Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

Acute Effects of Caffeine, L-Theanine, and Their Combination on Sprint, Jump, Change-of-Direction, and Repeated-Sprint Performance in Trained Adolescent Soccer Players: A Randomized, Double-Blind, Crossover Trial

Protocol summary

Study aim

Effects of caffeine, L-theanine, and their combination on the physical performance of adolescent soccer players compared to a placebo.

Design

A randomized, double-blind, placebo-controlled, four-condition crossover clinical trial will be conducted in 16 trained male adolescent soccer players. Each participant will receive all four conditions: caffeine, L-theanine, caffeine plus L-theanine, and placebo. Participants will be randomly allocated to one of four treatment sequences using a simple lottery procedure with identical cards, with four participants assigned to each sequence.

Settings and conduct

This study will be conducted at Zob Ahan Football Club in Isfahan, Iran. Eligible participants will complete four experimental sessions separated by a 7-day washout period and will receive one of the following conditions at each session. Following administration of the intervention, performance tests including sprint, jump, change-of-direction, and repeated-sprint tests will be performed. Participants, performance assessors, and the statistical analyst will be blinded to treatment allocation, with experimental conditions identified using treatment codes.

Participants/Inclusion and exclusion criteria

Male participants aged 16 to 18 with a body mass index (BMI) of 18.5 to 24.5, at least two years of regular soccer training experience, physician-confirmed general health, and no known sensitivity to caffeine or L-theanine.

Intervention groups

Participants will undergo four experimental conditions (in a crossover design), caffeine (3 mg/kg body mass), L-theanine (3 mg/kg body mass), caffeine plus L-theanine (3 mg/kg body mass each), and placebo. All interventions will be administered as capsules 60 minutes before testing.

Main outcome variables

20-meter sprint time; standing long jump distance; change-of-direction test time; repeated sprint time.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20190530043762N5**
Registration date: **2026-10-02, 1405/07/10**
Registration timing: **prospective**

Last update: **2026-10-02, 1405/07/10**
Update count: **0**

Registration date

2026-10-02, 1405/07/10

Registrant information

Name

Alireza Niknam

Name of organization / entity

Shiraz University

Country

Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-10-07, 1405/07/15

Expected recruitment end date

2026-10-22, 1405/07/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Acute Effects of Caffeine, L-Theanine, and Their Combination on Sprint, Jump, Change-of-Direction, and Repeated-Sprint Performance in Trained Adolescent Soccer Players: A Randomized, Double-Blind, Crossover Trial

Public title

Effects of Caffeine, L-Theanine, and Their Combination on Physical Performance in Adolescent Soccer Players

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

The age range should be 16 to 18 years. The Body Mass Index (BMI) should be within the normal range (18.5–24.5). The gender of the samples must be male. The subjects must have at least two years of experience participating in regular soccer training. The participants' general health must be confirmed by a physician. Participants must not have a known sensitivity to caffeine or theanine.

Exclusion criteria:

History of musculoskeletal injury preventing participation in sports activities Use of prohibited ergogenic substances according to the World Anti-Doping Agency. Lack of consent from participants to take part in the study process.

Age

From **16 years** old to **18 years** old

Gender

Male

Phase

3

Groups that have been masked

- Participant
- Outcome assessor
- Data analyser

Sample size

Target sample size: **16**

Randomization (investigator's opinion)

Randomized

Randomization description

Randomization will be performed at the individual level using a simple randomization procedure. Four balanced treatment sequences will be predetermined for allocation of participants to the four treatment sequences. These four sequences will be: caffeine–caffeine and L-theanine combination–placebo–L-theanine; L-theanine–caffeine–caffeine and L-theanine combination–placebo; placebo–L-theanine–caffeine–caffeine and L-theanine combination; and caffeine and L-theanine combination–placebo–L-theanine–caffeine. Each sequence will be written on four identical cards; therefore, a total of 16 sequence cards will be prepared. In addition, the identification number of each of the 16 participants will be written on a separate identical card. The sequence cards and participant identification cards will be placed in two separate opaque containers. Random allocation will be performed by an independent investigator who will not be involved in intervention administration, outcome assessment, or experimental procedures. At each allocation step, one sequence card will be randomly drawn from the sequence container and one participant identification card will then be randomly drawn from the second container. The selected participant will be assigned to the treatment sequence indicated on the selected sequence card. This procedure will be repeated until all 16 participants have been allocated, resulting in four participants assigned to each treatment sequence. The unit of randomization will be the individual participant, and neither cluster randomization nor stratified randomization will be used. The random sequence will be generated and allocated using a manual lottery procedure with identical and indistinguishable cards, and no statistical software or random-number table will be used. For allocation concealment, the treatment-sequence cards will be kept in a separate container from the participant-identification cards. The investigator responsible for randomization will be independent of the researchers involved in intervention administration and outcome assessment. Therefore, the treatment sequence assigned to each participant will not be known until the lottery procedure has been performed and the cards have been drawn from the two separate containers.

Blinding (investigator's opinion)

Double blinded

Blinding description

The study will be conducted using a double-blind design. Participants will be blinded to the identity of the capsules and will not be informed of their assigned treatment condition. Active and placebo capsules will be visually identical and will be administered in the same number and manner across all experimental conditions. The investigators responsible for performance testing and outcome assessment will also remain blinded to treatment allocation throughout all stages of data collection. The statistical analyst will likewise be blinded to treatment identity during the statistical analyses, with the experimental conditions represented by treatment codes rather than their actual condition names. The treatment codes will be maintained by an investigator who will not be involved in outcome assessment. These codes will not be disclosed to the research team or the statistical analyst until completion of all experimental procedures and the primary statistical analyses. Thus, the identity of the treatment conditions will remain concealed throughout the experimental procedures and primary statistical analyses.

Placebo

Used

Assignment

Crossover

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Research Ethics Committees of Faculty of Psychology and Educational Sciences

Street address
Jomhoori Eslami Blvd

City
Shiraz

Province
Fars

Postal code
7194684334

Approval date
2026-07-15, 1405/04/24

Ethics committee reference number
IR.US.PSYEDU.REC.1405.078

Health conditions studied

1

Description of health condition studied
Physical Activity and Exercise Performance

ICD-10 code
Y93.B

ICD-10 code description
Activities involving other muscle strengthening exercises

Primary outcomes

1

Description
The 20-meter sprint time will be measured as the time required to cover a distance of 20 meters at maximum possible speed. Following a standard warm-up, participants will perform three maximal-effort sprints, with a minimum of one minute of passive rest between trials. The time for each trial will be recorded using an optical timing system, and the fastest time_measured in seconds_will be taken as the outcome value for each testing session.

Timepoint
The 20-meter sprint time during each of the four testing sessions will be measured at two time points: first, following a standard warm-up and prior to the start of the repeated-sprint test; and second, immediately after the completion of the repeated-sprint test and a two-minute rest period. The four testing sessions will be conducted with a seven-day washout period between them.

Method of measurement
DesiKala digital optical timing device with a measurement precision of 0.001 seconds.

2

Description
The standing long jump distance is measured as the horizontal distance from the starting line to the point where the heel makes its nearest contact with the ground following a maximal jump. After a standard warm-up, participants will perform three maximal-effort trials, with a one-minute passive rest period between attempts. The longest jump recorded, measured in centimeters, will be taken as the outcome value for the testing session.

Timepoint
Standing long jump distance will be measured at two time points during each of the four testing sessions: first, following a standard warm-up and prior to the repeated sprint test; and second, immediately after the completion of the repeated sprint test and a two-minute rest period. The four testing sessions will be conducted with a seven-day washout period between them.

Method of measurement
A graduated, standard tape measure for measuring the horizontal jump distance, with results recorded in centimeters.

3

Description
Change-of-direction time will be measured as the time required to complete the standard Illinois change-of-direction test at maximum speed. Participants will perform two maximal-effort trials, with a two-minute passive rest period between them. The completion time for each trial will be recorded using an optical timing system, and the fastest time—measured in seconds—will be taken as the outcome value for each testing session.

Timepoint
The change-of-direction test time during each of the four experimental sessions will be measured at two time points: first, following a standard warm-up and prior to the repeated-sprint test; and second, immediately after the completion of the repeated-sprint test and a two-minute rest period. The four experimental sessions will be conducted with a seven-day washout period between them.

Method of measurement
DesiKala digital optical timing device with a measurement precision of 0.001 seconds.

Secondary outcomes

1

Description
Rate of Perceived Exertion (RPE) will be measured as the participants' subjective perception of the exertion intensity resulting from the Repeated Sprint Test. This variable will be recorded using the 10-point Rating of Perceived Exertion scale (Borg CR10 scale).

Timepoint
The Rate of Perceived Exertion (RPE) will be recorded at each of the four experimental sessions: immediately before the start of the Repeated Sprint Test and

immediately following the completion of each of the three test blocks. Thus, four measurements will be taken per session, consisting of one pre-test measurement and three post-exercise measurements (after the first, second, and third blocks, respectively). The four experimental sessions will be separated by a seven-day washout period.

Method of measurement

Borg 10-point Category-Ratio (CR10) scale

Intervention groups

1

Description

Placebo condition: In this condition, participants will receive two capsules that are visually identical to the active ingredient capsules. One capsule will serve as the caffeine placebo and the other as the L-theanine placebo. Both capsules will be ingested simultaneously 60 minutes prior to the commencement of the functional tests."

Category

Placebo

2

Description

First intervention group_ Caffeine condition: Participants will ingest one capsule containing caffeine (3 mg·kg^{-1} body mass) and one L-theanine placebo capsule. Both capsules will be ingested simultaneously 60 minutes prior to the commencement of the functional tests.

Category

Rehabilitation

3

Description

Second intervention group _ L-Theanine Condition: In this condition, participants will receive one caffeine placebo capsule and one capsule containing L-theanine at a dose of 3 mg·kg^{-1} of body mass. Both capsules will be ingested simultaneously 60 minutes prior to the commencement of the functional tests.

Category

Rehabilitation

4

Description

Third intervention group _ Caffeine + L-Theanine Condition: In this condition, participants will receive one capsule containing caffeine at a dose of 3 mg·kg^{-1} of body mass and one capsule containing L-theanine at a dose of 3 mg·kg^{-1} of body mass. Both capsules will be ingested simultaneously 60 minutes prior to the commencement of the functional tests.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center
Zob-Ahan soccer club

Full name of responsible person
Kamran Tahmasebi

Street address
Zob Ahan Joint Stock Company Office Complex, Shafaq Boulevard, Zob Ahan Highway, Isfahan

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Province
Isfehan

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kamran.tsbii@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Shiraz 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
Shiraz University

Proportion provided by this source
100

Public or private sector
Private

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
Shiraz University
Full name of responsible person
Alireza Niknam
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Student
Latest degree
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alireza.niknam@yahoo.com

Sharing plan

Deidentified Individual Participant Data Set (IPD)
Yes - There is a plan to make this available
Study Protocol
Yes - There is a plan to make this available
Statistical Analysis Plan
Yes - There is a plan to make this available
Informed Consent Form
No - There is not a plan to make this available
Clinical Study Report
Not applicable
Analytic Code
No - There is not a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
De-identified individual participant data will be made available in a public data repository or as a supplementary file to the article following the publication of the study results. Prior to sharing, all data will be processed to remove participant-identifying information. The study protocol will be made available as a supplementary file to the article or in a public scientific repository after the study is completed and the main results are published. The statistical analysis plan will be made available as a supplementary file to the article or in a public scientific repository after the study is completed and the main results are published. A data dictionary—including variable names, definitions, units of measurement, and coding schemes—will be made available alongside the de-identified individual participant data.
When the data will become available and for how long
The period for accessing data and documentation will

begin one week after the publication of the results.

To whom data/document is available

Researchers working in academic and scientific institutions

Under which criteria data/document could be used

The study data and documentation may be used solely for research and scientific purposes, including conducting secondary research, re-analyzing data, and verifying or replicating study results. Access to individual-level data is contingent upon the de-identification of participant information and adherence to principles of confidentiality, privacy, and ethical requirements regarding the use of research data. Data usage must be strictly confined to scientific and research objectives, with no attempt to re-identify participants

From where data/document is obtainable

Applicants may request access to the study's data and documentation by contacting the principal investigator or corresponding author via the email address listed on the study's official webpage or in the published article. The designated contact person is Dr. Alireza Niknam (email: Alireza73.Niknam@gmail.com). Requests will be evaluated based on the research objective and verification that participant confidentiality and anonymity are maintained; upon approval, the relevant data or documentation will be provided to the applicant.

What processes are involved for a request to access data/document

Requests for data or documentation will be reviewed by the principal investigator or the research team. The applicant must specify the purpose and intended use of the requested data or documentation. Following the initial review, the request will be evaluated for alignment with scientific objectives, adherence to confidentiality requirements, and the assurance of participant anonymity. Upon approval, the requested data or documentation will be provided to the applicant in an appropriate format. The use of data to re-identify participants or for purposes inconsistent with research ethics principles is prohibited.

Comments