

## **STUDY PROTOCOL**

**Official Study Title:** Effects of Powerlifting-Based Training in Athletes

**ClinicalTrials.gov Identifier:** NCT Not Yet Assigned

**Unique Protocol ID:** E-31679287-663.05-523405

**Document Type:** Study Protocol

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**Sponsor / Institution:** Dicle University

## **1. Background**

Powerlifting-based resistance training is widely used to improve muscular strength, neuromuscular adaptations, and athletic performance. In recent years, interest has increased in understanding the physiological responses associated with structured strength training programs, particularly their effects on hormonal, metabolic, and lipid profile parameters. Hormonal responses such as testosterone, cortisol, growth hormone, and thyroid hormones play a critical role in adaptation to resistance exercise. Additionally, metabolic and lipid profile markers provide valuable information regarding cardiometabolic health and training-induced adaptations. However, evidence regarding short-term powerlifting-based interventions in trained athletes remains limited. This study aims to investigate the physiological effects of a structured powerlifting-based training program in male athletes using a randomized controlled design.

## **2. Objectives**

### **Primary Objective**

To evaluate the effects of a powerlifting-based training program on hormonal parameters in athletes.

### **Secondary Objectives**

To examine changes in metabolic markers following the intervention

To assess alterations in lipid profile parameters

To compare outcomes between intervention and control groups

## **3. Study Design**

This study is designed as a randomized controlled trial with a parallel-group design.

**Study Type:** Interventional

**Allocation:** Randomized

**Masking:** None (Open Label)

**Number of Arms:** 2

**Study Duration:** 8 weeks

**Study Setting:** University-based sports science laboratories

## **4. Participants**

### **Inclusion Criteria:**

Male athletes aged 18–24 years

Minimum of two years of regular sports participation

Actively training in basketball

Voluntary participation with written informed consent

### **Exclusion Criteria:**

Musculoskeletal injury or surgery within the last 6 months

Presence of chronic disease or metabolic disorder

Use of hormonal or performance-enhancing substances

Participation in another structured training program

### **5. Interventions**

#### **Arm 1: Powerlifting-Based Training Group**

Participants will perform a structured powerlifting-based training program in addition to their regular basketball training.

#### **Training characteristics:**

**Frequency:** 3 sessions per week

**Duration:** 8 weeks

**Session length:** ~60 minutes

**Exercises:** Squat, bench press, deadlift

**Intensity:** Progressive loading

**Additional components:** accessory exercises and core training

**Supervision:** All sessions supervised by qualified staff

#### **Arm 2: Control Group**

Participants will continue their usual basketball training routines without any additional strength or powerlifting-based exercises.

### **6. Outcome Measures**

#### **Primary Outcomes**

Measured at baseline and after 8 weeks:

Serum total testosterone (ng/dL)

Serum cortisol (μg/dL)

Serum growth hormone (ng/mL)

Serum thyroid-stimulating hormone (μIU/mL)

Serum triiodothyronine (ng/dL)

Serum thyroxine (μg/dL)

(All measured using ELISA methods)

#### **Secondary Outcomes**

Fasting insulin ( $\mu$ IU/mL)

Fasting blood glucose (mg/dL)

Total cholesterol (mg/dL)

LDL cholesterol (mg/dL)

HDL cholesterol (mg/dL)

Triglycerides (mg/dL)

(All analyzed using automated biochemical analyzers)

## **7. Statistical Analysis**

Data will be analyzed using appropriate statistical software.

Descriptive statistics will be calculated for all variables.

Normality will be assessed using the Shapiro–Wilk test.

Between-group comparisons will be performed using independent samples t-tests or non-parametric equivalents.

Within-group comparisons will be performed using paired t-tests.

Statistical significance will be set at  $p < 0.05$ .

## **8. Ethical Considerations**

This study has been approved by the Ethics Committee of Dicle University (Approval No: E-31679287-663.05-523405).

All participants will provide written informed consent prior to participation. The study will be conducted in accordance with the Declaration of Helsinki.

## **9. Data Sharing Statement**

Individual participant data will not be shared due to ethical restrictions and confidentiality concerns.

## **10. Contact Information**

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