Statistical Analysis Plan (SAP)

Study Title

High-Intensity Interval Training Improves the Reactive Strength Index and Motor Ability of Youth Football Players

Principal Investigator

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Study Objectives

To examine the effects of a 4-week high-intensity interval training (HIIT) program on reactive strength index (RSI), countermovement jump (CMJ), sprint performance (10m, 20m, 30m), agility, and back strength in youth football players.

Analysis Population

All randomized participants who completed the pre- and post-tests will be included in the analysis (per-protocol analysis).

Outcome Measures

- Primary Outcome: Reactive Strength Index (RSI)
- Secondary Outcomes: CMJ, 10m/20m/30m sprint times, Illinois agility test score, and back strength

Descriptive Statistics

Means and standard deviations (SD) will be calculated for all continuous variables. Normality will be assessed using the Shapiro-Wilk test.

Comparative Analysis

A two-way repeated-measures ANOVA will be performed to assess group (HIIT vs. control) × time (pre vs. post) interactions. Bonferroni-adjusted post hoc tests will be used to examine significant interactions.

Effect Sizes

Partial eta squared (ηp^2) will be calculated to determine the magnitude of the effects. Thresholds: small ($\geq .01$), medium ($\geq .06$), large ($\geq .14$).

Significance Level

Statistical significance will be set at $p < .05$ for all analyses.

Software

All analyses will be conducted using IBM SPSS Statistics version 25.0.

Handling of Missing Data

All participants completed both pre- and post-test measurements without any missing data. Therefore, no data imputation was required or performed.

Subgroup or Sensitivity Analyses

No planned subgroup or sensitivity analyses will be conducted.