

Clinical Trial Protocol

Iranian Registry of Clinical Trials

16 Sep 2026

Developing and Evaluating of Executive Function and Premath Skills Training Programs for Preschool Children at Risk of Mathematical Difficulties

Protocol summary

Summary

Executive function skills are important predictors of children's success in academic learning especially mathematics achievement. Research also has shown that children's performance in mathematics is effected by pre-math skills they brought with themselves to the school. This randomized controlled trial is designed to examine the effects of executive function and pre-math skills training on the mathematics and cognitive functioning of preschool children at risk for mathematical difficulties. Participants will be randomly assigned to the control group or one of the three experimental groups including a) executive function training, b) pre-math training and c) combination of the both executive function and pre-math training. We will evaluate math achievement and executive function skills of the participants before and just after the intervention, and at a 4-month follow up. The intervention curriculum include 24 sessions five per week for 20 to 25 minutes per session. The data will be analyzed using descriptive statistics and repeated measure analysis using SPSS version 16.

General information

Acronym

Math Achievement

IRCT registration information

IRCT registration number: **IRCT2016042717134N3**

Registration date: **2017-03-05, 1395/12/15**

Registration timing: **retrospective**

Last update:

Update count: **0**

Registration date

2017-03-05, 1395/12/15

Registrant information

Name

Ahmad Ahmadi

Name of organization / entity

University of Tehran

Country

Iran (Islamic Republic of)

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Email address

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Recruitment status

Recruitment complete

Funding source

University of Tehran

Expected recruitment start date

2016-01-21, 1394/11/01

Expected recruitment end date

2016-08-05, 1395/05/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Developing and Evaluating of Executive Function and Premath Skills Training Programs for Preschool Children at Risk of Mathematical Difficulties

Public title

Evaluation of the Effectiveness of Pre-math Training and Executive Function

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria: subjects with low performance in

mathematics, parent's willingness to participate in research; lack of mental retardation or any other physical disabilities; having listening and speaking ability and they ranged in age from 5.5 to 6.5 years old. Exclusion criteria: participants, who are not eligible for the above, plus be under another intervention similar to the research intervention, if any, will be exclude.

Age

From **5 years** old to **6 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **160**

Randomization (investigator's opinion)

Randomized

Randomization description**Blinding (investigator's opinion)**

Double blinded

Blinding description**Placebo**

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Faculty of Psychology & Education

Street address

chamran Highway, Jalale Ale Ahmad Ave, Faculty of Psychology & Education

City

Tehran

Postal code

1445983861

Approval date

2015-07-12, 1394/04/21

Ethics committee reference number

IR.UT.REC.1395.001

Health conditions studied**1****Description of health condition studied**

Learning disability

ICD-10 code

F81.2

ICD-10 code description

Specific disorder of arithmetical skills

Primary outcomes**1****Description**

Math skills

Timepoint

Baseline, post-treatment, 4 months after intervention

Method of measurement

Total Score on the Repeatable Battery for the Assessment of Math Achievement

2**Description**

Executive Functions Skills

Timepoint

Baseline, post-treatment, 4 months after intervention

Method of measurement

Tower of London, Behavior Rating Inventory of Executive Function, ,Stanford-Binet Intelligence Scales

Secondary outcomes**1****Description**

Working Memory Skills

Timepoint

Baseline, post-treatment, 4 months after intervention

Method of measurement

Working Memory Index of Stanford-Binet Intelligence Scales

2**Description**

Inhibition Skills

Timepoint

Baseline, post-treatment, 4 months after intervention

Method of measurement

Stroop test

Intervention groups**1****Description**

Participants of intervention group will receive three different arms of intervention including: Arms one: Subjects will undergo the Maghzine, computerized executive functioning training with game elements, for 24 sessions over the span of 6 weeks. Each session will take 30-minute to complete. In addition to the Maghzine, the intervention group will play cognitive training games aimed at increasing working memory and inhibition skills.

Category

Prevention

2

Description

Arms two: The intervention activities mainly were selected from three evidence based math curriculum. Lessons addressed teaching of shapes, space, algebraic thinking, geometry, counting, measurement, comparison, classifying and basics operations with worksheet, manipulative and computer-based activities matched with the designed curriculum. The intervention program included twenty-four sessions of math instruction carried out every day, five days a week in small-group formats.

Category

Prevention

3

Description

Arms three: combination of pre-math training and executive function training

Category

Prevention

4

Description

Control group: will attend the routine preschool education including basic math training, art, music and English language.

Category

Prevention

Recruitment centers

1

Recruitment center

Name of recruitment center

Parsa school and preschool center

Full name of responsible person

Street address

City

Tehran

2

Recruitment center

Name of recruitment center

Mohammad Bagher Sadr school and preschool center

Full name of responsible person

Street address

City

Tehran

3

Recruitment center

Name of recruitment center

Parsa kindergarten

Full name of responsible person

Street address

City

Tehran

4

Recruitment center

Name of recruitment center

Varesan Noor school and preschool center

Full name of responsible person

Street address

City

Tehran

5

Recruitment center

Name of recruitment center

Health Center, Tehran Municipality region two

Full name of responsible person

Street address

City

Tehran

6

Recruitment center

Name of recruitment center

Shahid Rajaie school and preschool center

Full name of responsible person

Street address

City

Tehran

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

university of Tehran

Full name of responsible person

Dr Hadi Bahrami

Street address

Faculty of Psychology & Education, University of Tehran, Jalale Ale Ahmad Ave, Tehran, Iran.

City

Tehran

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?

Yes

Title of funding source

university of Tehran

Proportion provided by this source

100

Public or private sector

empty

Domestic or foreign origin

empty

Category of foreign source of funding

empty

Country of origin

Type of organization providing the funding

empty

Person responsible for general inquiries

Contact

Name of organization / entity

University of Tehran

Full name of responsible person

Ahmad Ahmadi

Position

researcher/ PhD

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Position

Professor

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

empty

Study Protocol

empty

Statistical Analysis Plan

empty

Informed Consent Form

empty

Clinical Study Report

empty

Analytic Code

empty

Data Dictionary

empty