

## International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693  
 ISSN Online: 2617-4707  
 IJABR 2024; 8(8): 1421-1425  
[www.biochemjournal.com](http://www.biochemjournal.com)  
 Received: 02-06-2024  
 Accepted: 08-07-2024

**Archna Yadav**  
 M.Sc. Student, Department of  
 Food Science and Nutrition,  
 College of Community Science  
 Chandra Shekhar Azad  
 University of Agriculture and  
 Technology, Kanpur, Uttar  
 Pradesh, India

**Vinita Singh**  
 Associate Professor,  
 Department of Food Science  
 and Nutrition, College of  
 Community Science  
 Chandra Shekhar Azad  
 University of Agriculture and  
 Technology, Kanpur, Uttar  
 Pradesh, India

**Corresponding Author:**  
**Archna Yadav**  
 M.Sc. Student, Department of  
 Food Science and Nutrition,  
 College of Community Science  
 Chandra Shekhar Azad  
 University of Agriculture and  
 Technology, Kanpur, Uttar  
 Pradesh, India

## Macro nutrients intake of taxi drivers in Kanpur city

**Archna Yadav and Vinita Singh**

**DOI:** <https://doi.org/10.33545/26174693.2024.v8.i8r.2021>

### Abstract

This study examines the macro nutrient intake of taxi drivers in Kanpur city. Data was collected from the 100 taxi drivers, who lived in different area of Kanpur city by using purposive and random sampling. A self- organized questionnaire was used to get the necessary information from the taxi drivers. 24-hours dietary recall method was used to examines nutrients intake and health of taxi drivers. The findings of study on nutrients intake revealed significant deficiencies and some increased as compared to the Recommended Dietary Allowances (RDA). The mean intake of carbohydrate and fat were found to be increased in diet but consumption of energy, protein, were found to be deficient as compared to RDA.

**Keywords:** Deficiencies, macro nutrients, nutrient intake, recommended dietary allowances (RDA) and taxi drivers

### Introduction

Taxi drivers play a crucial role in urban transportation systems, providing on-demand transportation services to passengers in cities worldwide. Taxi drivers are front-line employees in the transportation sector who must navigate through intricate urban environments, adjust to shifting traffic patterns, and guarantee the timely and safe delivery of passengers to their destinations (Smith and Johnson, 2019) <sup>[10]</sup>. The taxi business witnessed considerable changes after independence, with the introduction of radio cabs and the establishment of taxi unions. In the 1980s and 1990s, radio dispatch systems were introduced, allowing passengers to easily book cabs (Jha, 2017) <sup>[5]</sup>.

“A nutritional assessment is a detailed evaluation of a patient's nutritional status, and can help identify if a patient has a nutritional imbalance or is likely to develop a pathological condition due to nutritional imbalance”. Nutritional assessment plays a crucial role in evaluating individuals' dietary intake and nutritional status (Smith and Johnson 2020) <sup>[9]</sup>. Food and nutrition are basic indispensable needs of humans. Nutrition plays a critical role in maintaining the health and well-being of individuals and is also an essential component of the healthcare delivery system. The nutritional status of individuals affects the clinical outcomes. Essential nutrients are classified into six groups, namely carbohydrates, proteins, lipids, minerals, vitamins, and water. Healthy people's nutritional needs vary depending on age, sex, and level of activity. As a result, food intake recommendations differ for every group of people. Dietary Reference Intakes (DRIs), or dietary guidelines for populations across the life cycle, are issued by the Food and dietary Board of the Institutes of Medicine (IOM) under the National Academy of Sciences in the United States (Kesari and Noel, 2023) <sup>[6]</sup>. An imbalance in nutritional intake leads to malnutrition. The word ‘malnutrition’ is defined in multiple ways, and there is still no consensus (Elia, 2017) <sup>[3]</sup>. Traditionally, the term malnutrition has been used in the context of lack of energy intake or deficiencies of nutrients, under which two main conditions, namely marasmus, and kwashiorkor, are discussed. Marasmus primarily refers to energy or calorie deficiency, whereas kwashiorkor refers to protein deficiency characterized by peripheral oedema (Titi-Lartey *et al.*, 2023) <sup>[13]</sup> (Benjamin *et al.*, 2023) <sup>[2]</sup>. An evaluation of the dietary and medical status of cab drivers is essential to understanding how their job affects their overall health. This occupational category may be at higher risk for health issues due to things like insufficient meal plans, sedentary behaviour, and stress from traffic congestion (Srinivasan & Parthiban, 2019) <sup>[11]</sup>. An appropriate energy intake supports optimal body function and assists in changing body composition.

In addition to these, an increase in the proportion of one macronutrient will lead to a decrease in the proportion of the other macronutrients given energy intake. This will in turn affect the intake of micronutrients (Thomas *et al.*, 2016) [12]. During times of high physical activity, energy, macro and micronutrient needs must be met to maintain body weight, replenish glycogen stores, and provide adequate protein to build and repair tissues as well as to avoid low energy availability (Loucks *et al.*, 2011) [7]. Smoking, alcohol consumption and unhealthy diet tend to cluster and are all major modifiable contributors to the burden of chronic disease. Tobacco consumers have a higher consumption of alcoholic beverages and a lower intake of vegetable and fruit (Adepoju *et al.*, 2019) [11]. A collection of several interrelated metabolic risk factors known as metabolic syndrome (MetS) might accelerate the onset of non-communicable diseases (NCDs) like diabetes, abdominal obesity, high blood pressure, low high density lipoprotein cholesterol (HDL-c) and high cholesterol. Two significant risk factors for Metabolic Syndrome include obesity and overweight (Sekgala *et al.*, 2022) [18].

**Materials and Methods**

For the present study, different area of Kanpur Nagar district purposively selected for collecting data. In this study people were selected from different area of Kanpur, who were taxi drivers. The sample size of 100 was taken and sample was selected by purposively sampling method. Data collection involved a self-structured questionnaire administered through personal interviews in the local language. The questionnaire covered general information, nutritional and clinical assessments, dietary history, and lifestyle factors. 24-hour dietary recall and food frequency method were used for collecting detailed information about all food and drinks consumed by taxi drivers. The Nutritive Value of Indian Foods and nutrients requirement for Indians (Recommended Dietary Allowances) by Indian Council of Medical Research (ICMR) is used for nutrients analysis. Health and morbidity were assessed through direct questions about various

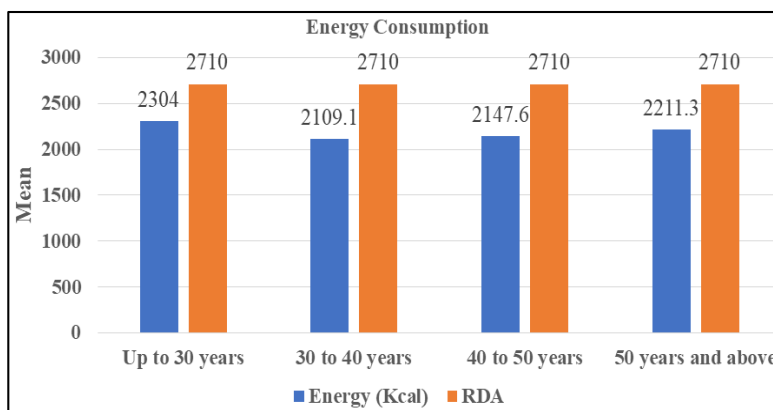
conditions. Data analysis involved percentage calculations, arithmetic and weighted means, standard deviation, and correlation coefficients to interpret the results.

**Results and Discussion**

**Table 1:** Energy consumption of respondents as compared to RDA.

Age group	Energy (kcal)				
	Percent	Mean	S.D.	RDA	Deficit %
Up to 30 years	20.0	2304.0	119.5	2710.0	17.4
30 to 40 years	51.0	2109.1	108.1		
40 to 50 years	25.0	2147.6	130.2		
50 years and above	4.0	2211.3	103.5		
Total	100.0	2237.8	119.5		
Correlation coefficient (r)	0.1990*			p<0.05	

**Table 1:** Table depicts the energy intake by taxi drivers according to age group as compared to the Recommended Dietary Allowance (RDA), Up to 30 years age group 20.0 percent of the respondents have taken energy 2304.0 kcal with standard deviation 119.5 kcal whereas in the age group 30 to 40 years 51.0 percent of respondents have taken energy 2109.1 kcal with standard deviation 108.1 kcal in the research study area of Kanpur City. 25.0 percent of respondents belonged to age group 40 to 50 years have taken average energy 2147.6 kcal with standard deviation 130.2 kcal while only 4.0 percent of the respondents belonged to above 50 years of age group have taken average energy 2211.3 kcal with standard deviation 103.5 kcal in the study area. The average energy have taken by respondents 2237.8 kcal which was found 17.4 percent deficient from RDA. It was observed majority of the taxi drivers were skip breakfast and some drivers were skip lunch due to unbalance working schedule in a day. So most of the respondents were not consuming sufficient amount of cereals, legumes and nuts etc. The observed value of correlation coefficient (0.1990\*) was significant at 5% level of significance.



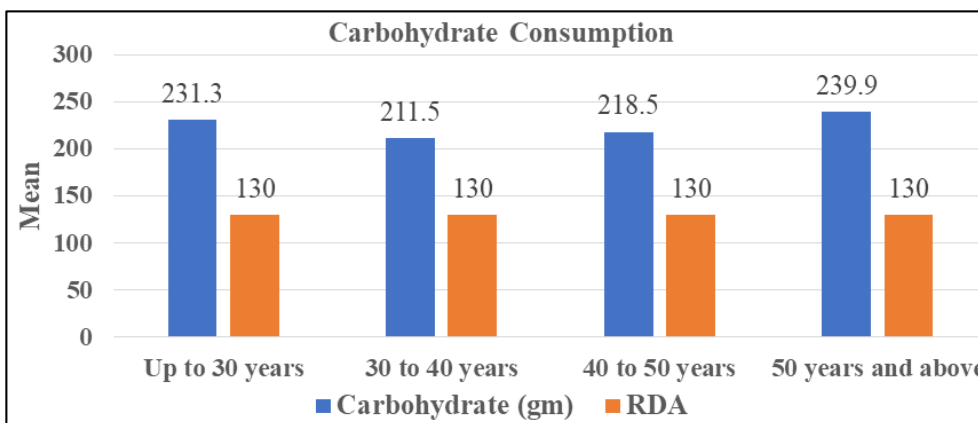
**Fig 1:** Energy consumption of respondents as compared to RDA.

**Table 2:** Carbohydrate consumption of respondents as compared to RDA.

Age group	CHO (gm)				
	Percent	Mean	S.D.	RDA	Deficit %
Up to 30 years	20.0	231.3	52.8	130	+ 67.9
30 to 40 years	51.0	211.5	44.6		
40 to 50 years	25.0	218.5	45.8		
50 years and above	4.0	239.9	55.3		
Total	100.0	218.3	47.1		
Correlation coefficient (r)	0.1055			p>0.05	

**Table 2:** Table reveals the CHO intake by taxi drivers according to age group as compared to the Recommended Dietary Allowance (RDA), Up to 30 years age group 20.0 percent of respondents have taken CHO 231.3 gm with standard deviation 52.8 gm whereas in the age group 30 to 40 years 51.0 percent of respondents have taken average CHO 211.5 gm with standard deviation 44.6 gm in the research study area of Kanpur City. 25.0 percent of respondents belonged to age group 40 to 50 years have taken average CHO 218.5 gm with standard deviation 45.8

gm while only 4.0 percent of the respondents belonged to above 50 years of age group have taken average CHO 239.9 gm with standard deviation 55.3 gm in the study area. The average CHO have taken by respondents 218.3 gm which was found 67.9 percent increased as compared to RDA due to high intake of carbohydrates rich foods (potatoes, rice, noodles, pasta, crackers, jaggery, banana and cereals etc.) in their daily diet. The observe value of correlation coefficient (0.1055) was found to be significant at 5 percent level of significance.



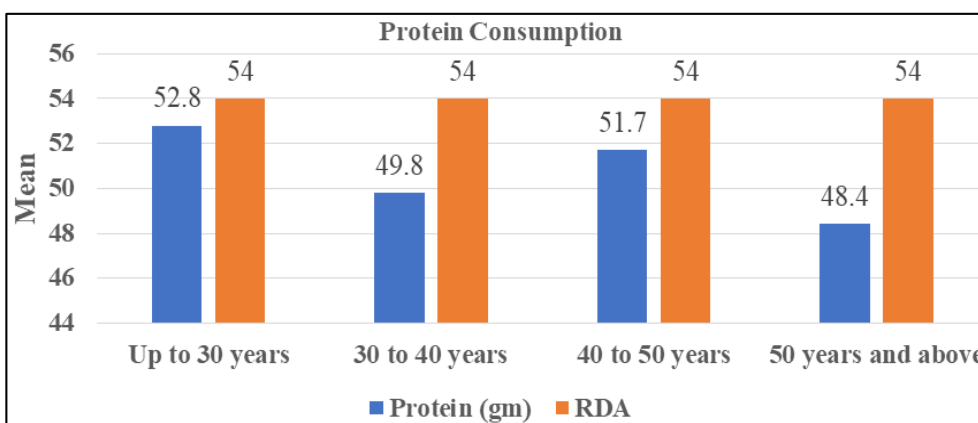
**Fig 2:** Carbohydrate consumption of respondents as compared to RDA.

**Table 3:** Protein consumption of respondents as compared to RDA.

Age group	Protein (gm)				
	Percent	Mean	S.D.	RDA	Deficit percent
Up to 30 years	20.0	52.8	4.1	54.0	5.9
30 to 40 years	51.0	49.8	5.4		
40 to 50 years	25.0	51.7	5.9		
50 years and above	4.0	48.4	8.8		
Total	100.0	50.8	5.5		
Correlation coefficient (r)	-0.1083			<i>p</i> >0.05	

**Table 3:** Shows the protein intake by taxi driver as per age group as compared to the Recommended Dietary Allowance (RDA), 20.0 percent of taxi drivers were found up to 30 years of age group have taken average protein 52.8 gm with standard deviation 4.1 gm while 51.0 percent of taxi drivers were found in 30 to 40 years of age group and have taken average protein 49.8 gm with standard deviation 5.4 gm in the study area of Kanpur City. In the age group 40 to 50 years 25.0 percent of respondents have taken average protein 51.7 gm with standard deviation 5.9 gm while only 4.0 percent of taxi drivers belonged to above 50 years age

group and have taken average protein 48.4 gm with standard deviation 8.8 gm in the study area of Kanpur City. Total average protein have taken by respondents 50.8 gm which was found 5.9 percent deficit as compared to RDA with standard deviation 5.5 gm. It was observed majority of respondents were not consuming sufficient quantity of legumes, egg, fish, poultry, milk and milk products etc. which is high in protein. The observed value of correlation coefficient (-0.1083) was found to be significant at 5 percent level of significance.



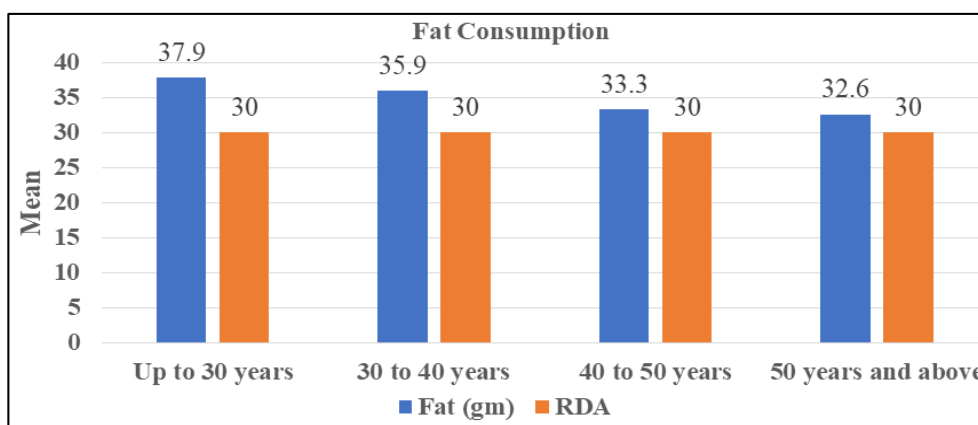
**Fig 3:** Protein consumption of respondents as compared to RDA.

**Table 4:** Fat consumption of respondents as compared to RDA.

Age group	Fat				
	Percent	Mean	S.D.	RDA	Deficit %
Up to 30 years	20.0	37.9	5.6	30	+18.3
30 to 40 years	51.0	35.9	5.2		
40 to 50 years	25.0	33.3	6.2		
50 years and above	4.0	32.6	5.2		
Total	100.0	35.5	5.7		
Correlation coefficient (r)	0.2762*			$p < 0.05$	

**Table 4:** The table indicates the fat Intake by taxi drivers as per age group as compared to the Recommended Dietary Allowance (RDA), 20.0 percent of taxi drivers were found up to 30 years of age group have taken average fat 37.9 gm with standard deviation 5.6 gm while 51.0 percent of taxi drivers were found in 30 to 40 years of age group and have taken average fat 35.9 gm with standard deviation 5.2 gm in the study area of Kanpur City. Taxi drivers belonged to the age group 40 to 50 years 25.0 percent have taken average fat 33.3 gm with standard deviation 6.2 gm where only 4.0

percent of taxi drivers belonged to above 50 years age group have taken average fat 32.6 gm with standard deviation 5.2 gm in the study area of Kanpur City. Total average fat have taken by respondents 35.5 gm which was found to be 18.3 percent increased from RDA with standard deviation 5.7 gm. Taxi drivers were consuming junk food, fried and oily food and processed food during their work. The observed value of correlation coefficient (0.2762\*) was found to be significant at 5 percent level of significance.

**Fig 4:** Fat consumption of respondents as compared to RDA.

### Conclusion

In conclusion, reveals the dietary intake of taxi drivers varies significantly across age groups. Younger drivers (up to 30 years) have taken higher amounts of energy, carbohydrates, and fats compared to older age groups, while their protein intake is relatively lower. Overall, respondents average energy intake was found to be 17.4% and protein intake was 5.9% deficient as compared to the recommended dietary allowance (RDA), while their carbohydrate and fat intakes were found to be higher than the recommended dietary allowance (RDA). This imbalance is attributed to irregular eating patterns, such as skipping meals and a diet high in carbohydrates and fats due to high consumption of fast food and beverages but low in protein-rich foods such as legumes and dairy products in their diet. The observed correlations indicate significant relationships between energy, carbohydrates, fats, and dietary deficiencies, emphasizing the need for improved dietary habits among taxi drivers to address these nutritional inadequacies.

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