Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Evaluation the role of eight weeks of SAQ and sprint interval training on mitochondrial indices and cell-free DNA concentration in soccer players along with consumption of sports drinks.

Protocol summary

Study aim
The role of eight weeks of SAQ and sprint interval training on mitochondrial indices and cell-free DNA concentration in soccer players along with sports drink consumption

Design
A randomized, double-blind, parallel-group, controlled clinical trial on 56 football players. The Excel RAND function will be used for randomization.

Settings and conduct
Study setting: Molecular and Cellular Physiology Laboratory, Medicinal Plants House, Isfahan; Study population: Male soccer players; Type of blinding: Double-blind; Method of blinding: Subjects and outcome assessor were unaware of the groups and supplement.

Participants/Inclusion and exclusion criteria
Inclusion criteria: male football players; aged 14–15 years; no musculoskeletal abnormalities; informed consent from parents/guardians; no consumption of supplements/medications (except standard multivitamins); completion of the PAR-Q questionnaire and normal pre-exercise ECG. Exclusion criteria: history of known cardiovascular or pulmonary diseases; presence of acute or chronic limb injuries within the past 6 months; tobacco or alcohol consumption; metabolic diseases such as diabetes.

Intervention groups
Intervention group 1: SAQ group (agility/speed drills), Intervention group 2: SIT (interval sprints), Intervention group 3: SAQ group (agility/speed drills) with stretching recovery and Spirulina drink consumption, Intervention group 4: SIT (interval sprints) with stretching recovery and Spirulina drink consumption.

Main outcome variables
Changes in the expression levels of genes related to cell death and mitochondria, citrate synthase concentration, and cfDNA concentration

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20250517065774N4**
Registration date: **2026-09-13, 1405/06/22**
Registration timing: **prospective**

Last update: **2026-09-13, 1405/06/22**
Update count: **0**

Registration date
2026-09-13, 1405/06/22

Registrant information

Name
Navid Abedpoor

Name of organization / entity

Country
Iran (Islamic Republic of)

Phone
+98 913 121 1552

Email address
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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2026-09-22, 1405/06/31

Expected recruitment end date
2026-09-22, 1405/06/31

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
Evaluation the role of eight weeks of SAQ and sprint interval training on mitochondrial indices and cell-free DNA concentration in soccer players along with consumption of sports drinks.

Public title
Effects of exercise training and sports drink on cellular markers in soccer players

Purpose
Basic scienece

Inclusion/Exclusion criteria

Inclusion criteria:
Male Age of 14-15 years old No musculoskeletal abnormalities With informed consent from the player's parents. No supplements/medications (except a standard multivitamin) Completion of the PAR-Q questionnaire and normal pre-exercise ECG

Exclusion criteria:
History of known cardiovascular or pulmonary diseases Presence of acute or chronic injuries in limbs over the past 6 months Smoking or alcohol consumption Having metabolic disorders such as diabetes

Age
From **14 years** old to **15 years** old

Gender
Male

Phase
2-3

Groups that have been masked

- Investigator
- Data analyser

Sample size
Target sample size: **56**

Randomization (investigator's opinion)
Randomized

Randomization description
To use the random number table, the researcher will first determine the table's reading direction. Then the numbers will be considered for different groups. For example, numbers 14-00 for group A, numbers 15-29 for intervention B, numbers 44-30 for group C, and 45-59 for group D. Then, we will place our hands on one of the numbers and move in one of the predetermined directions. The numbers will be recorded and assigned to four groups: SAQ group (agility/speed drills); SIT (intermittent sprints) with stretching recovery and Spirulina drink consumption; SAQ group (agility/speed drills) with stretching recovery and Spirulina drink consumption; and SIT (intermittent sprints) with stretching recovery and Spirulina drink consumption. To conceal the random allocation, the coded-box method with random sequences will be used. This method uses several boxes numbered in a random sequence. It will be ensured that the boxes are sufficiently sealed, identical in appearance, and equal in weight.

Blinding (investigator's opinion)
Double blinded

Blinding description
In this study, the analyst, statistician, specialist assistant, coach and physiologist were unaware of the entire study process. The blinding process included allocation concealment through sealed envelopes and spirulina drink consumption, standardized exercise training protocols, and outcome assessment by an independent blinded team with automated digital devices coupled with an emergency controlled disclosure mechanism designed for emergencies. In order to blind the consumption of spirulina drink, all the participants in the recovery stage are given a simple drink in dark bottles so that the color of the drink is not clear.

Placebo
Used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Ethics Committee on Research Islamic Azad University - Isfahan Branch (Khorasgan)

Street address
Daneshgah Boulevard, Arghavanieh, East Gey Street, Isfahan

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Province
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Postal code
8155139998

Approval date
2026-07-28, 1405/05/06

Ethics committee reference number
IR.IAU.KHUISF.REC.1405.224

Health conditions studied

1

Description of health condition studied
Mitochondrial indices and cell free DNA concentration and cell death

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description
Gene expression of PGC-1a in peripheral blood mononuclear cells in young soccer players

Timepoint
At the beginning and end of the study after 8 weeks

Method of measurement

Real-time qPCR

2

Description
Citrate synthetase concentration
Timepoint
At the beginning and end of the study after 8 weeks
Method of measurement
Elisa Kit

3

Description
Serum cfDNA concentration
Timepoint
At the beginning and end of the study after 8 weeks
Method of measurement
cfDNA concentration assay kit

4

Description
Gene expression of COX in peripheral blood mononuclear cells in young soccer players
Timepoint
At the beginning and end of the study after 8 weeks
Method of measurement
Real-time qPCR

5

Description
Gene expression of MFN2 in peripheral blood mononuclear cells in young soccer players
Timepoint
At the beginning and end of the study after 8 weeks
Method of measurement
Real-time qPCR

Secondary outcomes

1

Description
Aerobic power
Timepoint
At the beginning and end of 8 weeks of study
Method of measurement
Yo-Yo Aerobic Endurance Test Level 1

2

Description
Anaerobic Resistance
Timepoint
At the beginning and end of 8 weeks of study
Method of measurement
RAST field test

3

Description
Dribbling speed skills in Soccer
Timepoint
At the beginning and end of 8 weeks of study
Method of measurement
Ronaldo's dribbling speed test (Hulichi et al., 2014; Wood, 2024)

4

Description
Peak power and Average power
Timepoint
At the beginning and end of 8 weeks of study
Method of measurement
Reciprocal Sargent test using the formula: Peak power (W) = 78.5 x VJ (cm) + 60.6 x mass (kg) -15.3 x height (cm) -1308 and the formula: Average power (W) = 41.4 x VJ (cm) + 31.2 x mass (kg) -13.9 x height (cm) + 431

Intervention groups

1

Description
Intervention group 1: SAQ group (Agility/Speed Drills): Perform SAQ (Speed, Agility, Quickness) exercises and include a 10-minute warm-up with light jogging and dynamic movements, 10-30 meter sprint speed exercises, agility and direction changes, and quickness and reaction exercises. The intensity of the exercise is set in the range of 85-95% of maximum heart rate and the duration of each session is 30-40 minutes.
Category
Other

2

Description
Intervention group 2: SIT group: The SIT protocol consisted of four sets of maximal-intensity sprints interspersed with short recovery periods between sets and longer recovery periods between sets.
Category
Other

3

Description
Intervention group 3: SAQ group (agility/speed drills) + recovery with stretching and consumption of 500 mg of spirulina drink.
Category
Other

4

Description
Intervention group 4: SIT group + recovery with stretching and consumption of 500 mg of Spirulina drink.
Category
Other

Recruitment centers

1

Recruitment center

Name of recruitment center
Setaregan Talayi Football Cultural and Sports Club

Full name of responsible person
Navid Abedpoor

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University of Isfahan, Daneshgah Street, Azadi Square, Isfahan, Iran. Postal Code: 8174673441

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Islamic Azad University

Full name of responsible person
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Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?
Yes

Title of funding source
Islamic Azad University

Proportion provided by this source
100

Public or private sector
Public

Domestic or foreign origin
Domestic

Category of foreign source of funding
empty

Country of origin

Type of organization providing the funding
Academic

Person responsible for general inquiries

Contact

Name of organization / entity
Islamic Azad University

Full name of responsible person
Navid Abedpoor

Position
Assistant professor

Latest degree
Ph.D.

Other areas of specialty/work
Physiology

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Undecided - It is not yet known if there will be a plan to make this available

Study Protocol
Undecided - It is not yet known if there will be a plan to make this available

Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available

Informed Consent Form
Undecided - It is not yet known if there will be a plan to make this available

Clinical Study Report
Undecided - It is not yet known if there will be a plan to make this available

Analytic Code
Undecided - It is not yet known if there will be a plan to make this available

Data Dictionary
Undecided - It is not yet known if there will be a plan to make this available