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Assessment of Nutritional Status among Young Adults in Gurugram (Haryana), India

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ABSTRACT

Assessing nutritional status is essential, whether to determine if a person has a nutritional imbalance stemming from an underlying issue or to evaluate the likelihood of developing a pathological condition as a result of nutritional imbalance. Poor nutrition can lead to the onset or advancement of numerous diet-related diseases such as obesity, type 2 diabetes mellitus, metabolic syndrome, anemia, and high blood pressure. As per the WHO report (2016), in India, 23.6% of young adults aged 18 and above are underweight, while 19.7% are classified as overweight. This research was conducted to evaluate the eating habits and nutritional health of young adults residing in Manesar city in Gurugram. A cross-sectional study was carried out to investigate the anthropometric profile and nutritional status of young adults, based on body mass index (BMI) and 24hr.diet recall method and using FFQ (food frequency questionnaire). The nutrients intake was analysed through a software Diet-cal. The anthropometric profile, which includes height, weight, and BMI, was recorded for 500 young adults, both male and female, selected via a snowball sampling technique. Data collection utilized pretested, structured self-administered questionnaires. Data analysis was performed using the SPSS statistical package (version 20.0). In this research, following the WHO (2008) BMI classification for adults, it was revealed that 6.8% of males and 6.4% of females were underweight, while 34.4% of males and 25.4% of females were identified as overweight. The most common food groups consumed daily by the respondents include cereals, legumes, pulses, root vegetables, tubers, cooking oils, and fats. Conversely, only 21% and 24% of the total participants consumed green leafy vegetables and fruits while sugar intake was 40% daily, respectively. Males exhibited higher nutrient intake, including protein, carbohydrates, and energy, compared to females were

having high intake of fat. Evaluating nutritional status provides a more in-depth view of nutrient intake within a population. Poor nutritional status among young adults has been identified as a lifestyle challenge, they confront.

Keywords: young adults, Nutritional status, BMI, FFQ

I. INTRODUCTION

The term "Nutritional status" is used to describe a person's health concerning their ability to satisfy their nutritional needs, which are influenced by their age, sex, activity level, and physiological conditions, as well as the quantity and quality of food they eat. To assess the nutritional status of adults, anthropometric measurements such as height, weight, BMI, waist-to-hip ratio, and a 24-hour dietary recall using an oral questionnaire method can be utilized. A good nutritional status indicates the consumption of a balanced diet that provides all necessary nutrients to fulfil the body's needs for maintaining good health. Conversely, poor nutritional status involves either insufficient intake (undernutrition) or excessive intake (overnutrition), as well as ineffective utilization of nutrients to satisfy the body's requirements. This condition can be prevented or addressed by adhering to a healthy and balanced diet throughout the life course. Poor nutrition and unhealthy diets are among the leading global risk factors for these diseases. Making dietary changes can impact not just immediate health but also influence the emergence of Non-Communicable Diseases (NCDs) like cardiovascular disease, respiratory disorders, and cancers such as those of the breast, colon, prostate, kidney, and gallbladder. Furthermore, osteoarthritis is a significant contributor to disability and a critical risk factor for other chronic diseases and type 2 diabetes later in life. Essential nutrients fall into six categories: carbohydrates, proteins, lipids, minerals, vitamins, and water. It is particularly vital to focus on the nutrition and health of young adults, as they bear the responsibility for economic and social support within society.

Young adults are known to have the least healthy dietary habits compared to other age groups, with high levels of soft drink and fast-food intake and a low frequency of following national guidelines for fruit and vegetable consumption. In conclusion, some dietary habits formed by young adults are often linked to inadequate diet quality, including irregular meal schedules, skipping meals, frequent snacking, and the use of commercially prepared foods, particularly pre-packaged items. Insufficient nutrition adversely impacts an individual's physical and mental development, productivity, and the duration of productive years. As a result, it significantly affects social behavior and economic potential.

The objective of this study was to evaluate the nutritional status of young adults by assessing Body Mass Index (BMI) and conducting a 24-hour dietary recall along with food frequency analysis. This involved determining the prevalence of malnutrition and to guide participants in enhancing their nutritional knowledge and overall health status.

II. METHODOLOGY

2.1 Subject Selection

The study was focused on young adults, both male and female, who were free from any physical and mental disorders, aged 18 to 35 years. They were specifically selected from the corporate region of Manesar, Gurugram (Haryana).

2.2 Assessment of Body Mass Index (BMI)

The Body Mass Index is a trustworthy metric for assessing body fatness, determined by an individual's weight and height. Standard techniques were employed to collect weight and height data. BMI is defined as the individual's body weight divided by the square of their height. Participants were classified based on BMI for adults in the current study (WHO, 2008).

Body Mass Index (Kg/m2)	Classification
< 18.50	Underweight
18.5 – 24.9	Normal weight
25.0 – 29.9	Overweight
30.0 – 34.9	Obese grade I
35.0 – 39.9	Obese grade II
>40.0	Obese grade III

2.3 Assessment of nutrients intake

Participants' dietary nutrient information was derived from their 24-hour diet diaries. They were trained to accurately log their consumption by demonstrating the use of standard cups, tumblers, and spoons for serving food and drinks. The intake of nutrients, including protein, fat, carbohydrates, vitamins, minerals, and energy, was assessed using the software Diet-Cal.

2.4 Assessment of food consumption pattern

A standard food frequency questionnaire (FFQ) was utilized to record the consumption frequency patterns of different food products over a specified duration.

2.5 Statistical Analysis

Results are shown as percentages along with mean ± SD. Data analysis was conducted using SPSS version 20, employing appropriate statistical tools and methods. The data collected from dietary assessment is checked for deviation from the recommendations given by NIN & ICMR,2020 dietary guidelines.

(Table-1) Distribution of respondents according to age group

Age groups (Years)	Male		Female		Total	
	No.	%	No.	%	No.	%
18-21	1	0.2	0	0	1	0.2
22-25	49	9.8	27	5.4	76	15.2
26-30	111	22.2	105	21	216	43.2
31-35	102	20.4	105	21	207	41.4
Total	263	52.6	237	47.4	500	100

(Table -2 Anthropometric measurements (Height, weight,) and (BMI) indices of respondent

Nutritional assessment	Male (n=263)	Female (n=237)	Total (n=500)
	Mean ± SD		
Height(cm)	170.74±7.67	161.08±6.72	166.16±11.41
Weight(kg)	76.25±15.29	65.11±12.39	70.97±15.36
BMI (kg/m2)	26.28±5.62	25.22±5.14	25.78±5.42

(Table- 3) Distribution of subjects according to BMI

*BMI classification	Male (n=263)		Female (n=237)		Total(n=500)		Mean ± SD
	No.	%	No.	%	No.	%	
Underweight (<18.5)	34	6.80	32	6.4	66	13.2	16.90±2.88
Normal (18.5-24.9)	57	11.4	78	15.6	135	27.0	22.34±1.45

*BMI classification	Male (n=263)		Female (n=237)		Total(n=500)		Mean ± SD
	No.	%	No.	%	No.	%	
Overweight & Obese (>25)	172	34.4	127	25.4	299	59.8	29.30±3.34

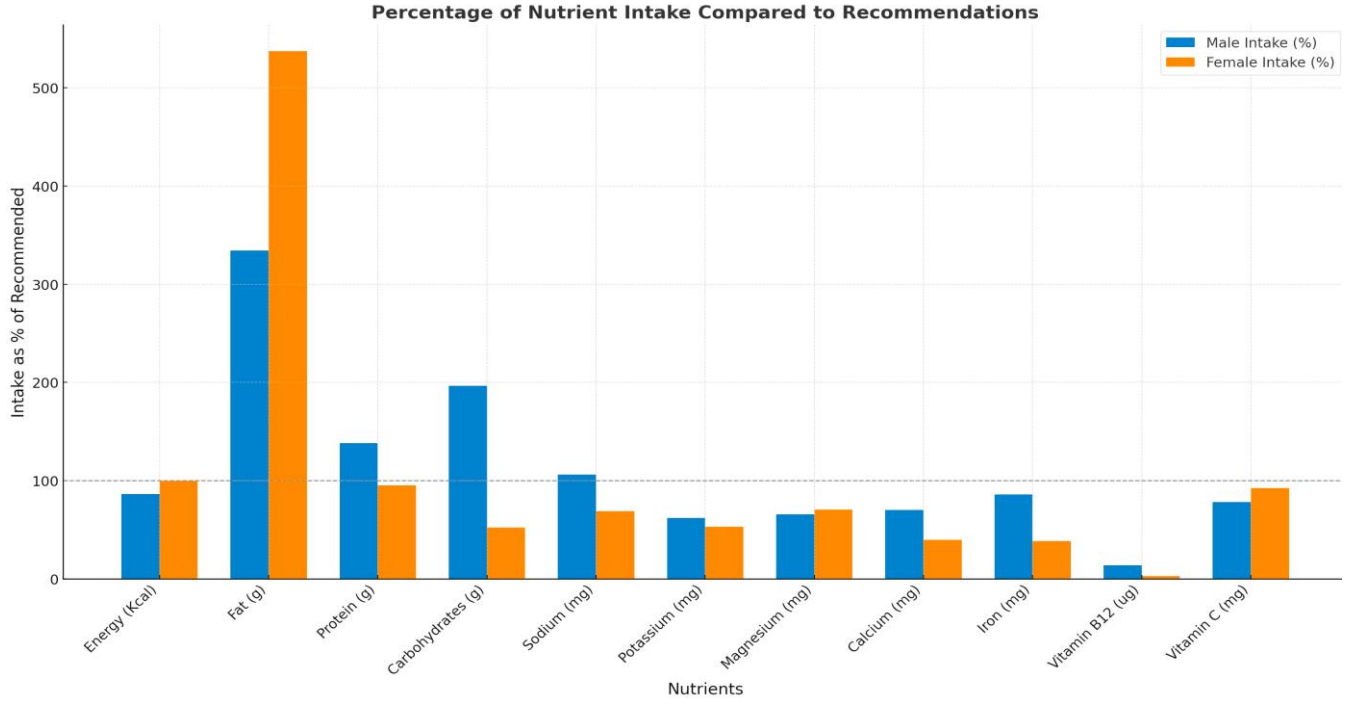
*Note: classification is based on WHO,2008

(Table -4) Daily Mean intake of nutrient comparison with Recommended daily Allowances (RDA)

Nutrients	Male(n=263)		Female (n=237)		Total(N=500)
	Mean ± SD	RDA	Mean ± SD	RDA	Mean ± SD
Protein(g)	82.92 ±42.48	54.0	52.24 ±10.71	45.7	68.23±32.26
Fat(g)	82.48 ±35.08	25	96.97 ±41.66	20	89.35±39.15
Carbohydrates(g)	378.67 ±192.77	192.77	128.89	247.80	319.90±159.34
Energy (Kcal)	2586.06 ±1109.77	2110	2113.92 ±481.90	1660	2362.27±906.47
Sodium(mg)	2121.68±1302.83	2000	1376.36±1195.45	2000	1768.40±1307.17
Potassium(mg)	2173.55±1119.40	3500	1857.30±941.95	3500	2023.65±1052.85
Magnesium(mg)	289.39±115.20	440	260.63±114.73	370	275.76±116.30
Calcium(mg)	699.18±639.591	1000	394.56±338.48	1000	554.79±540.54
Iron(mg)	16.29±8.69	19	11.12±5.72	29	13.84±7.88
Vitamin B12(ug)	0.30±0.21	2.2	0.27±0.20	2.2	0.092±0.13
Vitamin C(mg)	62.53±39.13	80	60.07±43.25	65	61.38±41.13

*RDA for healthy young adults both male 65 kg and female 55 kg: Dietary guidelines for Indian- A Manual, NIN ICMR, Hyderabad,2020.

Figure 1: Percentage of Nutrient intake compared with the daily Recommendation of Nutrients



Source: *RDA for healthy young adults both male and female having weight 55 kg: Dietary guidelines for Indian- A Manual, NIN ICMR, Hyderabad,2020.

(Table -5) Distribution of respondents on the basis of food consumption pattern

Food groups	Food Consumption Pattern											
	Daily		Alternatively		Weekly		Monthly		Occasionally		Never	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Cereal	430	86.0	40	8.00	12	2.40	6	1.20	11	2.20	1	0.2
Legumes &Pulses	200	40.0	123	24.6	65	13.0	77	15.4	15	3.00	20	4.00
Roots & Tuber	370	74.0	65	13.0	35	7.00	10	2.00	-	-	20	4.00
Green leafy vegetable	105	21.0	110	22.0	105	21.0	35	7.00	15	3.00	130	26.0
Other vegetables	135	27.0	175	35.0	80	16.0	15	3.00	20	4.00	75	15.0
Fruits	120	24.0	145	29.0	90	18.0	60	12.0	40	8.001	45	9.0
Milk &milk products	240	48.0	74	14.80	10	2.00	30	6.00	45	9.00	101	20.20
Fleshy food	27	5.40	43	8.60	60	12.0	24	4.80	54	10.80	292	58.40
Sugars	200	40.0	148	29.60	66	13.2	30	6.00	40	8.00	16	3.20
Cooking oil & fats	255	51.0	55	11.0	60	12.0	45	9.00	10	2.00	75	15.0
Nuts & oil seeds	100	20.0	60	12.0	20	4.00	75	15.0	35	7.00	210	42.0
Miscellaneous	310	62.0	110	22.0	45	9.00	25	5.00	5	1.00	5	1.00
Carbonated drink	55	11.0	155	31.0	90	18.0	60	12.0	110	22.0	30	6.00

III.RESULT AND ANALYSIS

The population included for the study comprised of males and females from Manesar Gurugram. Table 1 represents the distribution of respondents into age groups. It can be perused from the table that a larger proportion of the participants among both males and females were in the age group of 26 to 30 followed by 31 to 35. Anthropometric measurements were represented in Table 2 which shows that male mean height 170.74±7.67, Weight 76.25±15.29 and BMI 26.28±5.62 were more than female mean height 161.08±6.72, weight 65.11±12.39 and BMI 25.22±5.14. Body Mass Index (BMI) classification including underweight, normal and overweight among the respondents is shown in Table 3. It can be observed from the table that the majority of total respondents among both males and females were in overweight and obese BMI group. Higher percentage of males (34.4%) were overweight & obese, while underweight respondents (6.8%) were more among males. It is evident from the table that larger proportion of male respondents were overweight as compared to female respondents. Subjects including both male and female only 27% were having Normal weight. The data regarding nutrient intake in Table 4 revealed that mean value of all nutrient intake except fats were higher among males as compared to females. The mean ± SD nutrient intake including protein, fat, carbohydrate and energy in total respondents were 68.23±32.26, 89.35±39.15, 319.90±159.34, 2362.27±906.47 respectively. The mean ± SD of micro nutrient intake including sodium, potassium, magnesium, calcium, iron, vitaminB12 and vitamin C were 1768.40±1307.17, 2023.65±1052.85, 275.76±116.30, 554.79±540.54, 13.84±7.88, 0.092±0.13, 61.38±41.13 respectively. Figure 1 shows that macro nutrients including protein, carbohydrates and energy were taken more by males while female were taking more fats compared to recommended nutrient per day. Micro nutrients including potassium, magnesium, calcium, iron, vitamin B12 and vitamin C were consumed less as per RDA by both male and female. Sodium intake was more among males than female as per RDA.

Distribution of food consumption pattern among the respondents can be observed from Table 5. This table shows that cereals, legumes and pulses, milk and milk

products, root and tubers, cooking oil and fats are the most common food groups used by the respondents in a daily routine while only 21 % and 24% of total participants daily consumed green leafy vegetables and fruit respectively.

IV. CONCLUSION

This study has been concluded that prevalence of malnutrition including undernutrition and over nutrition was higher among female respondents based upon nutrients intake. The mean Body mass index (BMI) was 26.28±5.62 and 25.22±5.14 in males and females respectively shows male were at more unhealthy eating habits which causes overweight and obesity. Male respondents (11.4%) and females (15.6%) were at low health risk on the basis of their BMI classification falls under Normal category. This analysis might deliver baseline data that can be utilized in subsequent studies regarding young adults in India, assisting in the management and enhancement of young adults nutritional and health well-being.

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