Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Effects of fetigue on reaction time and Electromyographie activity in martial artists

Protocol summary

Study aim

This study aims to investigate the effect of fatigue on reaction time and the electromyographic activity of selected muscles in martial artists with a history of ACL injury, and to evaluate changes in these variables before and after a fatigue protocol.

Design

This study is a quasi-experimental one-group pretest–posttest study conducted on 20 eligible martial artists. The fatigue protocol is applied as the intervention, and each participant serves as their own control; therefore, no randomization will be performed.

Settings and conduct

This study is a single-blind pretest–posttest study conducted at the laboratory of Arak University. Selected reaction time will be assessed before and after the fatigue protocol using visual stimuli, and the electromyographic (EMG) activity of four selected lower-limb muscles will be recorded and analyzed before and after the fatigue protocol.

Participants/Inclusion and exclusion criteria

Before the study, 20 martial artists voluntarily completed an informed consent form and a medical history questionnaire, and their information was kept confidential. Inclusion criteria were a grade I ACL injury within the past 6 months and at least 3 years of regular training in Taekwondo or Karate. Exclusion criteria included concurrent knee injuries, history of ACL surgery, neurological disorders, and use of medications affecting neuromuscular function.

Intervention groups

In this study, a group of 20 participants was evaluated. All participants were assessed under both pre-fatigue and post-fatigue conditions. Accordingly, choice reaction time and the electromyographic activity of selected muscles were measured and recorded in both conditions (before and after the fatigue protocol.

Main outcome variables

The primary outcome measures were selected reaction time and the electromyographic (EMG) activity of the selected muscles before and after the fatigue protocol.

General information

Reason for update

Acronym

Effets af fetiuge on RT and EMG in MA

IRCT registration information

IRCT registration number: **IRCT20251018067670N2**
Registration date: **2026-08-13, 1405/05/22**
Registration timing: **prospective**

Last update: **2026-08-13, 1405/05/22**
Update count: **0**

Registration date

2026-08-13, 1405/05/22

Registrant information

Name

Mohammad amin Emadian

Name of organization / entity

The University

Country

Iran (Islamic Republic of)

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Email address

mohammadaminemadian@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-08-21, 1405/05/30

Expected recruitment end date

2026-09-06, 1405/06/15

Actual recruitment start date

empty

Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Effects of fetigue on reaction time and Electromyographie activity in martial artists

Public title
Effects of fetigue on reaction time and Electromyographie activity in martial artists
Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
History of a Grade I anterior cruciate ligament (ACL) injury within the past six months Participants who are martial artists
Exclusion criteria:
Concurrent injury in other knee structures History of anterior cruciate ligament (ACL) reconstruction surgery Neurological injuries and use of medications affecting neuromuscular performance
Age
From **14 years** old to **24 years** old
Gender
Male

Phase
N/A
Groups that have been masked

- Outcome assessor

Sample size
Target sample size: **20**
Randomization (investigator's opinion)
N/A
Randomization description
Blinding (investigator's opinion)
Single blinded
Blinding description
This study is a quasi-experimental study with a single-group pretest–posttest design. The fatigue protocol was considered the intervention, and each participant served as their own control. A total of 20 participants were assigned to a single group, and comparisons were made within individuals. The injured limb of each participant was compared with their contralateral uninjured limb. A single-blind design was used in this study. In this type of blinding, the outcome assessors were unaware of the participants' group allocation to minimize potential measurement bias. The assessment protocol consisted of a single group, and both selective reaction time and the electrical activity of selected muscles were evaluated during two separate testing sessions. In one session, selective reaction time was assessed before and after the fatigue protocol. In the other session, the electrical activity of the selected muscles was recorded before and after the fatigue protocol.
Placebo
Not used
Assignment
Single
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Etics committe Arak University
Street address
ایران ؛ استان مرکزی شهر اراک ، سردشت ، بلوار کربلا دانشگاه سراسری اراک
City
Arak
Province
Markazi
Postal code
3848177584
Approval date
2026-03-16, 1404/12/25
Ethics committee reference number
IR.ARAKU.REC.1404.091

Health conditions studied

1

Description of health condition studied
Type I anterior cruciate ligament injury
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Changes in reaction time and comparison of electrical activity of selected muscles in martial artists
Timepoint
start studying
Method of measurement
To assess choice reaction time, participants will be required to perform the movement technique corresponding to each specific visual stimulus presented on a display screen. In addition, the electrical activity of the selected muscles will be recorded using surface electromyography (sEMG). Muscle activity will be measured during the execution of a specific assessment task consisting of a single-leg landing from a height of 30 cm with the arms crossed over the chest.

Secondary outcomes

empty

Intervention groups

1

Description

This study aims to determine the effect of low-grade anterior cruciate ligament (ACL) injury on reaction time and the electrical activity of selected knee-stabilizing muscles, with the ultimate goal of increasing athletes' awareness of the importance of low-grade ACL injuries.Intervention Group:This study will employ a quasi-experimental, single-group pretest–posttest design. The intervention group will consist of 20 martial artists. Selective reaction time and the electrical activity of selected muscles will be assessed at two time points: before and after the implementation of the fatigue protocol.Control Condition:Since this study uses a single-group design, there will be no separate control group. Instead, the uninjured limb of each participant will serve as the internal control and will be compared with the injured limb. This within-subject comparison will allow the researchers to examine differences between the injured and healthy limbs under the same experimental conditions.Each participant will undergo two separate assessment sessions within one month. In one session, selective reaction time will be assessed before and after the fatigue protocol. In a separate session, the electrical activity of the selected muscles will be recorded before and after the fatigue protocol.Selective reaction time will be evaluated using visual stimuli presented on a computer monitor. The electrical activity of the selected muscles will be assessed using surface electromyography (sEMG).Therefore, the assessment protocol will consist of two separate testing days. On the first day, selective reaction time will be measured before and after fatigue. On the second day, the electrical activity of the selected muscles will be recorded before and after fatigue.

Category

Prevention

Recruitment centers

1

Recruitment center

Name of recruitment center
Fateh taekwondo club
Full name of responsible person
mohammad amin emadian
Street address
sport complex 5 mordad
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اراك
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38166765559
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Fateh taekwondo club
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Street address
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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
Fateh taekwondo club

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
Other

Person responsible for general inquiries

Contact

Name of organization / entity
Arak university
Full name of responsible person
mohammad amin emadian
Position
Bachelor
Latest degree
Bachelor
Other areas of specialty/work
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Person responsible for scientific inquiries

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arak university

Full name of responsible person

mohammad amin emadian

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bachelor

Latest degree

Bachelor

Other areas of specialty/work

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Person responsible for updating data

Contact

Name of organization / entity

arak univercity

Full name of responsible person

mohammad amin emadian

Position

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Latest degree

Bachelor

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

Yes - There is 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

Only a portion of the data, such as information related to the primary outcome variables of the study, will be shared.

When the data will become available and for how long

Access will begin after the completion of the study.

To whom data/document is available

Individuals working in academic and sports institutions will be included.

Under which criteria data/document could be used

Only data that have been collected and used within the study will be available for use.

From where data/document is obtainable

Sent to the researcher’s email.

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

The email will be sent, and responses will be provided within one month thereafter.

Comments