

# **E-report on a Nutritional Dietary Dataset**

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# Introduction

This report presents an analysis of health and nutrition-related variables collected from 1,000 individuals. The dataset includes information on body composition (BMI, body fat, and muscle mass), dietary intake (macronutrients and micronutrients), physical activity, and hydration. The objective is to assess nutritional balance, fitness levels, and identify meaningful relationships between dietary and physiological indicators. All statistical analysis was conducted using R.

## Methods

Descriptive statistics (mean, median, standard deviation, and range) were used to summarize the distribution of health metrics and dietary variables. The population's nutritional habits, physical activity levels, and body composition patterns were evaluated accordingly.

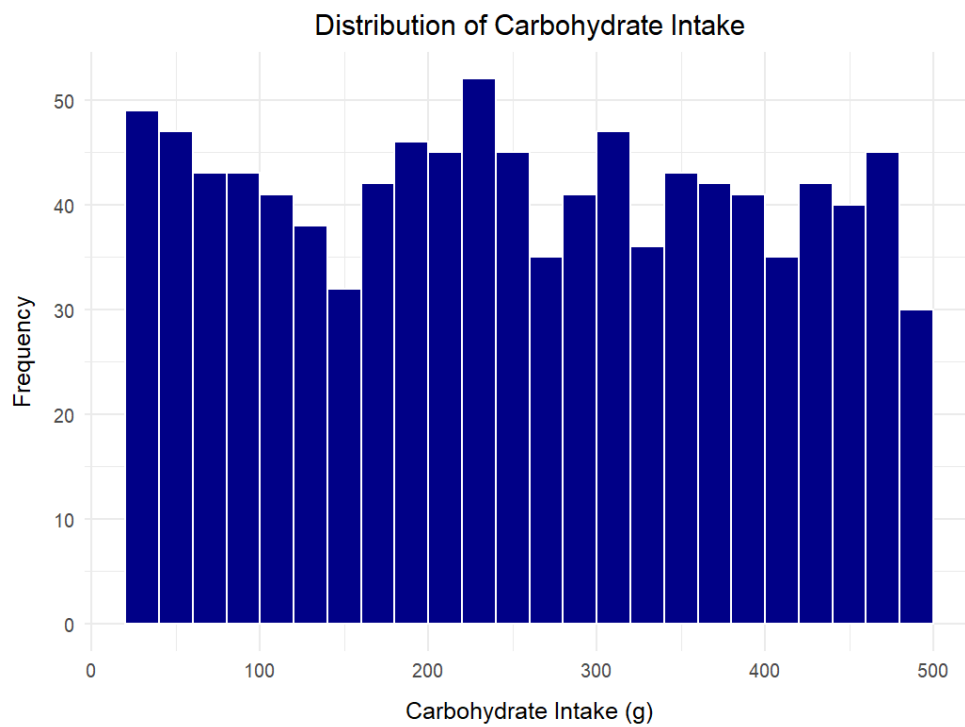
To further explore relationships between variables, Pearson's correlation test was used. This statistical method assesses the strength and direction of the linear relationship between continuous variables. Key associations tested include physical activity vs body fat, and caloric intake vs BMI.

## Key Results and Figures

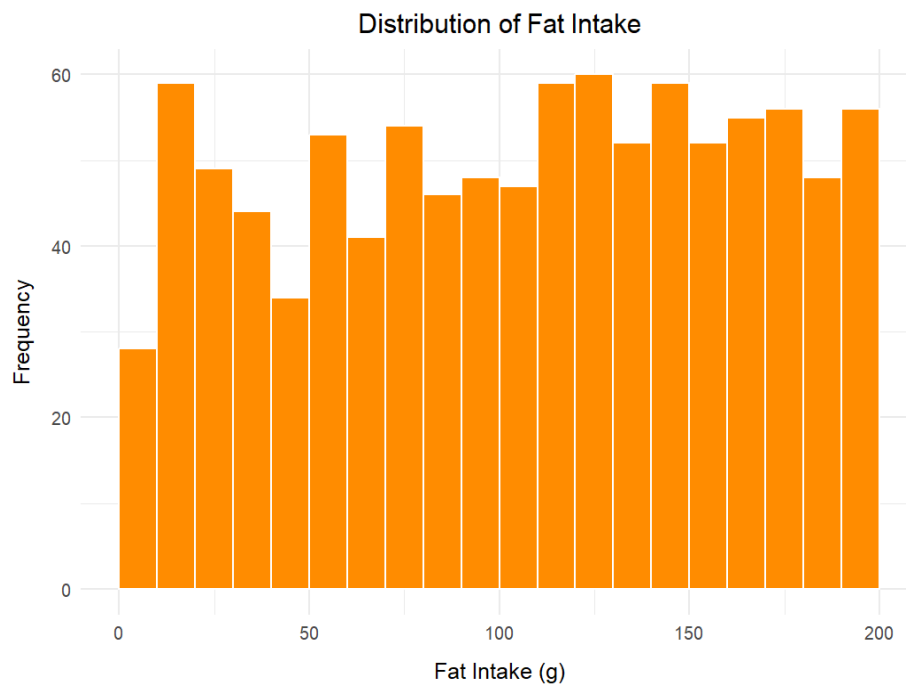
### Descriptive Findings

Health Domain	Observation	Insight
Body Composition	Body Fat %: Mean = 35.8%, SD = 14.1	Wide variability suggests a mix of fit and at-risk individuals.
	Muscle Mass: Mean = 39.9 kg, min = 3.08 kg	Extremely low values may signal sarcopenia or undernutrition.
	BMI: Mean = 22.98 (normal), SD = 2.80	Most individuals fall within the healthy weight range.

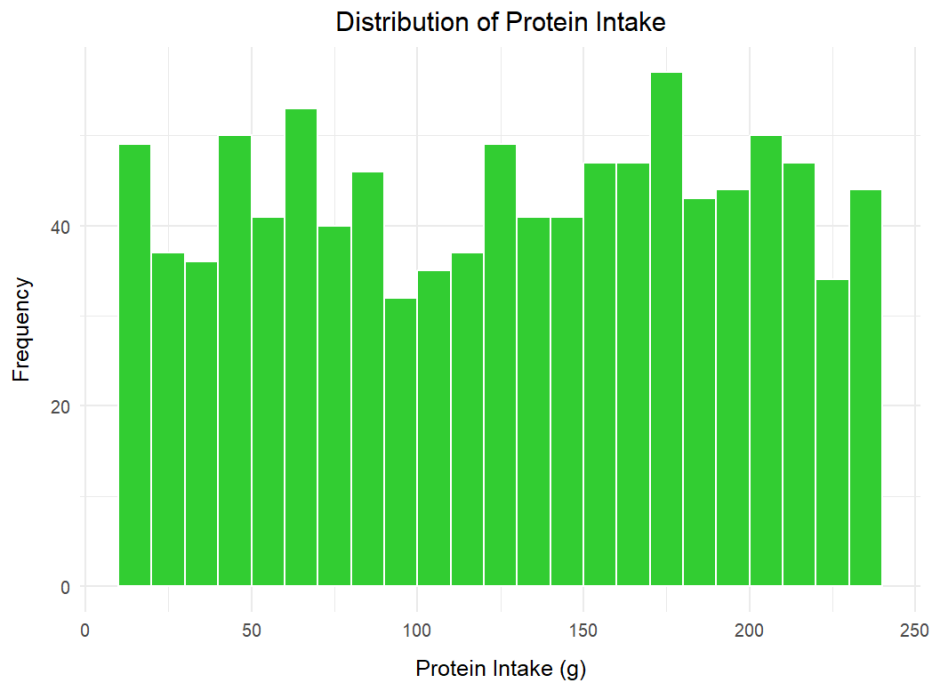
Physical Activity	Mean = 8.03 hrs/week, SD = 4.92	Most meet exercise guidelines, though some are fully sedentary.
Macronutrients	Calories: Mean = 2476 kcal/day, SD = 800	Very wide range — may reflect inconsistent diet quality.
	Protein: Mean = 126.7g/day, min = 11g	Despite high average, some are at risk of protein deficiency.
	Fat: Mean = 105.6g/day	Suggests fat-heavy diets; type of fat not distinguished.
	Carbohydrates: Mean = 254.6g/day	Falls within typical dietary recommendations.
Micronutrients	Vitamin C: Mean = 745.6 mg/day, max = 2000 mg	Likely reflects supplementation or high fruit intake.
	Iron: Mean = 17.8 mg/day, range = 5–40 mg	Generally meets daily requirements.
Hydration	Mean Water Intake = 2491 ml/day, median = 2000 ml	Most individuals meet recommended intake levels.



**Figure 1.** Distribution of carbohydrate intake across patients



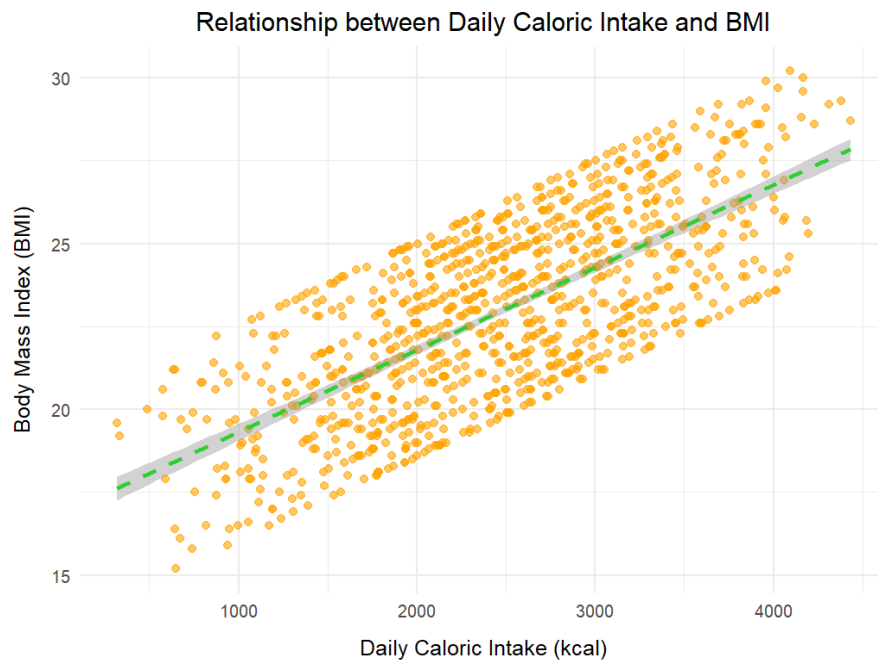
**Figure 2.** Distribution of fat intake across patients



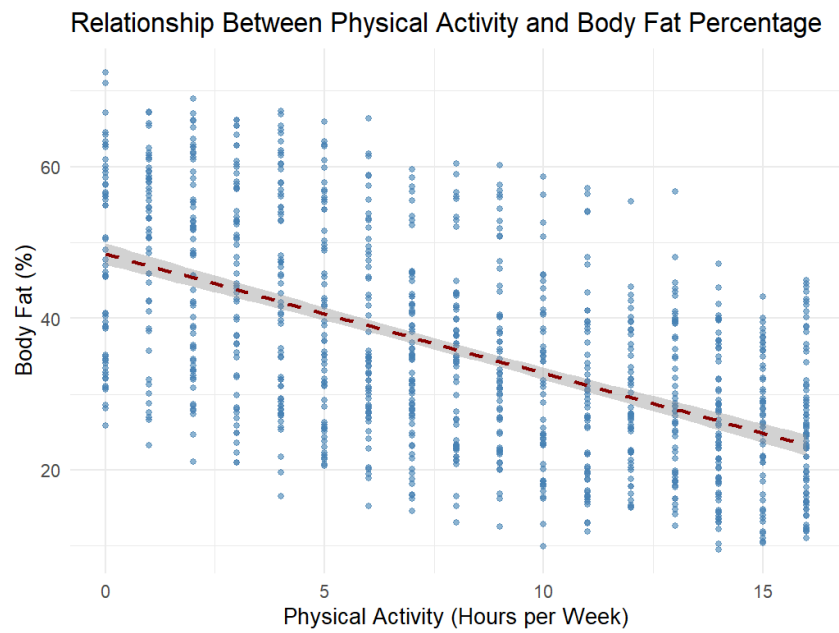
**Figure 3.** Distribution of protein intake across patients

#### Advanced Statistical Analysis: Pearson Correlation

Variable Pair	Correlation Coefficient	p-value	Strength & Direction	Interpretation
Physical Activity vs Body Fat %	-0.550	< 2.2e-16	Moderate negative	As physical activity increases, body fat tends to decrease — aligns with fitness research. This is reflected in Figure 5.
Caloric Intake vs BMI	0.711	< 2.2e-16	Strong positive	Higher calorie intake is strongly associated with higher BMI, confirming energy balance theory. This is reflected in Figure 4.



**Figure 4.** Scatterplot of BMI by daily caloric intake with trendline



**Figure 5.** Scatterplot of body fat percent by physical activity with trendline

## Interpretation and Conclusion

The dataset presents a largely health-conscious population with average BMI values in the normal range and acceptable hydration levels. However, wide variability in caloric and macronutrient intake, along with some extreme values in muscle mass and body fat, suggest the presence of both health-optimized and nutritionally at-risk individuals.

The correlation findings reinforce well-established links in health science: more physical activity is linked to lower body fat, while higher calorie consumption is associated with higher BMI. These results confirm the importance of lifestyle management and balanced diet in maintaining healthy body composition.

Future analyses could explore fat quality (saturated vs. unsaturated), supplement use, and the role of dietary patterns across age groups or socioeconomic classes to better understand health disparities.