Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

Investigating the effects of mobile waves on cognitive and executive functions of the brain in healthy female students

Protocol summary

Study aim
Investigating the effects of mobile waves on cognitive and executive functions of the brain

Design
Randomised crossover clinical trial which will be single blinded. 40 female students who living in the dormitory will be tested

Settings and conduct
The participants are randomly divided into two groups of 20, one group at the first session and the other in the second session are exposed to mobile waves. At the intervention session, the cell phone is placed on the head with their left ear. The call is made from the outside of the scope of the call by using the headset. To eliminate the effect of noise on the measured values, the voice plays in both sessions. The participant is unaware of the call service. After the call, the person is trained to do the tests. After about 5 to 7 minutes, the cognitive tests are performed by the participant, respectively, and the results are stored: reaction time(RT) test, stroop, stroop effect, Wisconsin Cards Sorting Test(WCST) , Time Perception Test. In the control session, the steps are the same, with the difference that the call is not established here.

Participants/Inclusion and exclusion criteria
The healthy female students who are right-handed, living in dormitoriy and have same nutrition.Their Anxiety and depression test score are respectively below 15 and 17.

Intervention groups
Individuals are divided into two groups , one group at the first session and one in the second session are exposed to mobile waves.

Main outcome variables
Minimum and Mean of RT; Mean time and the number of errors in Stroop test and Stroop effect; Mean and minimum time in time perception test; number of correct answers, number of errors(totally and divided), number of Perseverative response, number of trials to complete the first pattern, number of failures in maintain set, and number of conceptual level responses in WCST.

General information

Reason for update
Acronym
IRCT registration information
IRCT registration number: **IRCT20190107042272N1**
Registration date: **2019-05-27, 1398/03/06**
Registration timing: **retrospective**

Last update: **2019-05-27, 1398/03/06**
Update count: **0**

Registration date
2019-05-27, 1398/03/06

Registrant information
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Fatemeh Heiydari
Name of organization / entity
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Iran (Islamic Republic of)
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Recruitment status
Recruitment complete
Funding source

Expected recruitment start date
2018-04-07, 1397/01/18
Expected recruitment end date
2018-04-20, 1397/01/31
Actual recruitment start date
2018-04-20, 1397/01/31
Actual recruitment end date
2018-04-20, 1397/01/31
Trial completion date

2018-06-03, 1397/03/13

Scientific title
Investigating the effects of mobile waves on cognitive and executive functions of the brain in healthy female students

Public title
Investigating the effects of mobile waves on cognitive and executive functions of the brain

Purpose
Education/Guidance

Inclusion/Exclusion criteria

Inclusion criteria:
People who are right-handed. People living in dormitories who have the same nutrition.

Exclusion criteria:
Anxiety test score of Beck anxiety inventory more than 15. Depression test score from Beck Depression Inventory more than 17.

Age
No age limit

Gender
Female

Phase
N/A

Groups that have been masked

- Participant

Sample size
Target sample size: **40**
Actual sample size reached: **40**

Randomization (investigator's opinion)
Randomized

Randomization description
Participants are dividing into two groups by simple randomization method and using statistical software. The first group is exposed to mobile waves in the first session and the second group exposure is in the second session.

Blinding (investigator's opinion)
Single blinded

Blinding description
Participants are unaware of in which session they are being exposed to mobile waves

Placebo
Used

Assignment
Crossover

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Ethics Committee in Biomedical Research of Qom University of Medical Sciences

Street address
No. 83, Alley No. 4, Alley No. 1/1, Safashahr Ave

City
Qom

Province
Ghoum

Postal code
37/69-87366

Approval date
2017-08-01, 1396/05/10

Ethics committee reference number
IR.MUQ.REC.1396.52

Health conditions studied

1

Description of health condition studied
The effects of mobile waves on cognitive and executive functions of the brain

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description
Minimum of Reaction Time

Timepoint
After 5 to 7 minutes from the arrival of the person to the test site in two sessions without exposed and exposed to mobile waves

Method of measurement
Reaction Time Test

2

Description
Average reaction time

Timepoint
After 5 to 7 minutes from the arrival of the person to the test site in two sessions without exposed and exposed to mobile waves

Method of measurement
Reaction Time Test

3

Description
Average response time

Timepoint
Immediately after doing the Reaction Time test in two sessions without exposed and exposed to mobile waves

Method of measurement
Stroop Test

4

Description
Number of errors

Timepoint

Immediately after doing the Reaction Time test in two sessions without exposed and exposed to mobile waves

Method of measurement

Stroop Test

5

Description

Average response time

Timepoint

Immediately after doing the Stroop test in two sessions without exposed and exposed to mobile waves

Method of measurement

Stroop effect test

6

Description

Number of errors

Timepoint

Immediately after doing the Stroop test in two sessions without exposed and exposed to mobile waves

Method of measurement

Stroop effect test

7

Description

Average response time

Timepoint

Immediately after doing the Wisconsin Card Sorting test in two sessions without exposed and exposed to mobile waves

Method of measurement

Time perception test

8

Description

Minimum of response time

Timepoint

Immediately after doing the Wisconsin Card Sorting test in two sessions without exposed and exposed to mobile waves

Method of measurement

Time perception test

9

Description

Number of Correct responses

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

10

Description

Number of Errors

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

11

Description

Number of Perseverative response

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

12

Description

Number of Perseverative errors

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

13

Description

Number of Non-Perseverative errors

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

14

Description

Number of Unique Errors

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

15

Description

Number trials to complete the first pattern

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

16

Description

Number of Failure to maintain set

Timepoint

Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves

Method of measurement

Wisconsin card sorting test

17

Description
Number of conceptual level responses
Timepoint
Immediately after doing the Stroop Effect test in two sessions without exposed and exposed to mobile waves
Method of measurement
Wisconsin card sorting test

Secondary outcomes

empty

Intervention groups

1

Description
First intervention group: At the first session (intervention), people sit on a chair and the cell phone is placed on the head with their left ear. The call is made from the outside of the scope of the call by using the headset.To eliminate the effect of noise on the measured values, the silencer used and voice also plays in both sessions. It should be noted that, the participant is unaware of the call service. After the call, the person is trained to do the tests. After about 5 to 7 minutes, the cognitive tests are performed by the participant, respectively, and the results are stored. During the second session (control), all Interventions are seemed to be performed, but exposure to mobile waves is not taking place.
Category
Placebo

2

Description
Second intervention group: In the first session (control), all interventions are apparently performed, but exposure to mobile waves is not performed. At the second session (exposure), after the visit, people sit on a chair and the mobile phone is placed on the head with their left ear. To eliminate the effect of noise on the measured values, the silencer is used and voice also plays in this session. After the call, the person is trained to do the tests. After about 5 to 7 minutes, the cognitive tests are performed by the participant, respectively, and the results are stored.
Category
Placebo

Recruitment centers

1

Recruitment center
Name of recruitment center
Kowsar Dormitory of Qom University of Medical Sciences
Full name of responsible person
Student Deputy of Qom University of Medical Sciences
Street address
Campus of Qom University of Medical Sciences, opposite Yadgar Imam Stadium, Al Ghadir Blvd
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Province
Ghoum
Postal code
3736175513
Phone
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Email
daneshjooei-csa@muq.ac.ir

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Ghoum University of Medical Sciences
Full name of responsible person
Deputy of Research and Technology of Qom University of Medical Sciences
Street address
No. 83, Alley No. 4, Alley No.1/1, Safashahr Ave
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Qom
Province
Ghoum
Postal code
37/69-87366
Phone
+98 25 3285 4011
Fax
+98 25 3285 8855
Email
pajoohesh-pezeshki@muq.ac.ir
Web page address
http://res.muq.ac.ir/index.aspx
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Ghoum University of Medical Sciences
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
Ghoum University of Medical Sciences
Full name of responsible person
Fatemeh Heiydari
Position
Medical Student
Latest degree
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Other areas of specialty/work
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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
No more information exists.
Study Protocol
Yes - There is a plan to make this available
Statistical Analysis Plan
Not applicable
Informed Consent Form
No - There is not a plan to make this available
Clinical Study Report
Yes - There is a plan to make this available
Analytic Code
Not applicable
Data Dictionary
Not applicable
Title and more details about the data/document
The results of data analysis and related to the main implications are shared
When the data will become available and for how long
After the publication of the article
To whom data/document is available
All researchers
Under which criteria data/document could be used
All researchers should be allowed to do any analyzes and Terms and conditions to be notified
From where data/document is obtainable
Fatemeh Heiydari Email: fatemeh.heiydari@gmail.com
What processes are involved for a request to access data/document
After reviewing the request, he will be notified by email
Comments