

Comparison of High vs. Low Fat Diet Influence on VO_{2MAX} in Adolescent Elite Female Soccer Players

Abstract

Aerobic fitness relies on ample storage of all macronutrients that come from one's diet. Dietary recommendations were introduced in the United States in 1977, which have been disputed as to whether a low- or high-fat diet is better for performance. For female athletes, more uncertainty is present due to the lack of research on this population's dietary guidelines. There is a need for further research comparing high- and low-fat diet influence on the aerobic capacity of adolescent female athletes. This study recruited 30 elite female soccer players, ages 16-18 from Charlotte, NC, who were randomly assigned to either a low- or high-fat diet for 12 months. Each athlete completed the Bruce Treadmill VO_{2MAX} Test before and after the 12 months to observe the changes in their aerobic capacity. The results were analyzed and compared to determine a correlation between high or low-fat diet and VO_{2MAX} .

PURPOSE: To compare the effect of high- and low-fat diet on VO_{2MAX} in adolescent elite female soccer players.

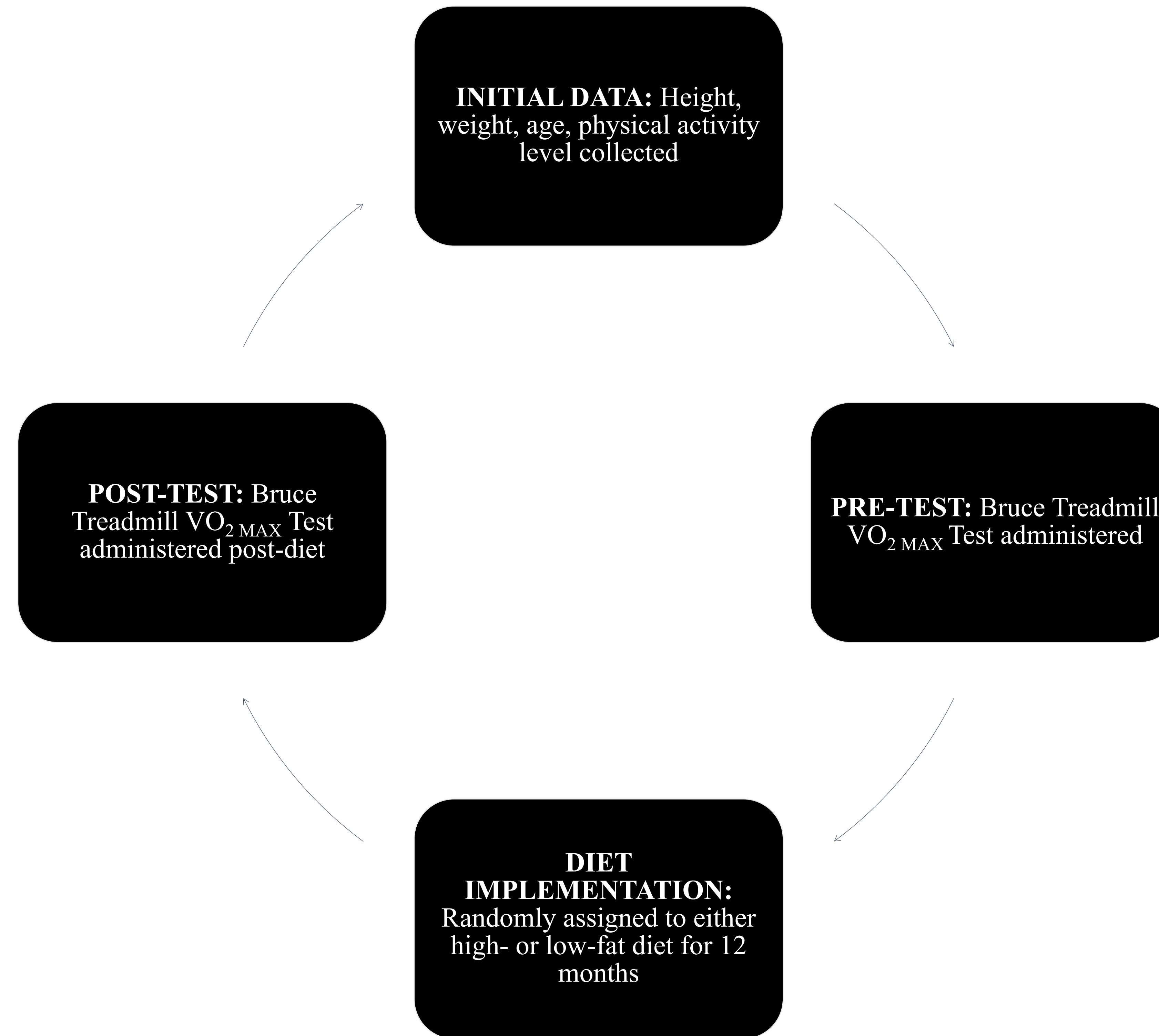
Introduction

- Dietary guidelines introduced to the United States in 1977
- Low-fat recommended to prevent heart disease
- Dietary fat consumption decreased, yet heart disease continued to increase
- Lack of evidence for pro-low fat concerning adolescent female athlete population
- Which is better: low- or high-fat?
- Independent variable: Diet: High-fat (55% of kcals) and low-fat (23% of kcals)
- Dependent variable: VO_{2MAX} in ml/kg/min
- **HYPOTHESIS:** High-fat diet individuals would have a higher VO_{2MAX} than individuals on low-fat diet

Review of Literature

- Jagim et al. (2019) & Gibson et al. (2011) found that adolescent female athletes were chronically malnourished, suggested it was due to lack of nutritional guideline knowledge
- Leddy et al. (1997) found dietary fat to have no adverse effects on those who lead healthy lifestyles (e.g., athletes)
- Bazzano et al. (2014) found low-fat diets to cause more harm than good (lower triglyceride levels, more fat mass)
- Harcombe et al. (2016) found the 1977 dietary guidelines to be based on faulty evidence

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Methods

Participants: 30 elite female soccer players, age 16-18, from Charlotte, NC
 Research design: True-experiment, qualitative
 Data analysis: Pearson Product Moment Correlation to determine the relationship between low/high-fat diet & VO_{2MAX} in ml/kg/min
 Independent Groups T-test to determine group differences between the high and low-fat diets' influence on VO_{2MAX} in ml/kg/min
 Alpha level: $p < .05$

Limitations

- Uncertainty that athletes adhered to diet
- Study population was limited, findings cannot be generalized to entire female athlete population

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