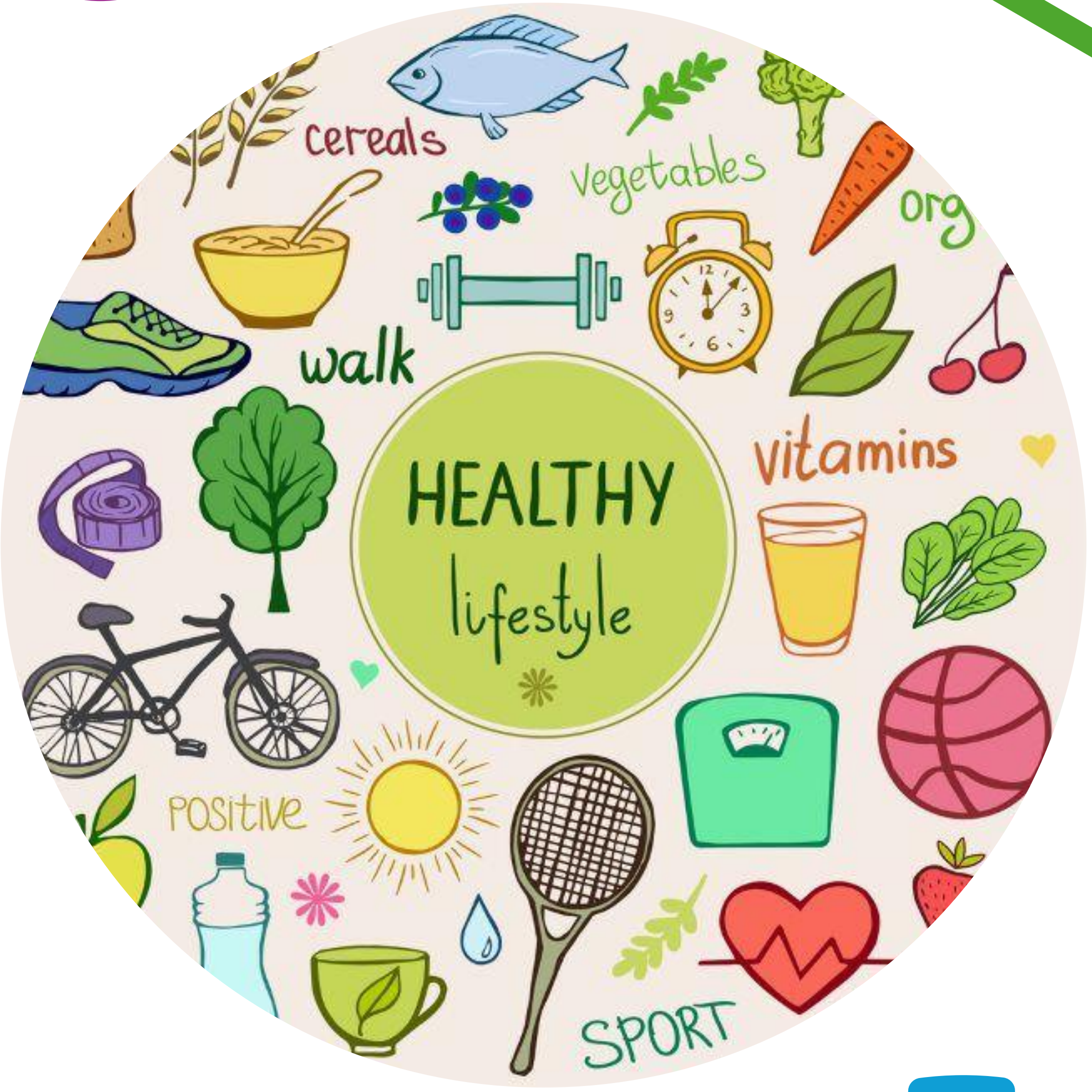


STATISTICAL ANALYSIS ON HEALTH AND NUTRITIONAL AWARENESS

INTRODUCTION

Lifestyle-related health issues are rising due to a gap between nutritional knowledge and actual dietary practices. This project investigates that disconnect by analyzing real-world data on diet, physical activity, and sleep. We move beyond theory to examine self-reported data from diverse respondents. Our goal is to quantify the relationships between these lifestyle factors and health indicators like BMI. We aim to translate these findings into action by understanding and addressing the critical diet knowledge gap.

METHODOLOGY

1. Research Design
- Cross-sectional survey using a structured online questionnaire.

2. Data Source
- Primary data collected from 296 respondents via Google Forms.

3. Tools & Technologies
- Python with Pandas, NumPy, and Matplotlib for analysis and visualization.
- R for advanced statistical testing (ANOVA, Chi-square).

4. Analytical ApproachExploratory Analysis:
- BMI calculation and health behaviour profiling.

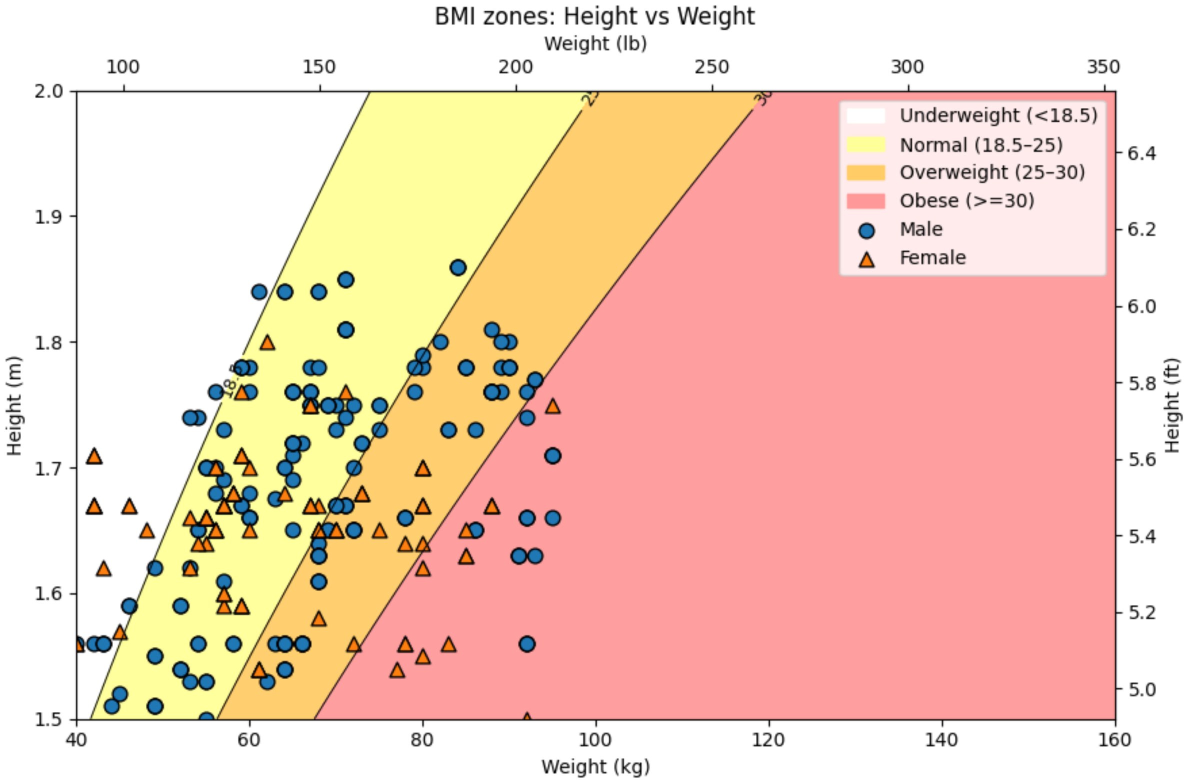
Advanced Analytics:
- Regression models to predict BMI from macronutrients and demographics.
- Hypothesis testing (ANOVA, Chi-square) to compare groups.
- Correlation analysis (Spearman) for sleep, stress, and fatigue.

5. Data Processing
- Data cleaning and encoding of categorical variables for quantitative analysis.

OBJECTIVES

- To calculate Body Mass Index (BMI) for each respondent and classify them into standard fitness categories (Underweight, Normal weight, Overweight, Obese).
- To compare health behaviors, including diet and supplement usage, across different genders and levels of physical activity.
- To assess the general awareness and practice of a balanced diet among the respondents.
- To examine the relationships between sleep duration and stress levels, and to assess how these lifestyle factors are associated with self-reported health issues such as fatigue.
- To analyze nutrition patterns (consumption of protein, carbohydrates, fats) across different age groups.

BMI Classification



Underweight	>18.5	**28**
Normal	18.5-25	**148**
Overweight	25-30	**87**
Obese	>=30	**33**
Total		**296**

Well-being Factors

SLEEP

Fatigue

- Spearman's ρ = -0.36
- $\chi^2 = 39.54$
- Shorter sleep → more fatigue

Stress

- Spearman's ρ = -0.57
- $\chi^2 = 17.98$
- Longer sleep → lower stress

Descriptive Statistics on Awareness of Balanced Diet and Nutrition

SUMMARY STATISTICS			
Awareness Variable	High Awareness (%)	Moderate (%)	Low/No Awareness (%)
Calorie Requirements	33.4459%	32.0946%	34.4595%
Nutrition Labels	37.5000%	34.1216%	28.3784%
Sugar Alternatives	48.6486%	0	51.3514%

Nutrition Knowledge

Education × Calorie Awareness

$\chi^2 = 50.14$

Interpretation: Educational level strongly relates to calorie awareness; those with undergraduate and postgraduate education have higher awareness rates, whereas less educated participants show significantly less knowledge.

Education × Nutrition Label Reading

$\chi^2 = 66.17$

Interpretation: Nutrition label literacy varies significantly with education; higher education correlates with more frequent label reading.

Occupation × Nutrition Labels

$\chi^2 = 40.07$
Interpretation: Students and self-employed have higher nutrition label reading rate.

Occupation × Calorie Awareness

$\chi^2 = 34.21$
Interpretation: Calorie awareness varies by occupation, with students and self-employed showing higher awareness.

Nutrient Intake by Age Group

Protein Intake:

- F = 6.20, F critical → 2.245
- Significant difference across age groups
- Highest in 18–24 age group (69.46g),

  lowest in 55+ (50.38g)

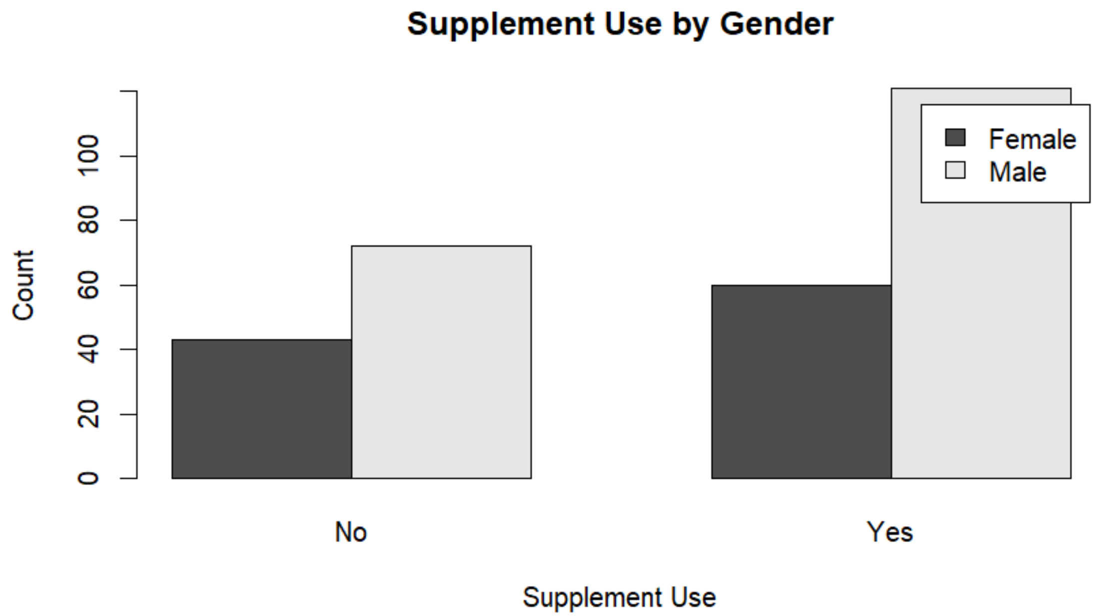
Carbohydrate Intake:

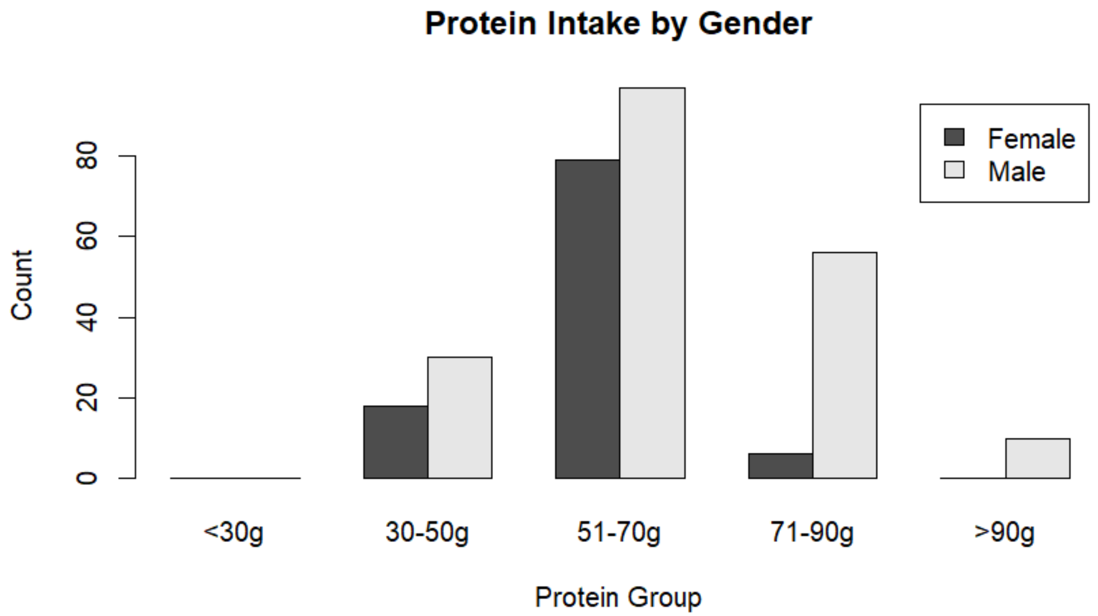
- F = 3.80, F critical → 2.245
- Significant difference across age groups

Fat Intake:

- F = 4.00, F critical → 2.245
- Significant difference across age groups

Fitness Behaviour Profile





Interpretation: Males are more likely to use dietary supplements in this sample.

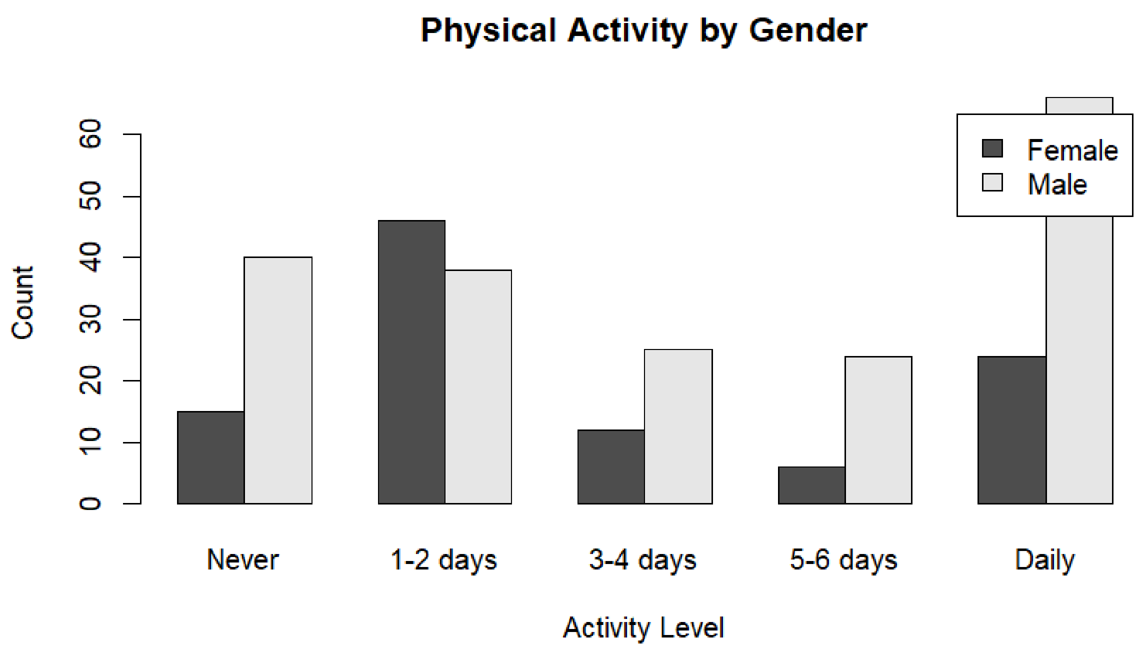
$\chi^2 = 0.39$

→ No significant difference

Interpretation: Males in this dataset demonstrate a notably higher frequency of physical activity.

$\chi^2 = 98.73$

→ Strong association between activity and supplement use



Interpretation: Males in this dataset consistently consume more protein than females, which may reflect differences in dietary habits, body mass, or nutritional goals.

$\chi^2 = 21.74$

→ Males more active than females

Regression Analysis: BMI v/s Macronutrients

Model 1: Basic Macronutrient Effects

BMI = 10.402 + 0.069(Protein) - 0.011(Carbs) + 0.235(Fats)

- Interpretation**:** R^2 = 17.4% indicates very limited predictive power – macronutrients alone do not explain BMI well. This is an additive model. It assumes the effect of each macronutrient is independent.

Model 2: Macronutrient Interactions

BMI = -69.08 + 0.756(Protein) + 0.386(Carbs) + 1.594(Fats) - 0.0036(Protein×Carbs) - 0.0106(Protein×Fats) - 0.0068(Carbs×Fats) + 0.00006(Protein×Carbs×Fats)

- Interpretation**:** R^2 = 28.3%: Better than simple macronutrient model, but still modest explanatory power. This is an interaction model. The effect of one nutrient depends on the levels of the others.

CONCLUSION

Through this project, we successfully measured the real-world gap between health knowledge and daily practice in our community. We moved beyond theory to show how lifestyle choices, like sleep, activity, and diet, directly affect well-being.

We found that society does not share uniform health behaviours. Major differences exist based on gender, education, and age. This shows that public health messages cannot be one-size-fits-all.

Ultimately, we learned that true health is a complex mix of factors. Sleep is as vital as nutrition, and education helps people make choices. Our analysis offers a data-driven base for creating more effective, personalized, and caring health awareness strategies.

THE BOTTOM LINE

"Health involves more than just your diet. It also includes how you sleep, move, and recognize your body's specific needs. Connecting knowledge to action needs personalized, well-rounded approaches."

THANK YOU