Research Protocol

Title

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

1. Background and Rationale

High-intensity interval training (HIIT) has been widely used to improve explosive strength and motor skills in youth athletes. However, its specific effects on the reactive strength index (RSI) and motor ability in 11–13-year-old male football players remain under-investigated. This study aims to address this gap.

2. Objectives

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

3. Study Design

A pretest-posttest, parallel-group randomized controlled trial with blinded outcome assessors.

4. Setting and Participants

The study was conducted on a natural grass football field in Turkey. Participants were 20 male football players aged 11 to 13 who engaged in regular training.

5. Inclusion and Exclusion Criteria

Inclusion: male, 11–13 years old, enrolled in a football club, no health conditions.
Exclusion: chronic illness, musculoskeletal injury in the past year, use of ergogenic aids.

6. Interventions

The experimental group underwent 3 HIIT sessions per week for 4 weeks, each session consisting of 2 sets of 6 x 15-second sprints at 80–90% intensity, with 30 seconds rest between sprints. The control group continued only their regular football training.

7. Outcomes

Primary outcome: Reactive Strength Index (RSI).
Secondary outcomes: CMJ, 10m/20m/30m sprints, Illinois agility test, back strength.

8. Randomisation and Blinding

Randomisation was performed using a computer-generated sequence in Microsoft Excel with a block size of 4. The allocation sequence was created in advance and concealed from assessors to prevent bias. No sealed envelopes were used, as Excel-based randomisation was deemed sufficient given the small sample size and proper blinding.

9. Sample Size

A sample size of 10 participants per group was calculated using G*Power, based on 80% power, $\alpha = 0.05$, and an effect size of 0.8.

10. Statistical Methods

A two-way repeated-measures ANOVA was used for group and time interactions. Bonferroni-corrected post hoc tests were conducted. Partial eta squared (ηp^2) was reported as effect size. Significance set at $p < .05$.

11. Ethical Approval and Trial Registration

Approved by Bitlis Eren University Non-Interventional Clinical Research Ethics Committee (Date: 02.01.2025, No: 13). Registered at ISRCTN (Retrospectively Registered).

12. Data Management

Data analyzed using SPSS v25.0. All data were de-identified and securely stored in password-protected institutional computers.