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A Study Of Chronic Pulmonary Obstructive Disease & Nutritional Support To Patients At A Tertiary Care Centre IGMC Shimla, India

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Abstract
As a result of the disease's symptoms and persistent, systemic inflammation, chronic obstructive pulmonary disease (COPD) mostly affects the lungs, but it also has numerous extrapulmonary repercussions, such as intricate physical and metabolic changes. Diminished exercise ability, elevated nutritional needs, modified metabolic processes, and inadequate dietary intake have all been linked to these alterations. This means that nutritional depletion in COPD is complex and can include energy imbalances (weight loss), protein imbalances (sarcopenia), and periods of noticeably elevated inflammation (pulmonary cachexia), all of which can exacerbate nutritional losses. This means that there may be a loss of fat-free mass (FFM) as well as fat-mass (FM). There is strong evidence that energy and protein imbalances can be corrected with nutritional support, in the form of oral nutritional supplements (ONS), improving nutritional status and functional ability. However, it is likely that focused multi-modal therapies are needed to address energy and protein imbalance, particular dietary deficiencies, lowered androgens, and targeted exercise training in order to treat the aetiology of sarcopenia, frailty, and cachexia. Moreover, disease-course-based therapies are probably the key to successfully treating the prevalent and expensive issue of nutritional depletion in COPD.

Keyword: Nutrition, Diet, Chronic Obstructive Pulmonary Disease

INTRODUCTION

One prevalent lung condition that impairs breathing and restricts airflow is chronic obstructive pulmonary disease, or COPD. Some refer to it as chronic bronchitis or emphysema. An assortment of illnesses that result in airflow obstruction and breathing difficulties are collectively referred to as chronic obstructive pulmonary disease, or COPD.

Definition of Chronic Obstructive Pulmonary Disease (COPD)

An ongoing inflammatory lung condition that prevents air from leaving the lungs might be called chronic obstructive pulmonary disease (COPD). A cough, sputum production, wheezing, and difficulty breathing are among the symptoms. Inflammatory gasses or particulate matter, most frequently from cigarette smoke, are the usual cause of it after prolonged exposure. In addition to a number of other illnesses, people with COPD are more likely to develop heart disease and lung cancer.

COPD is mostly caused by two main conditions: emphysema and chronic bronchitis. Individuals with COPD may have varying degrees of severity for these two illnesses, which typically coexist.

Chronic Bronchitis is Inflammation of the bronchial tubes, which transport air to and from the lungs' air sacs (alveoli). Daily coughing and sputum (mucus) production are its defining characteristics.

Emphysema is a disease wherein the lungs' alveoli, located at the end of their tiniest air channels (bronchioles), are destroyed due to harmful exposure to tobacco smoke and other irritating gases and particulate matter.
Despite being a progressive illness that deteriorates with time, COPD is curable. Most COPD patients can obtain good symptom control and quality of life, as well as a lower chance of developing other related disorders, with appropriate management.

Reasons for COPD
The two main causes of COPD are air pollution and smoking. Individuals who have COPD are more vulnerable to various health issues. Although COPD cannot be cured, symptoms can lessen if a person stops smoking, protects themselves from air pollution, and receives vaccinations to fend off infections. Additionally, oxygen, medications, and pulmonary rehabilitation can be used to treat it.

Factors at risk
Although smoking is one of the main risk factors for getting COPD, persons who never smoke may also develop the disease, which is why COPD is sometimes referred to as a "smoker's disease." Additional risk variables could be:

* A history of respiratory illnesses in children
* Individuals with a history of asthma
• Smoke exposure from coal or wood-burning stoves
• Secondhand smoke exposure
• People with undeveloped lungs
* People over 40, as aging causes a decrease in lung function
COPD is more common among those who are impoverished and reside in rural areas. Aside from smoking, other factors that may contribute to an increased risk of COPD development include occupational exposures, exposure to indoor and outdoor pollution, and limited access to healthcare.

Indications and Expressions
Breathing is difficult with COPD. At initially, the symptoms could just be slight coughing fits and breathlessness. The symptoms may worsen over time and become more persistent, making breathing more and more difficult. initial signs. The early signs of COPD can be rather minor.

Early signs and symptoms consist of:
- Mild but persistent cough
- Occasional dyspnea, particularly after physical activity
- Subtle behavioral changes, like avoiding stairs and avoiding physical activities.

Symptoms that get worse include:
- Dyspnea, a higher-pitched, noisy breathing pattern, particularly during exhalations
- Dyspnea even after minor exercise, such as climbing stairs.
- Chest tightness
- Persistent coughing, either clear or mucus-producing
- Daily lung clearance required
- Recurrent colds, the flu, or other respiratory infections

- Low energy

Symptoms of COPD in its later stages could also include:

- Exhaustion
- Legs, ankles, or feet edema
- Weight loss

REVIEW

Chronic obstructive pulmonary disease (COPD) is a common lung disease causing restricted airflow and breathing problems. It is sometimes called emphysema or chronic bronchitis. In people with COPD, the lungs can get damaged or clogged with phlegm. Symptoms include cough, sometimes with phlegm, difficulty breathing, wheezing and tiredness. Smoking and air pollution are the most common causes of COPD. People with COPD are at higher risk of other health problems.COPD is not curable but symptoms can improve if one avoids smoking and exposure to air pollution and gets vaccines to prevent infections. It can also be treated with medicines, oxygen and pulmonary rehabilitation (World Health Organization, 2023).

Chronic obstructive pulmonary disease (COPD) represents an increasing burden throughout the world. COPD-related mortality is probably underestimated because of the difficulties associated with identifying the precise cause of death. Respiratory failure is considered the major cause of death in advanced COPD. Comorbidities such as cardiovascular disease and lung cancer are also major causes and, in mild-to-moderate COPD, are the leading causes of mortality (European Respiratory Journal, 2006).

Chronic obstructive pulmonary disease (COPD) is a common disease with high global morbidity and mortality. COPD is characterized by poorly reversible airway obstruction, which is confirmed by spirometry, and includes obstruction of the small airways (chronic obstructive bronchiolitis) and emphysema, which lead to air trapping and shortness of breath in response to physical exertion. The most common risk factor for the development of COPD is cigarette smoking, but other environmental factors, such as exposure to indoor air pollutants — especially in developing countries — might influence COPD.

Chronic obstructive pulmonary disease (COPD) is one of the most common non-communicable diseases with the potential to be life-threatening. It is caused primarily by tobacco smoking and air pollution (Eisner MD, Anthonisen N, Coultas D et al., 2010). According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD), COPD is a common, treatable and curable disease. COPD is now the third major cause of mortality globally and is expected to reach the top of the list over the next decade.

According to (G. Rawal, 2015) the association of weight loss and muscle wasting in COPD patients have been shown to increase morbidity and mortality. It has also been observed that COPD patients with an initial body mass index (BMI) of less than 20 kg/m2 or weight loss during the one-year follow-up period have a higher risk of acute exacerbations with a high mortality rate as compared to COPD patients with a BMI of 20 kg/m2 or greater or no weight loss. (Hallin R, Koivisto-Hursti et al., 2006).

The poor diet quality and the nutrient deficiencies in COPD, which are related to disease-specific factors such as symptoms (e.g., dyspnea, fatigue, anxiety, depression, anorexia, periodontal disease, loss of taste, poor dentition, dysphagia, poor chewing and swallowing ability) or social problems (e.g., living or eating alone, or poverty), require improvement through dietary intervention to satisfy nutritional requirements and even to supplement further protective factors able to counteract disease pathogenesis. The inflammatory/oxidative status in COPD and the associated procatabolic state contributing to weight loss and muscle wasting in severe COPD represent further possible targets for nutritional intervention (E Scoditti 2019).

Method And Materials

An evaluation of the eating patterns and nutritional state of patients with recently diagnosed chronic obstructive pulmonary disease (COPD) at the pulmonary ward of the IGMCH, Shimla.

Study Location

The 110 patients with newly diagnosed chronic obstructive pulmonary disorders (COPD) in the age range of 20 to 90 years who were registered at the pulmonary ward of IGMCH Shimla—60 females and 50 males—were the subjects of the current study.

TOOLS

There were two components to the tool:

• Addresses demographic information such as age, gender, family structure, education level, history of hypertension in the family, and prior hospital stays.

* It asks about a variety of personal habits and lifestyle choices, such as eating habits, drinking habits, smoking, and awareness of health conditions and their treatments.

Data Collection

The MS IGMC and the HOD of pulmonary medicine at the IGMC Shimla granted permission to perform the study in the pulmonary ward of the IGMCH. For the purpose of gathering data, each patient with chronic obstructive pulmonary disease (COPD) was considered and individually, face-to-face interviews were conducted in accordance with the questionnaire. Consent was obtained after informing the samples about the nature and goal of the investigation. The patients were instructed on how to complete the questionnaire. The patients were interviewed one-on-one for a minimum of half an hour to ask the questions. The following were included in the questionnaire:

General details

This component had the following information: name, gender, age, marital status, education, occupation, family history, dietary and personal habits, and socioeconomic position.

The Patient's Profile

For patients receiving care indoors, information about chronic obstructive pulmonary disease (COPD) was gathered from the patient and their attendant. Information on dietary intake was gathered from patients and their attendants using a three-day dietary recall approach. The dietary recall for the indoor patient was taken from the hospital's diet charts.

Medical history

This included the patient's overall and medical look. The following signs and symptoms of chronic obstructive pulmonary disease (COPD) were checked for in the patients: blood in sputum, weakness, weight loss, shortness of breath, chest pain, cough, and nighttime fever.

Three-Day Dietary Recall

The three-day dietary recall for hospitalized patients was taken from hospital menu charts, and those who were not in the hospital were interviewed in the pulmonary ward. The patient's three-day dietary recall comprises the following: energy protein, carbohydrates, lipids, beta-carotene, calcium, iron, riboflavin, and niacin.

Measuring anthropometry

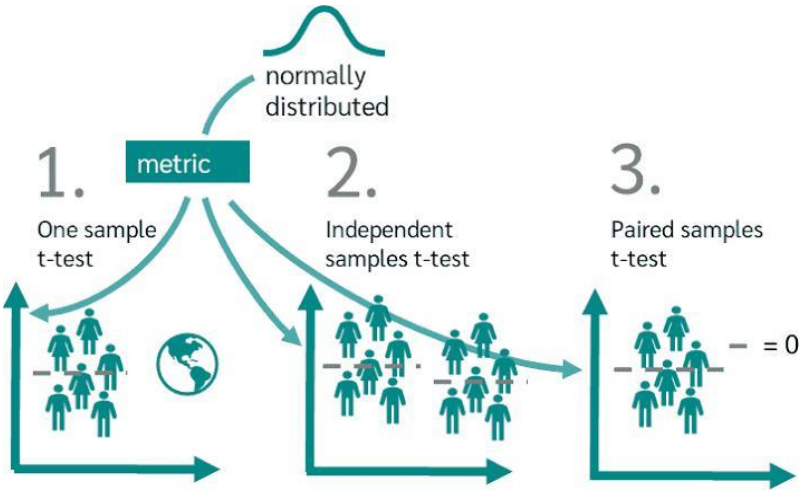
Height: A thin, flexible, non-stretchable measuring tape will be used to take the measurement. Patients are required to stand along the wall with their feet parallel to the wall and their heels, buttocks, shoulders, and back of the head touching the wall during the measurement. The head needs to be supported comfortably upright. By lowering a measuring tape from a level platform that will be held on top of the head, height will be measured in centimeters. The closest measurement of height was 0.1mm.

Weight: The weight will be measured using a conventional stand-on scale weighing apparatus. A known weight will be applied to it on a regular basis to standardize it. The patient will be required to stand in the middle of the platform on a shoeless machine, touching nothing. Weight will be taken at registration and once more when therapy is finished. The nearest weight was used while measuring.One kilogram.

BMI: Using a formula, each patient's BMI will be determined during registration based on their weight and height data.
According to WHO guidelines, the cases were categorized based on BMI as follows:

- Mild underweight: 17–18.49
- Moderate underweight: 16–16.99
- Severe underweight: <16.00
- Pre-obese: 25–29.9
- Normal: 18.5–24.9
- Obese: ≥30

Following the completion of all measurements, we will use the three-day dietary recall method to compare the patient's daily dietary consumption with the required daily allowances.
Interviewing the respondents about their food for three days in a row allowed researchers to evaluate the dietary consumption of patients with chronic obstructive pulmonary disease (COPD). Additionally, the data collection process covered junk food, nuts and oilseeds, fats, and edible oils. The frequency of consumption of the food groups by the patients was inquired about: daily, weekly, rarely, or occasionally. Rather than focusing on specific foods, the interviewees were asked about food groups. By matching the intakes with the Recommended Dietary Allowances (RDA) (ICMR, 2010), the patients' nutritional intakes were assessed for adequacy. The RDA was used to compare the mean intake of various food items.

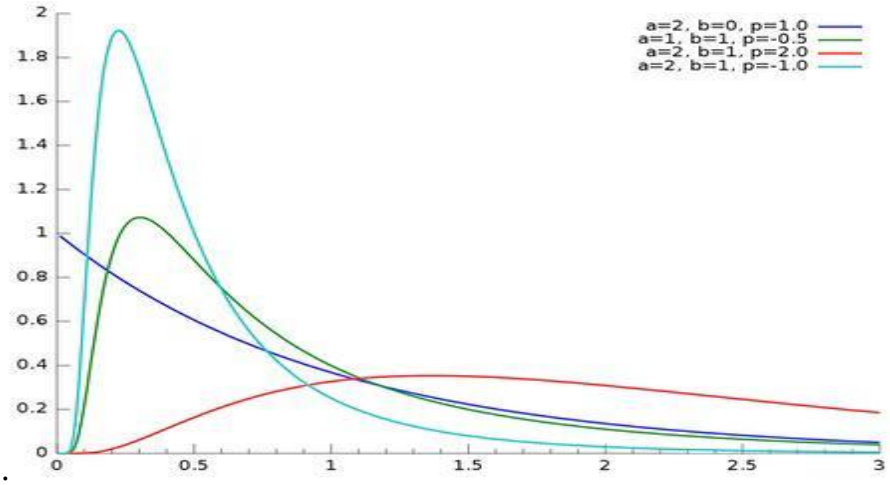


The collected data was evaluated for mean, percentage, standard deviation, and the significance of the difference between the two groups was tested using the t test.

Analytical statistics
Mean: The average of all numbers is known as the mean. By dividing the sum of all values by the total number of values, one can determine the mean of the set of observations or measures

Standard deviation: A metric used to express how much a set of data values vary or are dispersed is the standard deviation. A low standard deviation suggests that the data points are generally near the set's mean, also known as the anticipated value, whereas a high standard deviation suggests that the data points are dispersed throughout a larger range of values.
$S = \sqrt{\sum}(x-X) / N$
Where S = Mean of sample
N= size of sample

F-test: It is applied when the variance and standard deviation of two populations with normal distributions are equal. The percentage, mean, and standard deviation were computed to assess the amount of food and nutrients. The independent relationship between height, weight, and BMI was examined following a multivariate analysis. To incorporate the variables into the multivariate analysis, the AN F-test was examined at the 0.05 to 0.01 level. In every analysis, the acceptance of the hypothesis and rejection of the null hypothesis was based on the significance value



$F = \sigma 1 \sigma 2$, or Variance 1/Variance 2

Result And Discussion
This research was conducted among the sample of 110 (60 males and 50 females) Chronic obstructive pulmonary disease (COPD) patients. The objectives was to assess Nutritional status and Dietary pattern of Chronic obstructive pulmonary disease (COPD). The sample data was collected during the year October 2023 to March 2024 from the pulmonary medicine Department of IGMCH, Shimla

1. General Information
Table 1.3 Distribution on Basis of Gender Distribution

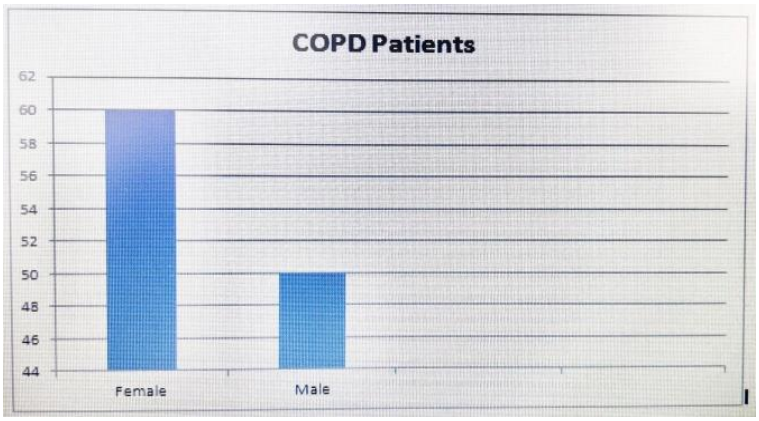


Fig 1.3 Percentage of Male and Female Patient

According to the fig 1.3 numbers of female patients (60per) is more than the male patient (40per). In my research males are more or equally infected with chronic obstructive pulmonary disease (COPD). Fig.4.1 The female to male ratio in patients of chronic obstructive pulmonary disease (COPD) was 2:1.

The greater incidence of COPD in women than men. Because men smoke at a higher rate than women, chronic obstructive pulmonary disease (COPD) was traditionally thought to primarily affect older men. But times have changed, and women are now frequently diagnosed with COPD due to the steadily rising rate of female smoking. Indeed, the rise in women with COPD over the past few decades has contributed to a rise in the disease's morbidity and death. Women are now more likely than men to have COPD in many wealthy nations.
Non-cigarette risk factors account for a sizable and increasing portion of the worldwide burden of chronic obstructive pulmonary disease (COPD). Moreover, hospitalization and death from respiratory failure and co-morbidities are more common in women with severe COPD (European Respiratory Review 2022). In the majority of low-income nations, the gender ratio of COPD cases is almost 2:1. biological traits as well as societal and cultural impediments to health access are to blame. Males are more or equal to females in this study

Risk Factor

Table1.4: Demographic distribution of patients

	Male		**Female**	
	Number	**Percentage**	**Number**	**Percentage**
Smoking				
Daily	33	66	20	33.33
Occasionally	10	20	2	3.33
None	7	16	38	63.33
Alcohol Misuse				
Yes	40	80	8	13.33
No	10	20	52	86.66
Type of dwelling				
Brick	30	60	37	61.66
Tin	2	4	4	6.66
Plank	10	20	10	16.66
Other	8	16	9	15
Number of people living in house				

1-4	25	50	20	34
5-8	12	24	28	46
>8	13	26	12	20
Drinking Water				
On tap	40	30	48	80
Communal tap	10	20	12	20
Bore Hole	00	00	00	00
Type of toilet				
Flushing	45	90	50	84
Pit	5	10	10	16
Bucket	00	00	00	00
Fuel of Cooking				
Electric	5	10	10	16.66
Gas	20	40	10	16.66
Wood	25	50	40	60.66
Education				
Illiterate	7	14	2	3.33
Primary	18	36	10	16.66
Higher education	25	50	48	80
Employment Status				
Unemployed	12	24	28	46.66
Self employed	18	36	20	33.33
Wage earner	20	40	12	20
Total Money spent on Food				
0-1000	10	20	17	28.33
1000-2000	06	12	10	16.66
2000-3000	09	18	18	30
>3000	07	14	10	16.66
Unknown	18	36	05	8.33

Smoking

According to Table 1.4, smokers are more likely to contract tuberculosis. The smoking rate was 40% for women and 80% for men. Women made up the remaining 60% who did not smoke. According to this study, smokers are more likely to get pulmonary tuberculosis.

Alcohol Misuse

Only 20% of the male respondents, or 80% of them, reported occasionally drinking alcohol, according to Table 1.4. Of the respondents who were female, 13.3% were alcoholics, whereas the remaining 86% were not.

Overindulgence in alcohol has been shown to reduce immunity, which can result in pulmonary tuberculosis. According to every meta-analysis, drinking alcohol was linked to a higher probability of developing tuberculosis, and as a result, it significantly enhanced the disease's burden

BMI

The majority of cases, or 73 (66.36 percent), were undernourished, based on BMI table 1.5. 35 (31.81%) of the men and 38 (34.54%) of the women. According to BMI classification, none of the adult study group members were obese, defined as having a BMI of 30 or more. 37.00 percent, 12.00 percent, and 21.81 percent of the 73 percent of undernourished adults, respectively, suffered from mild, moderate, and severe malnutrition. Compared to male cases, there were more cases of

severe malnutrition in females; of these, 17 cases (15.54 percent) showed extreme thinness with a BMI of less than 16.00. See Table 1.5.

Table 1.5; Classification of adult underweight, overweight and obesity according to BMI

Classification	**Principle cut off point**	**Male**		Female		**Total**	
		No	**%**	**No**	**%**	**No**	**%**
Severe thinness	<16	7	14	17	28.33	24	21.81
Moderate thinness	16.00-16.99	6	12	6	10	12	10.90
Mild Thinness	17.00-18.49	22	44	15	25	37	33.63
Normal range	18.50-24.99	15	30	19	31.66	34	30.90
Pre-obese	25-29.99	0	0	2	3.33	2	1.81
Obese	>30	0	0	1	1.66	1	0.90

BMI of Different Age group

None of the research age group had a BMI of 30 or more, indicating that they are obese. This indicates that all age groups were malnourished, but notably the females aged 15 to 20 who had a BMI of less than 16. In addition to having mild to moderate malnutrition, males and females in the 20–35 age range also had pulmonary tuberculosis. Women experience a higher percentage of undernourishment than men do. But the productive age group (20–35 years) needs special care because both males and females are moderately to severely undernourished. In Table 1.6 (figure 1.5).

Table 1.6: Nutritional status distribution of case in different age group according to BMI

Age group	**Female**	**Female BMI**	**Male**	**Male BMI**
15-20	13	15.71	5	16.68
21-25	9	17.05	4	17.78
26-30	9	17.73	7	19.28
31-35	5	17.08	2	19.42
36-40	3	18.64	2	20.31
41-45	2	22.57	6	19.67
46-50	5	18.78	10	18.28
51-55	2	25.83	2	18.94
56-60	1	19.88	4	18.9
61-65	3	20.76	2	18.09
66-70	1	17.1	1	19.54
71-75	3	19.36	2	20.26
76-80	2	17.74	1	19.88
81-85	1	17.77	2	18.15
86-90	1	14.21	0	0

Fig. 1.7: Nutritional status distribution of cases in different age group according to the result of both male and female BMI

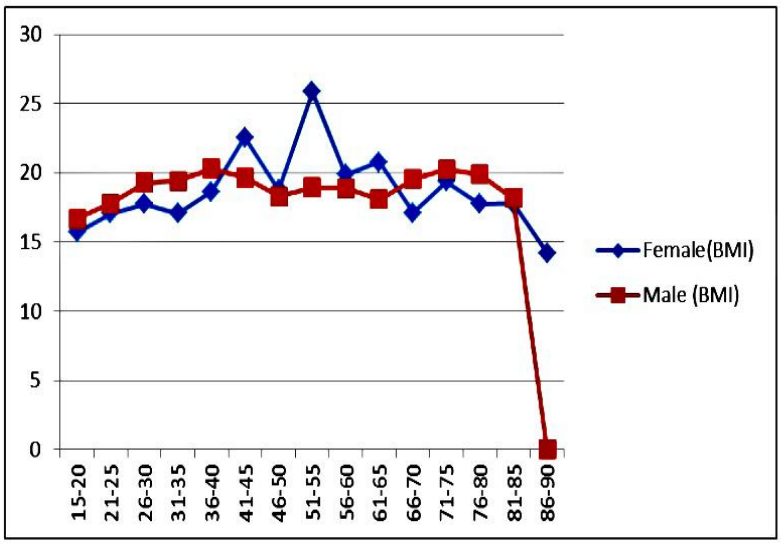


Table 1.7: Height, Weight and Body Mass Index of Pulmonary Tuberculosis Patients of Male and Female

Parameters	**Male (n=60) Mean ± SD**	**Female (n=40) Mean ± SD**	**F- Test**
Height (cm)	170.7 ± 8.34	158.5 ± 8.45	0.189
Weight (kg)	52.24 ± 8.09	46.67 ± 10.41	0.337
BMI (Kg/m2)	17.9± 6.41	18.59 ± 3.61	0.176

Significant at 0.01% and 0.05% level of significance

Height

Table 1.7 shows the mean heights of the boys and females, which were 163 ± 6.18 cm and 156 ± 4.14 cm, respectively. The table values are 1.26 and 1.39 for the significance levels of 0.05 and 0.01. We conclude that there is no significant difference in the mean height of boys and girls, rejecting the null hypothesis because the estimated F-value of 0.188 is smaller than these table values.

Weight

Based on Table 1.7, the average weight of the males was 59.8 ± 9.22 kg, and the ladies' weight was 57.82 ± 6.45 kg. The table values are 1.26 and 1.39 for the significance levels of 0.05 and 0.01. There is a substantial difference between males and females because the computed F-value of 0.337 is less than these table values.

BMI

Male and female BMI values were 25.9 ± 12.06 kg/m2 and 23.47 ± 2.29 kg/m2, respectively, as shown in Table 1.7. Male BMI was found to be higher than female BMI within the usual range of 18.5-24.9 provided by the World Health Organization. We reject the null hypothesis and come to the conclusion that there is a significant difference in the mean BMI of boys and females when we compare the value of 'F' at the 0.01 level of significance with the calculated value (0.174). This is because the calculated value is less than the tabulated value (1.39).

Daily consumption of food

Both responders consumed 100% of the daily allotment of wheat and rice in terms of grains. Males consumed 40% of their daily grams of pulses. In contrast, only 7% of males occasionally consumed,

10% did so every two weeks, and 36% did so regularly. Of the female patients, 41.66 percent ingested grams on a daily basis, whereas 33.33 percent, 16.66 percent, and 8.33 percent consumed grams on a weekly, fortnightly, and seldom basis. Neither of the responders ate peas every day. Male consumption of peas was about 40%, 30%, and 20% weekly, fortnightly, and sporadically, whereas female consumption was about 50%, 20%, and 13.33% weekly, fortnightly, and intermittent. Male consumption of lentil was 10 percent weekly and 14 percent biweekly, while 56 percent of lentils were used on a daily basis. For the female respondents, the percentage of them who eat lentils daily was 53, while the percentage who consumed them weekly, fortnightly, and sometimes were 15, 18, 33, and 13. 33. Legume was not a daily food for any man or woman. The percentage of rest that men eat on a weekly basis is thirty percent, fifty percent, and twenty percent, respectively. Weekly, fortnightly, and sporadically, respectively, these were 33.33 percent, 50 percent, and 16.66 percent in the female category.

For example, among male respondents, 24 percent, 50 percent, 26.66 percent, and 10 percent reported consuming green leafy vegetables, roots and tubers, and other vegetables on a daily, weekly, fortnightly, and sporadic basis. Green leafy vegetables were consumed regularly, weekly, fortnightly, and sporadically by females, accounting for 23.33 percent, 26.66 percent, 12 percent, and 40% of the sample. When it comes to the frequency of daily intake of milk and milk products, the percentages for men and women are 68 and 70 percent, respectively. In the case of men, the percentages are 12 and 10 percent weekly and biweekly, and 15 and 8.33 percent weekly and sometimes. Male and female intake frequencies of fats and oils are 92.66% and 91.66% daily and 6.3% and 8.3% weekly, respectively. Male consumption of nuts, oil seeds, and non-vegetarian foods included 40%, 30%, 8%, 10%, and 15% of daily, weekly, fortnightly, and sporadic consumption, respectively, and 20%, 30%, and 4% of egg, meat, and fish consumption. Regarding women, thirty percent, thirty percent, eleven sixty-six percent, and ten percent of them eat nuts every day, every week, every two weeks, and sometimes; likewise, twenty percent, thirty percent, and twenty-three percent follow a non-vegetarian diet every day, every week, and every two weeks, respectively. Table 1.8 displays the daily caloric consumption of the male and female.

Table 1.8: The Daily Food Intake of Male and Female

Sr. No.	Food stuff	Daily		Weekly		Fortnightly		Occasionally	
		Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)
1	**Cereals**								
	Wheat	50(100)	60(100)						
	Rice	50(100)	60(100)						
	Maize	0	0	20(40)	25(41.66)	5(10)	10(16.66)	20(4)	30(50)
2	**Pulses**								
	Legumes	0	0	15(30)	20(33.33)	25(50)	30(50)	10(20)	10(16.66)
	Grams	20(40)	25(41.66)	18(36)	20(33.33)	5(10)	10(16.66)	7(14)	5(8.33)
	Peas	0	0	20(40)	30(50)	15(30)	12(20)	10(20)	8(13.33)
	Lentil	28(56)	32(53)	7(14)	9(15)	5(10)	11(18.33)	0	8(13.33)
3	**Green leafy veg.**	12(24)	14(23.33)	25(50)	16(26.66)	8(16)	6(12	5(10)	24(40)
4	**Roots and tubers**	18(16)	23(38.33)	7(14)	20(33.33)	14(28)	7(11.66)	11(22)	10(16.66)
5	**Other veg.**	29(58)	32(53.33)	12(24)	15(25)	6(12)	00	3(6)	7(11.6)
6	**Fruits**	23(46)	20(33.33)	16(32)	23(38.33)	10(20)	8(13.33)	1(2)	9(15)
7	**Milk and milk products**	34(68)	42(70)	6(12)	9(15)	5(10)	5(8.33)	0	0
8	**Fats and oils**	46(92)	55(91.66)	3(6)	5(8.33)	0	0	0	0
9	**Nuts and oil seeds**	20(40)	18(30)	15(30)	22(36.66)	4(8)	7(11.66)	5(10)	6(10)
10	**Egg, meat and fish**								
	Egg	10(20)	12(20)	15(30)	18(30)	7(14)	14(23.33)	0	0
	Mutton/ chicken	5(10)	0	24(48)	25(41.66)	8(16)	17(28.33)	0	1(1.66)
	Fish	0	0	12(24)	18(30)	0	0	22(44)	28(46.66)
11	**Sugar and Jaggary**	45(90)	52(86.66)	5(10)1	8(13.33)	**0**	**0**	**0**	**0**

For both genders, the daily consumption of grains was 306.6 ±46.6 g and 286± 57.93 g, respectively. For the female group, this was far less than the suggested daily intake of 300 g, but for the male group, it was higher. Males consumed an average of 63.8 ± 15.6 g and females 57.83 ± 16.08 g of pulses per day, respectively. In comparison to females, male consumption exceeded the Recommended Dietary Intake (RDI) of 60 grams. It demonstrated that both groups' consumption of grains and pulses was out of balance due to a lack of understanding about nutrition.

For both genders, the average consumption of green leafy vegetables was 96.4 ± 58.94 and 95.83 ± 51.39 g, respectively. Both groups consumed less green vegetables than the suggested daily allowance of 125 grams. The amount of roots, tubers, and other vegetables consumed each day was less than the RDI (200 g). Both the male and female groups consumed 117.5 ± 60.45 and 112.6 ± 72.51 grams of other vegetables, while the other vegetable consumption was 122.73 ± 73.65 and 116.41 ± 70.87 g for both groups. In both the male and female groups, the values for roots and tubers (200 g), other vegetables (200 g), and green leafy vegetables (120 g) were lower than the typical RDI. Table 1.9

Both male and female patients consume relatively little milk and milk products on a regular basis, i.e. 210+93.67 and 188.75+93.24 ml which is below than RDA 300ml

Table 1.9: Daily food intake of Male and Female patient and RDA

Food	RDA (gm)	Male (n=50) Mean ± SD (gm)	Female (n=60) Mean ± SD (gm)	F-Test
Cereals	240	306,6±46.16	286.1±57.93	0.104
Pulses	60	63.8±15.6	57.83±16.08.	0.641
Green veg	125	96.4±58.94	95.83±51s.39	0.313
Roots and tuber	200	117.5±60.45	112.6±72.51	0.192
Others veg.	200	122±73.65	116.41±70.87.	0.773
Milk and products	300	210±93.67	188.75±93.24	0.967
Egg/meat/ fish	100	108±83.57	67.91±69.23	0.168
Fat and oil	30-50	10.56±6.5	10.23±5.8	0.258
Sugar	20-30	20.77±8.47	29±19.4	2.06
Fruits	60	34±6.85	30±556	0.12

Significant 0.01 to 0.05 level

Mean daily Nutrient Intake of Male and Female

Table 1.10 displayed the daily nutritional intake for both genders. Males consumed 2057±258 Kcal on a daily mean, while females consumed 1753±367 Kcal. These intakes were much lower than the recommended dietary allowance (RDA) of 2900–3000 Kcal. Results indicated a negligible variation in energy intake because the obtained F-value of 0.835 is smaller than the table value. A man's average daily intake of carbohydrates was 375± 25.75 grams. The intake for females was 350+45.67gm. In comparison to the RDA (300–400), male groups consumed fewer carbohydrates. At the significance level of 0.01, the computed carbohydrate value (0.912) is lower than the tabular value 1.39. The amounts of carbohydrates consumed by the samples varies not that much.

Table 1.10: Daily nutrient intake in male and female

Nutrients	RDA	Male (n=50) Mean ± SD	Female (n=60) Mean ± SD	F-Test
Energy (kcal.)	2900-3000	2057±258	1753±367	0.835
Carbohydrates(gm.)	300-400	375± 25.75	350±45.67	0.912
Proteins (gm.)	51-54	58.56±6.99	50.21±8.0	0.873
Fats (gm.)	30	9.21±4.15	8.16±5.27	0.660
Calcium (mg.)	600-1200	600±5.60	650±5.34	0.948
Iron (mg.)	20-32	9± 5.03	8±6.80	0.373
Vitamin D (mcg)	6-10	1±1.02	1±1.04	0.819
Riboflavin (mg.)	1.4- 1.6	1± 0.10	1±.06	0.972
Niacin (mg.)	16-20	14±1.98	13± 2.33	0.924
Zinc (mg.)	10-12	9±1.24	9 ± 3.04	0.833
Selenium (mcg.)	50-70	23±4.1	18±3.3	0.841
Vitamin A (mg.)	600-700	324±332	333±2.4	0.030
Folate (mcg.)	500	130±4.54	128±4.32	0.990

The average daily protein consumption for both genders was 50.21±8.001gm and 58.56±6.99gm. which was far more than the RDA (51–54 grams). As the obtained F-value of 0.873 is smaller than the numbers in the table, it can be said that there is no significant difference between the two groups. A man's fat intake was 9.21±4.15 grams, while a woman's was 8.16±5.27 grams. The RDA (30gm) was exceeded by this. The result indicated a negligible change in the intake of fats because the obtained F-value of 0.660 is smaller than the table values.

Males reported consuming 600±5.60 mg of calcium, whereas females consumed 650±5.34 mg. Male groups consumed enough calcium, but female groups consumed less than the recommended daily allowance (600–1200 mg). The computed calcium value (0.948) is smaller than the tabular value (1.39) at the significance level of 0.01. The samples' consumption of calcium varies not very much.

The average daily iron consumption was 8–9 mg, which was less than the recommended 20–32 mg. The computed value f, at a significance level of 0.01, is 0.373, which is less than the table value that showed no significant differences in mean intake of iron were found.

The average daily intake of vitamin D for both genders was between 1.02 and 1.04 micrograms. It fell short of the recommended daily allowance (6–10 mg). The computed value f, at a significance level of 0.01 (less than the table value indicating no significant difference in vitamin D intake), is 0.819. The recommended dietary allowance (RDA) of 1.4-1.6 grams of riboflavin was significantly exceeded by the mean daily consumption of males (1±0.10 mg) and females (1±.06 mg) in both

cases. The results indicated an insignificant change in the intake of riboflavin because the obtained F-value of 0.972 is smaller than the table value. Males consumed 14±1.98 mg of niacin per day on average, whereas females consumed 13±2.33 mg. Compared to the RDA (16–20 mg), the results were lower. The estimated value of niacin (0.924) is smaller than the tabulated value (1.39) at the significance level of 0.01. The samples dietary consumption of niacin is barely different.

Mean daily intake of Zinc of male was 9±1.24 mg. whereas female intake was 9 ± 3.04 mg. The values were lower than the RDA (10-12mg). At level of significance 0.01 the calculated value (0.833) of zinc is less than the tabulated value (1.39). The samples have insignificant difference in Zinc intake. The daily mean intake of Selenium consumption by male was 23±4.1mcg and female was 18±3.3mcg, which was significantly lower than the recommended dietary allowance RDA (50-70mcg). Since the obtain F-value of 0.841is less than table value, Results showed insignificant difference in the intake of Selenium. Vitamin A intake of male reported was 324±332 mg and female was 333±2.4mg, which was significantly lower than the recommended dietary allowance RDA (600-700mg). At level of significance 0.01 the calculated value (0.030) of Vitamin A is less than the tabulated value (1.39). The samples have insignificant difference in Vitamin A intake.

The average daily intake of folate for both genders varied between 130±4.54 and 128±4.32 micrograms. which was less than the 500 mg RDA. The computed value, f, at the significance level of 0.01 is 0.990, which is less than the table value that showed a non-significant difference in folate consumption

CONCLUSION

Recommendation:

- Rather than recommending three meals a day, six smaller meals are suggested.
- Enough energy and protein should be included in the meals, which should also have a tasty appearance.
- To fulfill the increased requirements, commercially available high-protein and energy beverages that are balanced in terms of micro- and macronutrients can be used efficiently.
- To boost the protein and energy content of cereals, soups, gravies, casseroles, and milk-based drinks without adding to the bulk of the meal, combine common household goods like sugar, vegetable oil, peanut butter, eggs, and non-fat dry milk powder.
- For optimal calcium and vitamin D intake, 500–750 milliliters of milk or yogurt should be drunk per day.
- Aim for five to six servings of fruits and vegetables each day
- Take half a glass of fruit juice, which is equivalent to one item of fruit, to help reduce the majority of the diet.
- Smoking and alcohol use should be avoided.
- Because of the increased losses, it's critical to consume enough fluids (at least 10–12 glasses daily).
- Consume a high-quality multivitamin and mineral supplement that meets 50%–150% of the daily required amount.
- Continue to prioritize environmental sanitation
- Maintaining good personal hygiene and handling food safely are crucial.
- Steer clear of raw meat, eggs, and fruits.
- Prevent crowding and maintain good ventilation in the home

Limitation

- The current study was limited to the IGMCH, Shimla pulmonary medicine ward.
- For a brief six-month period, a study involving just 100 individuals was carried out**.**

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