Lifestyle Habits and Weight Loss

A Personal Data Tracking Study

Ivan T. Calangan

COM223

Research Overview

Objective

Identify which lifestyle habits most influence weekly weight loss

Variables Tracked

Calorie intake, steps, sleep duration, water consumption, weekly weight

Duration

78 daily measurements, 11 weekly weigh-ins

Outcome

1.2 kg total weight loss (98.0 → 96.8 kg)

Methodology

Data Collection

Daily Variables:
- Calories: Lose It! app
- Steps: Health app + Strava
- Sleep: Manual logging
- Water: Excel tracking

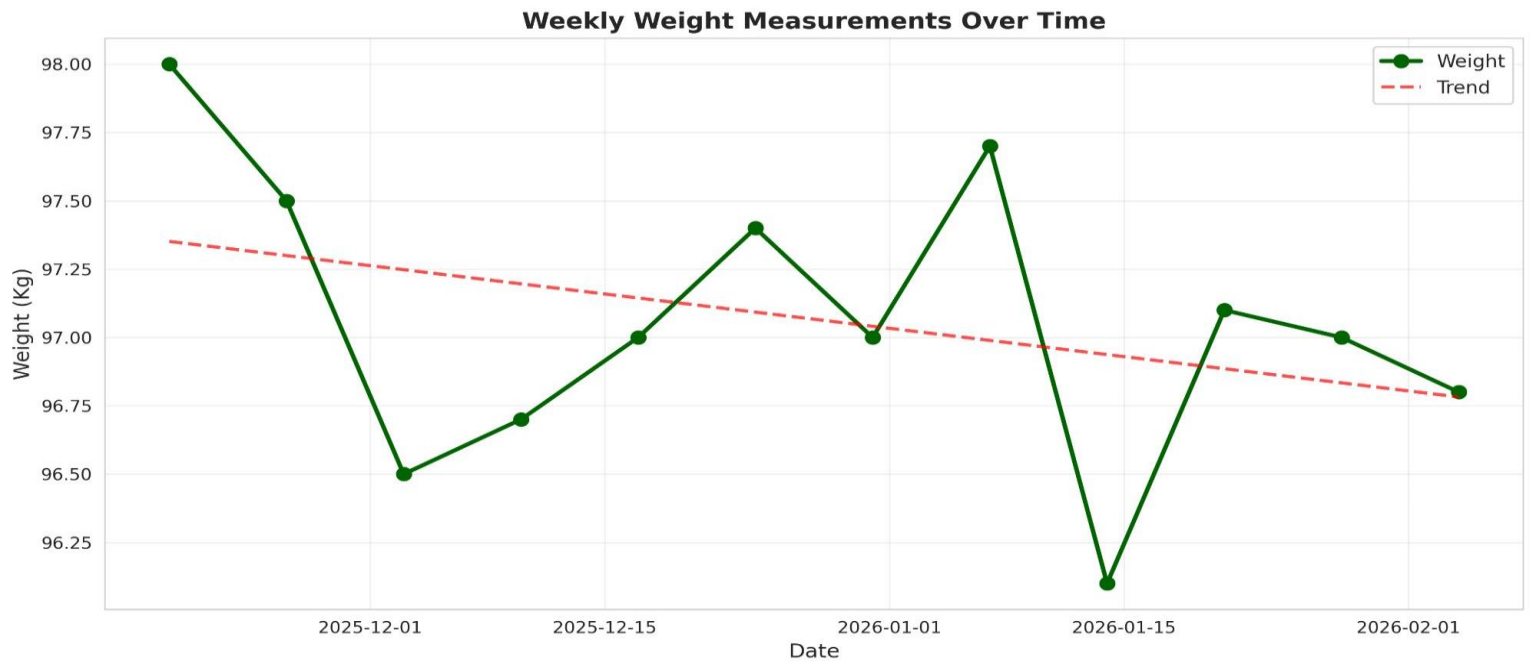
Weekly Measurements:
- Body weight (Wednesday AM)

Analysis Methods

Statistical Tests:
- Pearson correlation analysis
- Independent t-tests
- Cohen's d effect sizes

Tools:
- Python (pandas, scipy)
- Google Colab
- Matplotlib/Seaborn

Weight Loss Progression

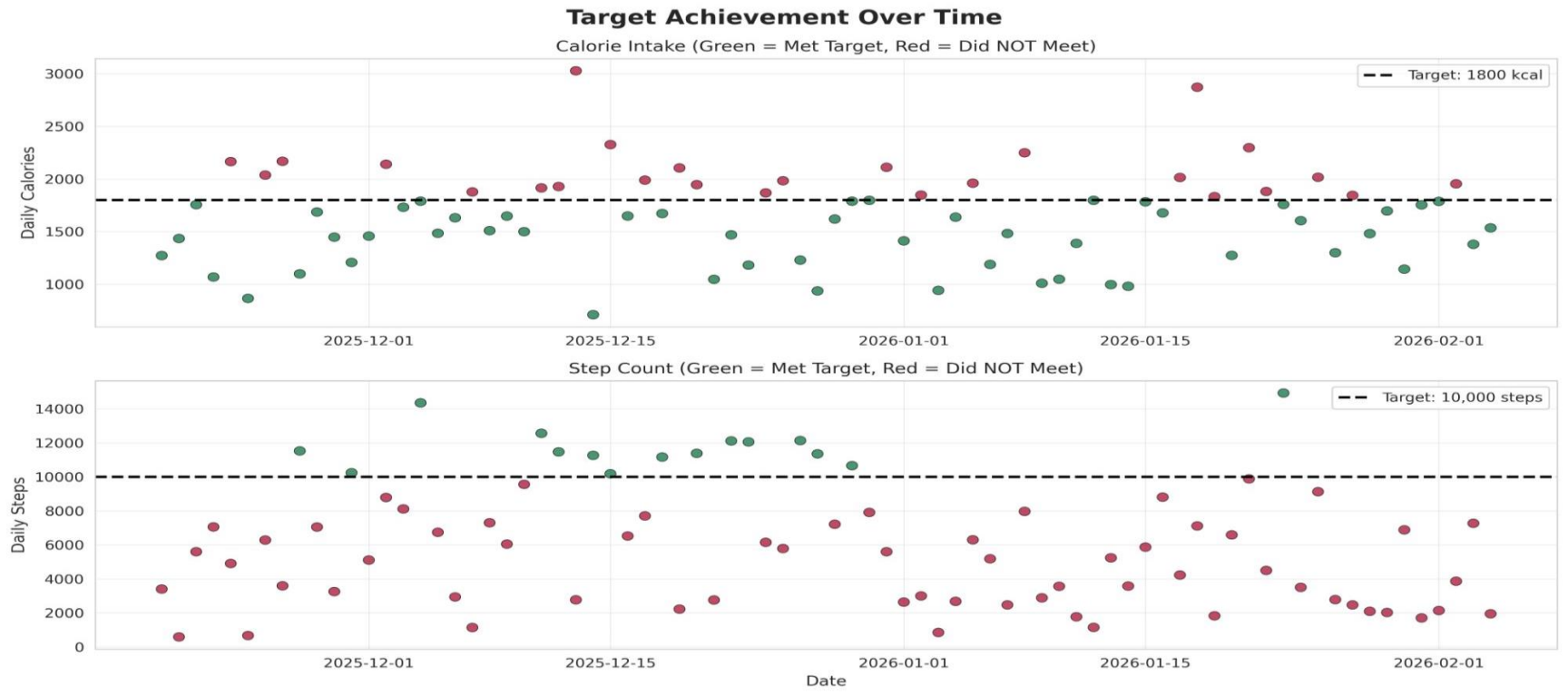


Total Loss: -1.2 kg

Rate: -0.11 kg/week

Weeks: 11

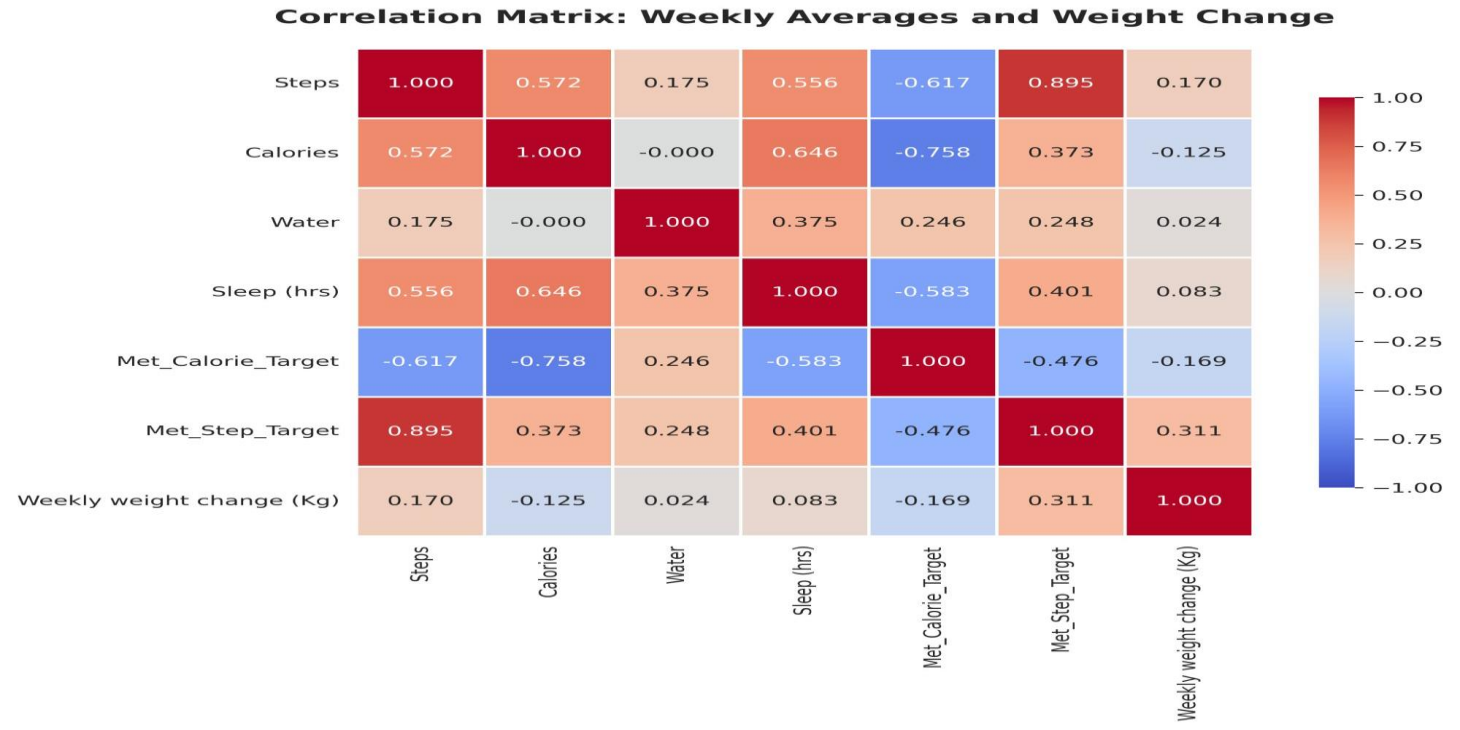
Target Achievement Over Time



🍽️ **Calorie Target: 66.7% (52/78 days)**

👟 **Step Target: 19.2% (15/78 days)**

Correlation Analysis



All correlations with weight change are WEAK (|r| < 0.2) → No single dominant factor

Hypothesis Testing Results

H_1: Calorie Intake Effect

H_1: My target calorie intake has no significant on weekly weight change

Met target (≤1800): -0.33 kg average
Not met (>1800): +0.16 kg average
Difference: 0.49 kg per week |
T statistic = -1.09 p = 0.303 (not significant) | Cohen's d = -0.66 (medium effect)

H_2: Physical Activity Effect

H_2: Reaching my target step count has no significant relationship with weekly weight change

Original (10k target): Cannot test - insufficient achievement (19.2%)
Alternative (median split):
High activity (≥6,500): +0.07 kg Low activity (<6,500): -0.32 kg
T statistic = 0.84 p = 0.425 (not significant) (fail to reject null hypothesis)

Key Insights

1

Weight Loss is Multifactorial

No single behavior dominates. All correlations are weak. Success requires sustained effort across multiple lifestyle domains.

2

Calorie Control Shows Promise

Medium effect size (d=-0.66) despite non-significance suggests practical importance.

3

Realistic Goals Matter

10k steps unrealistic (19.2% achievement). Personalized, baseline-adjusted targets essential.

4

Small Sample Size Limits Statistical Power

Only 11 weeks = 30% power. Need 45-50 weeks for adequate detection.

5

Self-Monitoring is Intervention

Systematic tracking itself influences behavior and supports weight loss outcomes.

Practical Applications

Use Data-Driven Decisions

Personal tracking reveals individual patterns

Consistency Over Perfection

Sustained effort beats perfect adherence

Set Personalized Goals

Base targets on YOUR baseline, not population norms

Add Variables

Track alcohol, smoking, stress level. etc.

Monitor Trends Not Fluctuations

Focus on multi-week patterns

Expect Nonlinear Progress

Fluctuations are normal

Conclusion

Systematic self-monitoring can support weight loss outcomes *even without strong statistical predictors.*

Weight loss is a **multifactorial process** influenced by numerous interacting variables. Short-term fluctuations obscure underlying trends.

Most important insight: Self-monitoring serves as an *intervention itself*, creating awareness and accountability that facilitate progress.

Future work: Extend to 6-12 months • Adjust targets • Track other vices