Pulses/legumes	
Increase, n (%)	75 (56.82)
Decrease, n (%)	56 (42.42)
No Change, n (%)	1 (0.76)
Milk & its products	
Increase, n (%)	71 (53.79)
Decrease, n (%)	60 (45.45)
No Change, n (%)	01 (00.76)
Fruits	
Increase, n (%)	78 (59.09)
Decrease, n (%)	54 (40.91)
No Change, n (%)	00(00.00)
Vegetables	
Increase, n (%)	75 (56.82)
Decrease, n (%)	57 (43.18)
No Change, n (%)	00 (00.00)
Oils/Fats	
Increase, n (%)	00 (00.00)
Decrease, n (%)	86 (65.15)
No Change, n (%)	46 (34.85)
Herbs & Spices, n (%)	
Increase, n (%)	72 (54.55)
Decrease, n (%)	60 (45.45)
No Change, n (%)	00 (00.00)
ONS intake, n (%)	
Increase, n (%)	104 (78.79)
Decrease, n (%)	07 (5.30)
No Change, n (%)	21 (15.91)

Table 5: The frequency (%) of portion size, frequency of eating, no of food groups in the surveyed group (n=13) across the BMI groups

	Normal Weight	Over weight	Obese	Pearson's χ^2
Portion size	44.70	18.94	36.36	> 0.05
Increase in overall number of food groups	12.12	48.48	39.39	> 0.05
Increase in number of food groups (Breakfast)	53.79	31.82	14.39	> 0.05
Increase in no of food Groups (Lunch)	56.06	26.52	17.42	> 0.05
Increase in no of food groups (Dinner)	57.25	26.72	16.03	> 0.05
Taste issues	22.73	43.18	534.09	< 0.05
Smell issues	28.03	55.30	16.67	> 0.05

34% reported at least 1 olfactory or gustatory complaint. Ninety percent of these chemo sensory impairments occurred prior to hospitalization, and all participants reported that symptoms persisted to the time of the survey was conducted 10 to 21 days later (median of 15 days).⁷ Studies in the United States and across Europe have also highlighted smell and taste dysfunction in COVID-19 patients. Despite the critical importance of the chemical senses in daily life, they remain understudied in the context of health and disease.^{8,9} Brugliera *et al.*, (2020), in an Italian study reported that implementation of systematic management of the nutritional intake of COVID-19 patients is essential to guarantee an optimal nutritional status and to improve clinical outcomes.¹⁰ Cintoni *et al.*, (2020), from Italy also reported of personalized meal provision combined with oral nutritional supplements, to all oral-feedable COVID -19 patients¹¹ However, in the present study majority of patients reported an increase in dietary intake of number of protective food groups and reduction in portion size of cereals and fats/oils and preferred adding high protein nutrition supplements (ONS).

Ammar *et al.*, (2020), in a study conducted in Germany reported that food consumption and meal patterns (the type of food, eating out of control, snacks between meals, number of meals) were more unhealthy during confinement.¹² A study conducted in the United States reported that 28.3% reported eating healthier food since the beginning of pandemic, while 24.8% reported eating less healthy food.¹³ Self-reported dietary changes among Los Angeles County adults during the COVID-19 pandemic was also reported.¹⁴ In a six countries study, it was found that compared with participants who reported following low carbohydrates, high protein plant based diets or pescatarian diets were associated with lower odds of moderate to severe

COVID-19.¹⁵ In the present study, it was observed that being overweight and obese correlated with taste issues. Review of literature further suggest that prevalence of comorbidities in the COVID -19 patients and found that underlying diseases may be risk factors for patients.^{16–18}

4. Conclusions

An overview of eating patterns of non-critical COVID-19 patients under hospital quarantine, provided an insight regarding their current dietary trends. However, keeping in view of the finding that being overweight and obese correlated with taste issues (Pearson's $\chi^2 < 0.05$), strategic dietary approaches in a hospital setting are essential to potentially modify the negative effects of social isolation/quarantine particularly in these patients.

This is a small study with a limited number of patients. Further studies, preferably prospective randomized controlled trials are advocated with the co-operation of multi-disciplinary teams to further determine long term nutritional impact of COVID-19 during hospital quarantine.

5. Source of Funding

None.

6. Conflict of Interest

None.

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