Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Evaluation and Comparison of the Effects of Low-Level Laser Therapy at 810 nm and 660 nm in Reducing Pain After Root Canal Treatment of Maxillary and Mandibular Premolar and Molar Teeth with Irreversible Pulpitis and Apical Periodontitis

Protocol summary

Study aim
Evaluation and Comparison of the Effects of Low-Level Laser Therapy at 810 nm and 660 nm in Reducing Pain After Root Canal Treatment of Maxillary and Mandibular Premolar and Molar Teeth with Irreversible Pulpitis and Apical Periodontitis

Design
This randomized clinical trial is a double-blinded study with a parallel design. This randomized study will be conducted on 28 eligible patients. A simple randomization method will be used for randomization, and participants will be assigned to two intervention groups.

Settings and conduct
This study, which will be conducted at the Faculty of Dentistry, Khorasgan Azad University, is a double-blind study. In this double-blind study, patients are aware of their participation in the study, but the researcher and participants are unaware of the type of laser. In this study, gender, difficulty of root canal treatment, and type of teeth in the lower jaw will be matched, and the type of canal cleaning materials will be the same.

Participants/Inclusion and exclusion criteria
Inclusion criteria: Informed consent; People with symptomatic apical periodontitis in mandibular and maxillary premolars and molars; Symptomatic irreversible pulpitis; Pain score above 54 before the start of the study Exclusion criteria: Taking painkillers 48 hours before treatment; Patients presenting for secondary or repeat treatment; People with a history of seizures

Intervention groups
In the first intervention group, patients will receive a low-power laser with a wavelength of 810 nm in addition to standard endodontic treatment. In the second intervention group, patients will receive a low-power laser with a wavelength of 660 nm in addition to standard endodontic treatment.

Main outcome variables
Pain level

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20130812014333N266**
Registration date: **2025-09-30, 1404/07/08**
Registration timing: **prospective**

Last update: **2025-09-30, 1404/07/08**
Update count: **0**

Registration date
2025-09-30, 1404/07/08

Registrant information

Name
Feizollah Foroughi

Name of organization / entity
kermanshah University of Medical Sciences

Country
Iran (Islamic Republic of)

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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2025-10-12, 1404/07/20

Expected recruitment end date
2025-12-11, 1404/09/20
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Evaluation and Comparison of the Effects of Low-Level Laser Therapy at 810 nm and 660 nm in Reducing Pain After Root Canal Treatment of Maxillary and Mandibular Premolar and Molar Teeth with Irreversible Pulpitis and Apical Periodontitis

Public title
Comparison of the Effects of Low-Level Laser Therapy at 810 nm and 660 nm in Reducing Pain
Purpose
Treatment
Inclusion/Exclusion criteria
Inclusion criteria:
Informed consent People with symptomatic apical periodontitis in mandibular and maxillary premolars and molars Symptomatic irreversible pulpitis Pain score above 54 before the start of the study
Exclusion criteria:
Taking painkillers 48 hours before treatment Pregnant or breastfeeding women Patients presenting for secondary or repeat treatment People with a history of seizures
Age
No age limit
Gender
Both

Phase
N/A
Groups that have been masked

- Participant
- Investigator

Sample size
Target sample size: **28**
Randomization (investigator's opinion)
Randomized
Randomization description
Simple random method. 28 cards are selected and numbers from 1-28 are inserted on the cards. The cards are placed in an envelope. Two of the design partners take one card out of the envelope each time and announce the card number. Paired numbers are assigned to the intervention group and odd numbers to the control group
Blinding (investigator's opinion)
Double blinded
Blinding description
In this double-blind study, patients are aware of their participation in the study, but the researcher and participants are unaware of the type of laser. To maintain the two -blind conditions, the laser devices used in appearance and function sound were fully similar to that patients could not detect the type of laser. Disclosure tags and symptoms were hidden on the devices, and each device's settings were made by a technique that was neither associated with patients nor involved in evaluating the results.
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics Committee of Islamic Azad University, Khorasgan branch
Street address
Vice Chancellor for Research Affairs, University Blvd., Arghwanieh, J Sharghi Street
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Isfahan
Province
Isfehan
Postal code
8155139998
Approval date
2025-07-07, 1404/04/16
Ethics committee reference number
IR.IAU.KHUISF.REC.1404.307

Health conditions studied

1

Description of health condition studied
Symptomatic apical periodontitis
ICD-10 code
K04.4
ICD-10 code description
Acute apical periodontitis of pulpal origin

Primary outcomes

1

Description
Pain level
Timepoint
At baseline, immediately after treatment, and at 4, 8, 12, and 24 hours after treatment
Method of measurement
Using a visual pain scale (VAS)

Secondary outcomes

empty

Intervention groups

1

Description
In the first intervention group, patients will receive a low-power laser with a wavelength of 810 nm in addition to standard endodontic treatment.
Category
Treatment - Other

2

Description
In the second intervention group, patients will receive a low-power laser with a wavelength of 660 nm in addition to standard endodontic treatment.
Category
Treatment - Other

Recruitment centers

1

Recruitment center
Name of recruitment center
Faculty of Dentistry
Full name of responsible person
Anahita Alikhani
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
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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, Khorasgan Branch
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
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Dental Student
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Person responsible for updating data

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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
There is no further information
Study Protocol
No - There is not a plan to make this available
Statistical Analysis Plan
No - There is not a plan to make this available
Informed Consent Form
No - There is not 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