

GITHUB PORTFOLIO

# Nutritional Dietary Data

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E-REPORT

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# DIETARY DATA

## E REPORT

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**BI120L**

## INTRODUCTION

Nutrition and Physical activity are both widely recognized as a definition of one's individual health status, body composition, energy metabolism, and long-term disease risk. Correlations between macronutrient intake (i.e., proteins, fats, carbohydrate) and body composition metrics such as muscle mass, body fat percentage, and Body Mass Index (BMI); physical activity is known to play a significant role in modulating lean tissue growth and fat loss, and its interaction with dietary intake may lead to a positive insight.

## METHODS USED FOR ANALYSIS

### Data Cleaning:

- Removed columns with >80% missing data.
- Excluded rows with missing values in critical variables: body fat %, muscle mass, BMI, PA hours, caloric intake.

### Variable Handling:

- Standardized column names.
- Converted categorical variables to factors.
- Quintile grouping applied to PA hours and macronutrient intake for subgroup analysis.

Diagnostics: Outlier detection and normality checks done visually/statistically for all quantitative variables.

# RESULTS & FIGURES

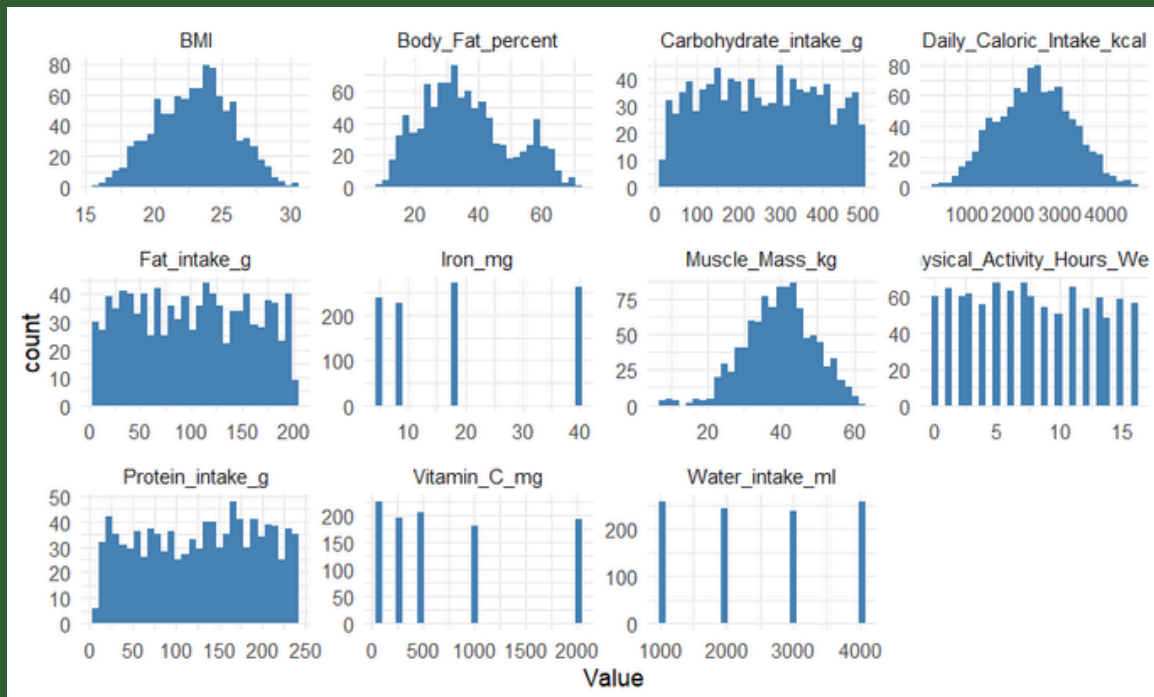


Figure 1 – Histograms:

- Most variables (BMI, body fat %, PA, intake) showed right-skewed distributions.
- Suggests most participants fall within moderate ranges; a few show extreme lifestyle patterns.

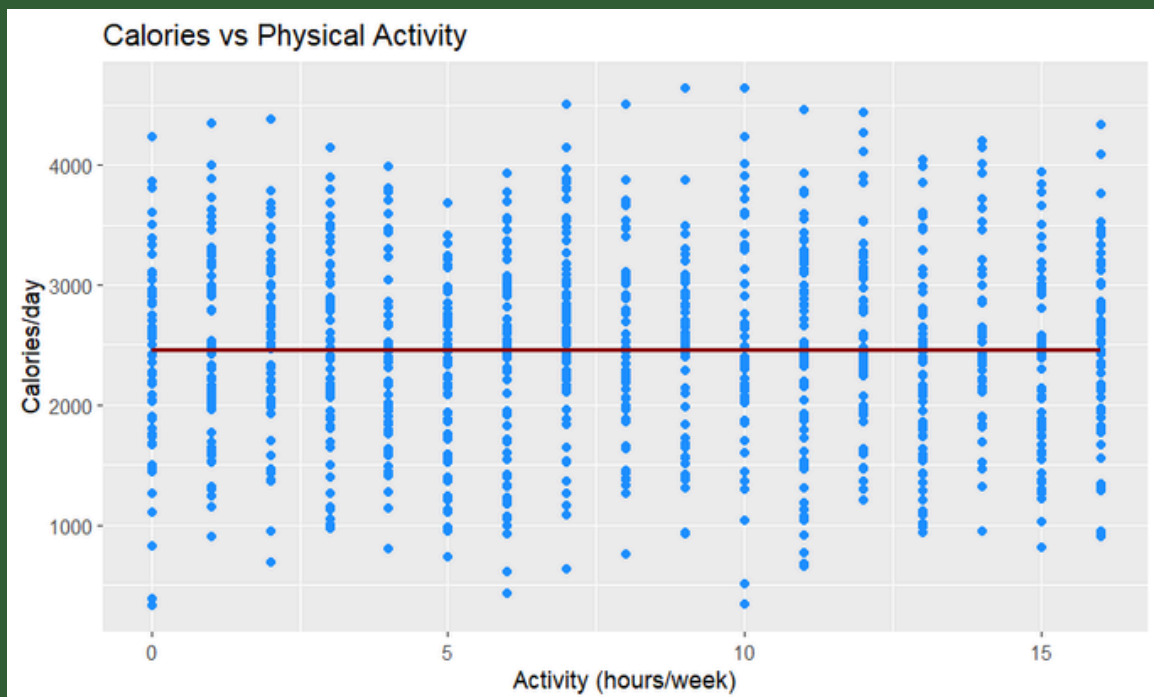


Figure 2 – Scatterplot (Physical Activity vs. Calories Burned):

- Despite large variation in PA hours, daily calorie burn remains ~2500 kcal on average.
- Implies calorie expenditure is not strongly dependent on exercise volume.

# RESULTS & FIGURES

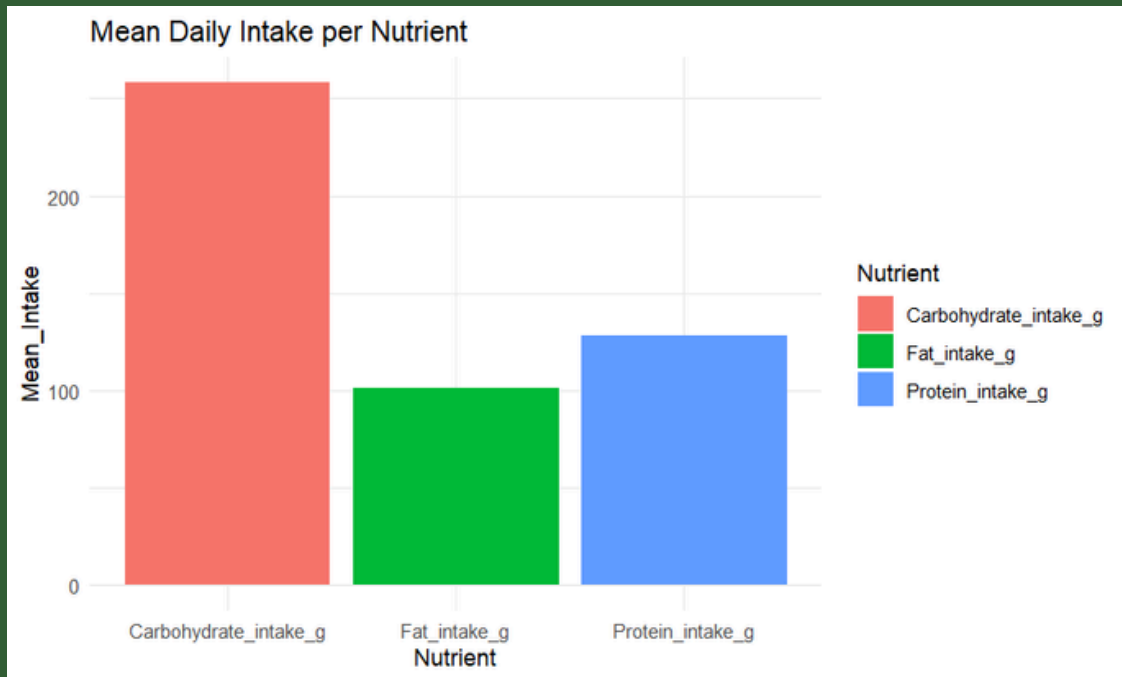


Figure 3 – Bar Chart (Macronutrient Intake):

- Carbohydrates had the highest average intake, followed by protein, then fat.
- Reflects a carb-heavy dietary pattern across weight groups.

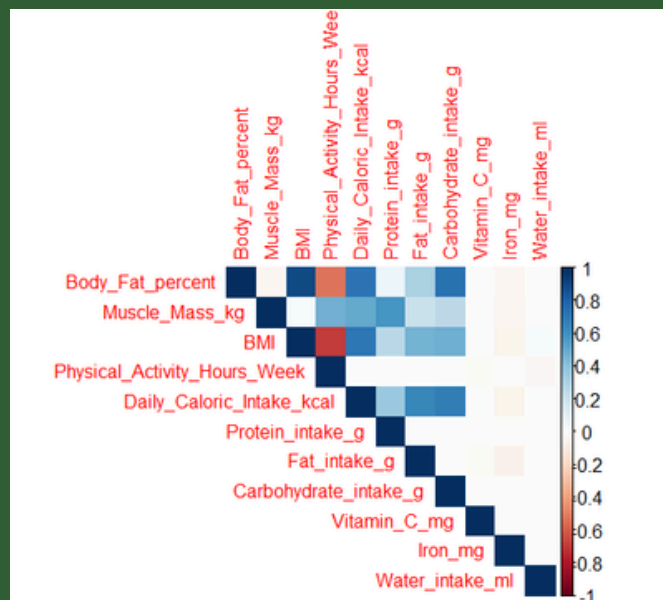


Figure 4 – Correlation Overview:

- BMI ↔ Body Fat %: Strong positive correlation.
- Muscle Mass ↔ Body Fat %: Negative correlation.
- Physical Activity ↔ Muscle Mass: Weak but positive correlation.
- BMI ↔ Protein/Calorie Intake: Slight positive trends.
- Micronutrients (Water, Iron, Vitamin C): Weak, scattered relationships → vary individually.

# INTERPRETATION AND BRIEF CONCLUSION

## General Patterns:

- Health and nutrition variables cluster around moderate values with right-skewed distributions.
- Macronutrient intake, especially carbs, shows greater variability.

## Unexpected Insight:

- Physical activity doesn't predict calorie burn well → may be more influenced by metabolism or body composition than PA volume.

## Body Composition Trends:

- Higher muscle mass linked to lower body fat.
- Higher BMI and protein intake tend to co-occur.

## Micronutrients:

- Act independently, not strongly correlated with body composition or PA.
- Recommendations:
- Calorie burn modeling should consider metabolic and biological factors, not just exercise volume.
- Personalized interventions should focus on combined influences of diet and behavior, rather than isolated metrics.
- Potential for deeper research using non-linear models or multifactorial analysis.