Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparison of the Effects of Unstable and Stable Loaded Plyometric Training on Some Physical Fitness Factors in Pas Gorgan Volleyball Team Players

Protocol summary

Study aim
Study and comparison of the effects of unstable and stable loaded plyometric training on some physical fitness factors of Gorgan Pass volleyball team players

Design
A controlled, parallel-group, single-blind, randomized, phase 2 clinical trial on 21 subjects. The rand function of Excel is used for randomization.

Settings and conduct
This study is a randomized, parallel-group trial that will be conducted in the training hall of the Gorgan Pas volleyball team.Participants will be randomly assigned to three groups for a 12-week intervention (three sessions/week). Participants were unaware of their group allocation, and data analysis was performed by an independent, blinded analyst.

Participants/Inclusion and exclusion criteria
Participants will include male volleyball players from the Gorgan Pas Volleyball Team who have at least two years of experience participating in the Premier League and who practice volleyball for at least 17 hours per week. Inclusion criteria will include: general health, no restrictions on practice, and written consent from the player. Exclusion criteria will include: any history of acute or chronic musculoskeletal injury or not being a member of a team.

Intervention groups
(ULPT) Participants will perform unstable loaded plyometric jumping exercises for 12 weeks (3 sessions per week). The training will include CMJ jumps. The number of jumps will increase from 72 in the first session to 140 in the final sessions. The work-to-rest ratio will be 1:7 and the interval between exercises will be 2 minutes. Each session will last 15–25 minutes. Intervention group 2 (SLPT) will perform the same protocol as the ULPT group, except that they will train with a stable load. (CON) Participants will simply continue their usual volleyball training during the 12 weeks.

Main outcome variables
Jumping performance, balance performance, agility performance, linear speed performance

General information

Reason for update

Acronym
ULPT=Unstable Loaded Plyometric Training

IRCT registration information
IRCT registration number: **IRCT20250905067129N2**
Registration date: **2026-04-21, 1405/02/01**
Registration timing: **prospective**

Last update: **2026-04-21, 1405/02/01**
Update count: **0**

Registration date
2026-04-21, 1405/02/01

Registrant information

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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2026-05-05, 1405/02/15

Expected recruitment end date

2026-08-06, 1405/05/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of the Effects of Unstable and Stable Loaded Plyometric Training on Some Physical Fitness Factors in Pas Gorgan Volleyball Team Players

Public title

Unstable Loaded Plyometric Training

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

Age range: 18-28 years sports history of participating in league competitions for at least 2 years, ability to jump vertically at least 45 cm be completely medically healthy and have no problems performing sports related to the research have no cardiovascular problems Avoid using stimulants and certain medications (steroids). Player of the Gorgan Pas volleyball team

Exclusion criteria:

History of acute or chronic musculoskeletal injuries/disorders of the ankles, knees, or back History of cardiovascular disease and problems in the participant. Taking steroid medications. Tobacco and alcohol consumption

Age

From **18 years** old to **28 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Participant
- Data analyser
- Data and Safety Monitoring Board

Sample size

Target sample size: **21**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, the process of assigning participants to groups will be carried out with a combined approach of initial pairing (pair-matching) and simple randomization to reduce initial heterogeneity between groups on the one hand and ensure true randomization on the other. First, all participants will be grouped into pairs of equal jumping ability based on the results of the vertical jump test (Jump-and-Reach) at the beginning of the study. This pairing method will be used to initially balance the jumping ability in the groups. Then, in each pair, assignment to study groups will be done randomly. Microsoft Excel software and the (RAND) function will be used to generate the random sequence. A random number will be generated for each individual and based on the ascending sorting of these numbers, participants will be divided into three study groups including: 1. Unstable Loaded Plyometric Training (ULPT) group, 2. Stable Loaded Plyometric Training (SLPT) group, and 3. The active control group (CON) will be allocated. The randomization unit in this study will be individual-based. The randomization sequence will be generated and maintained by one of the researchers who is not involved in data collection and analysis. To maintain confidentiality and prevent any possible bias in the allocation process, the randomization sequence will be placed in opaque, sealed, and numbered envelopes and will only be returned at the time of allocation of each participant. Thus, the randomization process in this study will both reduce the initial heterogeneity between groups and fully respect the random nature of the allocation of participants.

Blinding (investigator's opinion)

Single blinded

Blinding description

In this study, blinding will be performed in a single-blind manner. Participants will be unaware of their group assignment and the exact purpose of the intervention. In addition, data analysis will be performed by a consulting statistician who is unaware of the group assignment. However, the intervention and functional test administrator will be aware of the group assignment due to the nature of the research and the need to monitor the correct implementation of the exercises. Thus, in this study, blinding will be observed at the level of participants and data analyst, but there will be no possibility of blinding the test administrator.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Deputy of Health, Relief and Treatment, Police Command of the Islamic Republic of Iran - Shahid Behe

Street address

Tehran, Valiasr St., above Vanak Square, opposite Zafar, Hazrat Valiasr Hospital, Applied Research Center of the Deputy of Health Services of NAJA

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Province

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Postal code

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Approval date

2026-02-09, 1404/11/20

Ethics committee reference number

IR.SBMU.TEB.POLICE.REC.1404.018

Health conditions studied

1

Description of health condition studied

Volleyball players' performance

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Sargent's jump height

Timepoint

1. Initial measurement (pre-test) of Sargent jump height in week 0, before the start of training 2; Intermediate measurement at the end of week 4, 48 hours after the last training session, 3. Intermediate measurement at the end of week 8, 48 hours after the last training session, 4. Final measurement (post-test) at the end of week 12, 48 hours after the last training session

Method of measurement

For the Sargent jump height, hand height is initially assessed in a straight standing position with both feet in a lateral position close to the wall, the arm of the dominant hand fully extended in a vertical direction, and the fingers touching a wall-mounted tactile sensor connected to a digital display (Sargent Jumping Device, Danesh Salar Iranian, Iran). After that, participants perform a reverse movement (i.e., knee and hip flexion) with an arm swing immediately after a rapid and powerful vertical jump. The participants' task is to touch the scale mounted on the wall with their middle finger while flying at the highest position.

Secondary outcomes

1

Description

Depth jump

Timepoint

1. Initial measurement (pre-test) of Sargent jump height in week 0, before the start of training 2; Intermediate measurement at the end of week 4, 48 hours after the last training session, 3. Intermediate measurement at the end of week 8, 48 hours after the last training session, 4. Final measurement (post-test) at the end of week 12, 48 hours after the last training session

Method of measurement

The depth jump is performed by landing from a 40 cm box on firm ground and immediately jumping as high as possible. Participants are instructed to touch a scale mounted on the wall during the flight at the highest point. The jump height is defined as the difference between the height of the hand in the standing position and the height of the hand in the jumping position.

2

Description

Standing long jump

Timepoint

1. Initial measurement (pre-test) of standing long jump in week 0, before the start of training; 2. Intermediate measurement at the end of week 4, 48 hours after the last training session; 3. Intermediate measurement at the end of week 8, 48 hours after the last training session; 4. Final measurement (post-test) at the end of week 12, 48 hours after the last training session.

Method of measurement

To measure horizontal explosive power of the lower limbs, the subject will stand on the ground behind a designated starting line with both feet together. After a warm-up movement involving bending the knees and swinging the arms, the subject will jump forward with maximum force and attempt to cover as much distance as possible. The landing must be done with both feet simultaneously within the landing area. The distance from the front edge of the starting line to the heel of the foot closest to the landing area will be measured in centimeters using an accurate tape measure. Each subject will make three valid attempts and the best record will be recorded as the final result. A 2-minute rest period will be given between each attempt. Attempts in which the subject stands further than the permitted distance on the starting line or loses balance during landing will be considered invalid and will be repeated.

3

Description

Linear speed 10 meters

Timepoint

1. Initial measurement (pre-test) of 10-meter linear speed in week 0, before the start of training; 2. Intermediate measurement at the end of week 4, 48 hours after the last training session; 3. Intermediate measurement at the end of week 8, 48 hours after the last training session; 4. Final measurement (post-test) at the end of week 12, 48 hours after the last training session.

Method of measurement

To assess short-term linear acceleration and speed, subjects will perform a 10-meter sprint test. The subject will stand in a ready position behind the designated starting line and, upon the examiner's command, will begin an explosive run. The running time will be recorded using an accurate hand-held stopwatch from the moment of crossing the starting line to reaching the finish line at a distance of 10 meters. Each subject will make two valid attempts and the best record (the shortest time in seconds) will be recorded as the final result. A 3-minute rest period will be considered between attempts to prevent fatigue. Subjects will be required to run at maximum power in each attempt and not deviate from a straight line along the way.

4

Description

Agility T

Timepoint

1. Initial measurement (pre-test) of T agility in week 0, before the start of training; 2. Intermediate measurement at the end of the fourth week, 48 hours after the last training session; 3. Intermediate measurement at the end of the eighth week, 48 hours after the last training session; 4. Final measurement (post-test) at the end of the twelfth week, 48 hours after the last training session.

Method of measurement

The test route consists of four cones arranged in the shape of the letter T: one cone at the starting line, one 9.14 m in front of it, and two other cones each 4.57 m apart on either side of the middle cone. The subject will stand behind the starting line in a ready position and, at the command of the examiner, will begin an explosive run. First, he will run forward to the middle cone, then quickly shuffle to the right and touch the side cone, immediately move sideways to the left and touch the other cone, then move sideways again to the center, and finally run backwards to the starting line. The test time from the moment of departure until the complete crossing of the finish line will be recorded with a hand stopwatch. Each subject will have two valid attempts and the best time (the shortest time in seconds) will be recorded as the final record. A minimum of 3 minutes of rest will be given between each attempt.

5

Description

Dynamic balance Y

Timepoint

1. Initial measurement (pre-test) of dynamic balance Y in week 0, before the start of training 2; Intermediate measurement at the end of the fourth week, 48 hours after the last training session, 3. Intermediate measurement at the end of the eighth week, 48 hours after the last training session, 4. Final measurement (post-test) at the end of the twelfth week, 48 hours after the last training session.

Method of measurement

In this test, after a standard warm-up (light jogging and dynamic stretching), subjects will stand on the supporting (dominant) leg and touch the opposite leg as far as possible in three directions: anterior, posterior-medial, and posterolateral. The order of execution will consist of three attempts in each direction, and the best valid record will be recorded. During the execution, the supporting leg must remain completely fixed on the ground and the hands must be placed on the pelvis. Attempts in which the subject loses balance, the standing leg is moved, or the hands are used for assistance will be considered invalid and will be repeated. To prevent fatigue, a minimum of 30 seconds of rest will be given between each attempt. The test will be performed for the dominant leg.

Intervention groups

1

Description

Intervention group 1: Participants in this group performed unstable loaded plyometric exercises equivalent to 10% of body weight over a 12-week period (three sessions per week, a total of 36 sessions). The unstable load was provided by a barbell and two water-filled gimbal balls. The exercises were performed on the gym floor and included countermovement jumps. The intensity and volume of the exercise gradually increased, such that the number of jumps increased from 72 repetitions in the first session to 140 repetitions in the final sessions. Each session lasted 15 to 25 minutes, with a work-to-rest ratio of 1:7 and a two-minute rest interval between exercises. All sessions began with a RAMP warm-up protocol (light jogging, dynamic stretching, and submaximal jumps).

Category

Other

2

Description

Intervention Group 2: Participants in this group performed 10% of their body weight of sustained loading plyometric exercises over a 12-week period (three sessions per week, a total of 36 sessions). The unstable load was provided by a barbell and weights. The exercises were performed on the gym floor and included countermovement jumps. The intensity and volume of the exercise gradually increased, such that the number of jumps increased from 72 repetitions in the first session to 140 repetitions in the final sessions. Each session lasted 15 to 25 minutes, with a work-to-rest ratio of 1:7 and a two-minute rest interval between exercises. All sessions began with a RAMP warm-up protocol (light jogging, dynamic stretching, and submaximal jumps).

Category

Other

3

Description

Control group: Participants in the control group continued their normal volleyball training during the 12-week period. Their training consisted of typical team technical and tactical activities and did not receive any additional plyometric training or specific intervention. This group served as a comparison to determine the net effect of the plyometric interventions on the other two groups.

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center
Gorgan, Gorgan Pass Volleyball Team Training club.
Full name of responsible person
Parsa Soltani
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
National Defense University (Center for Elites and Top Talents of the Armed Forces)
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Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
No
Title of funding source
Police Command of the Islamic Republic of Iran
Proportion provided by this source
10
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
Other

Person responsible for general inquiries

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
No - There is not a plan to make this available
Justification/reason for indecision/not sharing IPD
To adhere to ethical principles and protect participants' personal and confidential information, the raw data (individual participant data) from this study will not be shared for public use or secondary research. However, if required, and solely to assure journal reviewers or editors of the accuracy of statistical analyses, the data will be provided confidentially.
Study Protocol
Yes - There is a plan to make this available
Statistical Analysis Plan
No - There is not a plan to make this available
Informed Consent Form
Yes - There is a plan to make this available
Clinical Study Report
No - There is not a plan to make this available
Analytic Code
No - There is not a plan to make this available
Data Dictionary
No - There is not a plan to make this available
Title and more details about the data/document
The Study Protocol, designed based on previous studies, along with the consent form, will be shared as a proprietary document. This protocol includes a comprehensive description of the study design, intervention methods, measured variables, and assessment timelines. The document will be provided as a PDF file upon formal request from reviewers or qualified researchers, subject to approval by the research committee. No individual participant raw data or identifiable information will be shared. Additionally, no analytical files or data dictionaries will be provided for public use or secondary research. Other documents will not be shared for public use or secondary research to comply with ethical principles and protect participants' personal and confidential information. However, if required, and solely to assure journal reviewers or editors of the accuracy of statistical analyses, the data will be provided confidentially.
When the data will become available and for how long
Access to the study protocol will begin six months after the publication of the final research results and will remain available for five years. The document will be provided only upon formal request from journal reviewers or qualified researchers, subject to approval by the research committee.
To whom data/document is available
The study data and documentation will be provided only to individuals requesting them for scientific and research purposes, with a commitment to maintaining confidentiality and ethical use of the information. Eligible individuals may include: - Researchers employed at universities or research institutions - Graduate students working on topics related to the study - Independent researchers with credible and relevant projects - Individuals in related industries requiring data for scientific and practical development Access to the data is subject to a written request and approval by the ethics committee or study authorities. Recipients are also required to comply with data protection and participant confidentiality regulations.
Under which criteria data/document could be used
Conditions for the Use of Anonymized Data and Documentation: Anonymized data and documentation will be provided to ensure the privacy and confidentiality of participants. Use of these data is permitted solely for scientific and research purposes, including statistical analyses, meta-analyses, trend evaluations, and scientific comparisons. Commercial use, unauthorized copying, or dissemination of data without written permission is strictly prohibited. **Governing Mechanisms for Use:** - Recipients must adhere to research ethics principles and maintain confidentiality. - Data may only be used for the purposes specified in the request. - Any publication of results must acknowledge the source and obtain approval from the principal investigator. - Any use beyond the stated purposes requires renewed approval from the ethics committee.

Conditions and Criteria for Submitting a Request: To obtain data and documentation, applicants must: - Submit a written request specifying the exact research or application purpose of the data. - Provide a research CV or relevant credentials to verify scientific qualification. - Sign a confidentiality and research ethics commitment. - Agree to use the data solely for the stated purposes and not transfer it to unauthorized individuals or entities. - Obtain approval from the ethics committee or study authorities if required.

From where data/document is obtainable

Guidelines for Requesting Study Data and Documentation: To request de-identified study data and documentation, please follow the steps below in order of priority: Contact the lead researcher: First, contact the lead researcher or principal investigator of the study. Their contact information is usually provided in the introduction or abstract. Submit a formal written request: Send your request in writing (email or formal letter) to the lead researcher along with the precise research objective, resume, and ethical commitment letter. Contact the Institutional Ethics Committee: If you need ethical approval, contact the ethics committee of the university or related institution. Receive data after approval: After the request is approved and the confidentiality commitment letter is signed, the desired data and documentation will be delivered to you. Contact information: Name of lead researcher: Dr. Amir Fallahnejad Mojard. Email: amirfalh.sport@gmail.com Phone: 09912436164 Office address: Amin University of Law Enforcement Sciences.

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

Process for Obtaining Documentation and Data and Related Details: 1. **Request Submission and Review:** Upon submission of a written request including the research purpose, supporting documents, and an ethical commitment letter, the request will be reviewed by the responsible researcher and, if necessary, the ethics committee. This stage typically takes 7 to 14 business days. 2. **Request Approval and Ethical Agreement:** After verification of qualifications and ethical considerations, the applicant must sign a confidentiality and research ethics commitment letter. This may be done electronically or in person and usually takes 1 to 3 business days. 3. **Data Preparation and Analysis:** Anonymized data and documentation will be prepared based on the request. If specific data processing or extraction is required, this stage may take 3 to 7 business days. 4. **Data Delivery:** Once prepared, the data will be delivered as electronic files (e.g., Excel, SPSS, PDF) via secure email or a secure data-sharing platform. 5. **Support and Clarifications:** After data delivery, the responsible researcher will be available to provide guidance or address any questions. **Estimated Total Time:** The entire process, from request submission to data delivery, typically takes 2 to 4 weeks, depending on the data volume and processing complexity.

Comments