STUDY PROTOCOL

Title: Effects of Whole-Body High-Intensity Interval Training and Moderate-Intensity Continuous Training on Immune Function

Unique Protocol ID: 2020-189

Principal Investigator: Melih Çalışır

Institution: Bitlis Eren University

Date: 16.05.2026

Background and Rationale

Regular physical exercise is known to influence immune function through modulation of inflammatory and hematological parameters. However, the comparative effects of Whole-Body High-Intensity Interval Training (WB-HIIT) and Moderate-Intensity Continuous Training (MICT) on immune markers remain unclear.

Objective

To compare the effects of WB-HIIT and MICT on immune function, inflammatory cytokines, hormonal response, and aerobic capacity in healthy young males.

Study Design

Randomized controlled parallel-group trial.

Group 1: WB-HIIT (Experimental)

Group 2: MICT (Active Comparator)

Duration: 8 weeks

Participants

Healthy male adults aged 18–25 years.

Sample size: n = 20 (10 per group)

Intervention

WB-HIIT Group: Whole-body high-intensity interval training performed under supervision, 3–4 sessions/week.

MICT Group: Moderate-intensity continuous aerobic training performed under supervision, 3–4 sessions/week.

Outcomes

Primary Outcomes: Peripheral immune cell counts (leukocytes, lymphocytes, neutrophils, monocytes) Inflammatory cytokines (IL-6, TNF-α, CRP)

Secondary Outcomes: Immunoglobulins (IgA, IgG, IgM) Cortisol levels VO_2max

Data Collection

Measurements at: Baseline Post-intervention (8 weeks)

Statistical Analysis

Normality will be assessed using the Shapiro-Wilk test.

Intergroup comparisons will be made using the independent t-test or the Mann-Whitney U test.

Within-group variations will be analyzed using the paired t-test or the Wilcoxon test. The significance level is set at $p < 0.05$.

Ethics

Study conducted in accordance with the Declaration of Helsinki and approved by institutional ethics committee. Written informed consent obtained from all participants.

STATISTICAL ANALYSIS PLAN

1. Data Handling

Data analyzed using SPSS / R

Missing data handled using listwise deletion

2. Normality Testing

Shapiro–Wilk test applied to all variables

3. Between-Group Analysis

Independent samples t-test

Mann–Whitney U test (if non-normal)

4. Within-Group Analysis

Paired t-test

Wilcoxon signed-rank test

5. Effect Size

Cohen's d for parametric tests

r for non-parametric tests

6. Significance Level

$p < 0.05$ (two-tailed)

7. Software

IBM SPSS Statistics / R Statistical Software

INFORMED CONSENT FORM (ICF)

Title:

Participation Information and Informed Consent Form

Study Title:

Effects of Whole-Body HIIT and Moderate Continuous Exercise on Immune Function

Purpose of Study

You are invited to participate in a research study investigating the effects of different exercise programs on immune function and health-related physiological parameters.

Procedures

If you agree to participate, you will be randomly assigned to one of two exercise groups:

High-Intensity Interval Training (WB-HIIT)

Moderate Continuous Training (MICT)

You will participate in supervised exercise sessions for 8 weeks.

Risks

Possible risks include:

Temporary muscle soreness

Fatigue

Mild injury risk during exercise

Benefits

No guaranteed benefit

Possible improvement in fitness and health markers

Confidentiality

All personal data will be kept confidential and coded. Results will be published in aggregate form only.

Voluntary Participation

Participation is voluntary. You may withdraw at any time without penalty.

Contact Information

Principal Investigator: Melih Çalışır

Email: mlhclsr@gmail.com

Institution: Bitlis Eren University

Consent Statement

I have read and understood the information above. I voluntarily agree to participate.

Signature: _____

Date: _____