Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparing the Effects of Three Training Models (Plyometric, Traditional, and Combined) on Skill Control and Motor Performance in Professional Male Volleyball Players

Protocol summary

Study aim

Comparing the effects of three training models (plyometric, traditional, and combined) on skill control (spike and block speed and accuracy) and motor performance (sprint speed, agility, explosive power, and balance) in professional male volleyball players aged 18-30 years.

Design

Randomized controlled trial, single-blind (outcome assessors), parallel three-intervention-group, pre-test/post-test, sample size 45, software randomization, phase not applicable.

Settings and conduct

Tarbiat Modares University. After screening and consent, 8-week intervention in standard hall under expert trainer supervision. Assessments by blinded assessors at pre-test and post-test.

Participants/Inclusion and exclusion criteria

Inclusion: male volleyball players 18-30 years; at least 3 years of league experience; no musculoskeletal injury in last 6 months; no performance-affecting medications; no chronic disease; consent. Exclusion: history of severe knee, ankle, or back injury; uncontrolled heart disease or diabetes; anti-inflammatory or steroidal medication use; inability to balance for 30s; history of lower limb or spinal surgery.

Intervention groups

Plyometric group: 8 weeks, 3×45min/week, explosive exercises including box jumps, tuck jumps, split squat jumps, lateral zigzag hops, and drop jumps. Traditional group: 8 weeks, 3×45min/week, resistance and aerobic exercises including steady running, squats, lunges, and abdominal exercises. Combined group: 8 weeks, 3×45min/week, combining 20 min plyometric and 20 min traditional training.

Main outcome variables

Skill control (spike and block speed and accuracy using digital timer and accuracy recording); motor performance (20-m sprint speed using timer; agility using T-test; explosive power using vertical jump; balance using single-leg stance with eyes closed).

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20260624069940N3**
Registration date: **2026-07-25, 1405/05/03**
Registration timing: **prospective**

Last update: **2026-07-25, 1405/05/03**
Update count: **0**

Registration date

2026-07-25, 1405/05/03

Registrant information

Name

Atiye Gholizadeh

Name of organization / entity

Tarbiat modares university

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Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-08-06, 1405/05/15

Expected recruitment end date

2026-10-07, 1405/07/15

Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Comparing the Effects of Three Training Models (Plyometric, Traditional, and Combined) on Skill Control and Motor Performance in Professional Male Volleyball Players

Public title
Comparison of Three Training Methods on Skill and Motor Performance in Professional Volleyball Players
Purpose
Other
Inclusion/Exclusion criteria
Inclusion criteria:
Male volleyball players aged 18 to 30 years At least 3 years of regular team training experience in Division One or Two league No musculoskeletal injuries in the past 6 months No use of performance-affecting medications No chronic diseases Ability to understand and cooperate in performing tests and exercises Signed written informed consent to participate in the study
Exclusion criteria:
History of severe knee, ankle, or back injury in the past 6 months Uncontrolled cardiovascular diseases Uncontrolled diabetes Regular use of anti-inflammatory or steroidal medications Inability to maintain standing balance for at least 30 seconds without assistance History of lower limb or spinal surgery in the past year
Age
From **18 years** old to **30 years** old
Gender
Male

Phase
N/A
Groups that have been masked

- Outcome assessor

Sample size
Target sample size: **45**
Randomization (investigator's opinion)
Randomized
Randomization description
After initial screening and confirmation of eligibility, eligible participants will be randomly assigned to three intervention groups (Plyometric, Traditional, and Combined) using randomization software. The randomization method is simple randomization with individual as the unit of randomization. No stratification is used. The random sequence is generated by software. Allocation concealment is ensured using sealed envelopes.
Blinding (investigator's opinion)
Single blinded
Blinding description
In this study, due to the nature of the exercise intervention, complete blinding is not possible. However, outcome assessors who are responsible for administering the skill-related tests (spike and block speed and accuracy) and motor tests (sprint speed, agility, explosive power, and balance) will be blinded to participants' group allocation. Participants, the principal investigator, and trainers are aware of the intervention type. Outcome assessors are blinded through participant coding and lack of access to group allocation information.
Placebo
Not used
Assignment
Parallel
Other design features
Randomized controlled trial, single-blind (outcome assessors), with three parallel groups and pre-test/post-test design

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Research Ethics Committee of Tarbiat Modares University
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Tarbiat Modares University, Shahid Chamran Blvd., Tehran, Iran
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Approval date
2026-05-25, 1405/03/04
Ethics committee reference number
IR.MODARES.REC.1405.042

Health conditions studied

1

Description of health condition studied
Sports performance evaluation
ICD-10 code
Z02.5
ICD-10 code description
Examination for participation in sport

Primary outcomes

1

Description
Spike Execution Speed
Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Recording the execution time of the spike movement using a digital timer from the start of the movement to the moment of hand contact with the ball; each test is repeated three times and the best time is recorded as the final score

2

Description

Spike Accuracy

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Hitting the ball toward designated targets on the floor; recording the number of accurate hits within the target area out of 10 attempts; each test is repeated three times and the best result is recorded

3

Description

Block Execution Speed

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Recording the execution time of the block movement using a digital timer from the start of the movement to the moment the hands reach the highest point; each test is repeated three times and the best time is recorded as the final score

4

Description

Block Accuracy

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Recording the number of times the player positions correctly and with proper timing relative to the opponent's attack; out of 10 attempts, the number of successful blocks is recorded

5

Description

20-Meter Sprint Speed

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Recording the time to cover 20 meters using a digital timer; each test is repeated three times and the best time is recorded as the final score

6

Description

Agility

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

T-Test; recording the time to complete the designated course with rapid directional changes using a digital timer; each test is repeated three times and the best time is recorded as the final score

7

Description

Lower Limb Explosive Power

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Standing vertical jump (Sargent jump); recording jump height using a tape measure mounted on the wall or a contact mat device; each test is repeated three times and the highest jump is recorded

8

Description

Balance

Timepoint

Before the intervention and after 8 weeks of intervention

Method of measurement

Single-leg stance test with eyes closed; recording the duration of balance maintenance in seconds using a stopwatch; each test is repeated three times and the longest time is recorded

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group 1 (Plyometric): Plyometric training for 8 weeks, three sessions per week, each session lasting 45 minutes. Each session includes 10 minutes of warm-up with light running and dynamic stretching, 30 minutes of specialized volleyball plyometric exercises including box jumps (3 sets of 8 reps), tuck jumps (3 sets of 10 reps), split squat jumps (3 sets of 10 reps per leg), lateral zigzag hops (3 sets of 15 reps), and drop jumps (3 sets of 8 reps) with gradual progressive overload, and 5 minutes of cool-down with static stretching. Rest between sets is 30-60 seconds and between exercises 2 minutes.

Category

Behavior

2

Description

Intervention group 2 (Traditional): Traditional resistance and aerobic training for 8 weeks, three sessions per week, each session lasting 45 minutes. Each session includes 10 minutes of warm-up with light running and dynamic stretching, 30 minutes of resistance and aerobic exercises including steady running (3 sets of 200 meters), squats without jump (3 sets of 12 reps), lunges without jump (3 sets of 10 reps per leg), and crunch and

abdominal exercises (3 sets of 15 reps) with gradual progressive overload, and 5 minutes of cool-down with static stretching. Rest between sets is 30-60 seconds and between exercises 2 minutes.

Category

Behavior

3

Description

Intervention group 3 (Combined): Combined training (plyometric and traditional) for 8 weeks, three sessions per week, each session lasting 45 minutes. Each session includes 10 minutes of warm-up with light running and dynamic stretching, 30 minutes of combined training including 20 minutes of plyometric exercises (box jumps, tuck jumps, split squat jumps, lateral zigzag hops, and drop jumps) and 20 minutes of traditional exercises (steady running, squats without jump, lunges without jump, and abdominal exercises) with gradual progressive overload, and 5 minutes of cool-down with static stretching. Rest between sets is 30-60 seconds and between exercises 2 minutes.

Category

Behavior

Recruitment centers

1

Recruitment center

Name of recruitment center
Tarbiat Modares University

Full name of responsible person
Zolfaghar Hamid Abdollah Albarmani

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Sponsors / Funding sources

1

Sponsor

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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
Tarbiat Modares 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
Tarbiat Modares University

Full name of responsible person
Zolfaghar Hamid Abdollah Albarmani

Position
PhD Candidate in Exercise Physiology

Latest degree
Master

Other areas of specialty/work
Exercise Physiology

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Person responsible for scientific inquiries

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Other areas of specialty/work
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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
Yes - There is a plan to make this available

Clinical Study Report
Yes - There is a plan to make this available

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
All collected data related to skill variables (spike and block speed and accuracy) and motor variables (sprint speed, agility, explosive power, and balance) will be shared completely without identifying information. Documentation regarding methodology, forms used, and analysis plan will also be provided.

When the data will become available and for how long
Six months after publication of study results

To whom data/document is available
Researchers affiliated with reputable academic and scientific institutions who have an approved research proposal by their institutional ethics committee.

Under which criteria data/document could be used
Data may be used solely for research purposes and secondary analyses related to exercise physiology and sports performance. Commercial use of the data is not permitted. All users must adhere to ethical requirements and maintain data confidentiality, and must report any findings from their analyses to the primary authors. Requests must include a detailed description of the project and its objectives.

From where data/document is obtainable
To request data, please contact the corresponding author, Mr. Zolfaghar Hamid Abdollah Albarmani, via email at d.albarmani@modares.ac.ir. Requests may also be submitted through the Department of Exercise Sciences at Tarbiat Modares University.

What processes are involved for a request to access data/document
Upon submission of a request via email, the corresponding author will review the application. After approval by the university ethics committee, the request will be forwarded to the research team. If finally approved, de-identified data will be provided within two to four weeks via email or a secure data-sharing platform.

Comments
Data will be provided solely for non-commercial purposes, with full adherence to ethical principles and confidentiality of participant information.