

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### Evaluation of the effects of 4 weeks exercise with flexible-bar on thoracic kyphosis angle and maximum voluntary contraction of thoracic muscles in postural hyperkyphosis people (18 -35 years old) with and without forward head posture

#### Protocol summary

##### Study aim

Evaluation of the effect of flexible-bar exercise on kyphosis angle and maximum voluntary contraction of thoracic muscles in postural hyperkyphosis people with and without forward head posture after 4 weeks treatment session

##### Design

Randomized trial with control and intervention groups, single blinded on 24 postural hyperkyphosis subjects

##### Settings and conduct

Twenty subjects with hyperkyphosis and with and without forward head posture will divide random in two groups according to the inclusion and exclusion criteria. The subjects in intervention group will exercise 4 weeks and The control group receives no exercise . The kyphosis angle, the craniovertebral angle, quality of life, thoracic pain and the maximum voluntary contraction in :back extensor,neck extensor ,lower and upper trapezius and levator scapulae muscles will measured befor and after 4 weeks as Pre and post test.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Men and women between 18 to 35 years old Having pain less than 3 in thoracic level with numeric pain rating scale(NRS) Having hyperkyphosis angle more than 46 and less than 60 degree Having craniovertebral angle less than 50 degree Exclusion criteria: Having body mass index more than 25 Having kyphosis with bone ,metabolic reason for example tuberculosis and large breast in women Losing any of inclusion criteria Having history of spinal surgery,infection,fracture,rheumatism pregnancy History of professional exercise in upper trunk and shoulder Scoliosis Having respiration and heart problem

##### Intervention groups

Applying flexible-bar exercise in intervention group and no intervention in control group

#### Main outcome variables

Kyphosis angle,craniovertebral angle, maximum voluntary contraction,quality of life, thoracic pain

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20090203001637N11**

Registration date: **2021-03-01, 1399/12/11**

Registration timing: **prospective**

Last update: **2021-03-01, 1399/12/11**

Update count: **0**

##### Registration date

2021-03-01, 1399/12/11

##### Registrant information

##### Name

Sedighe Kahrizi

##### Name of organization / entity

Tarbiat Modares University

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 8288 4511

##### Email address

kahrizis@modares.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2021-04-19, 1400/01/30

##### Expected recruitment end date

2021-09-22, 1400/06/31

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

Evaluation of the effects of 4 weeks exercise with flexible-bar on thoracic kyphosis angle and maximum voluntary contraction of thoracic muscles in postural hyperkyphosis people (18 -35 years old) with and without forward head posture

**Public title**

Evaluation of the effects of exercise with flexible-bar on thoracic kyphosis angle in young people (18 -35 years old)

**Purpose**

Supportive

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Men and women between 18 to 35 years old Having at least high school diploma education Having pain less than 3 in thoracic level with Numeric Pain Rating Scale(NRS) Having hyperkyphosis angle more than 46 and less than 60 degree Having cranio-vertebral angle less than 50 degree

**Exclusion criteria:**

Having body mass index more than 25 Having history of spinal surgery, infection, fracture, rheumatism Pregnancy History of professional exercise in upper trunk and shoulder Scoliosis Having respiration and heart problem having Kyphosis with other reasons for example structure deformity, metabolic tuberculosis, and having large breast in women

**Age**

From **18 years** old to **35 years** old

**Gender**

Both

**Phase**

N/A

**Groups that have been masked**

- Participant

**Sample size**

Target sample size: **24**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

Randomization method is performed by randomize table numbers, with due attention to sample size that is 24 people, are given one two digit code to each subject and researcher start by chance from one point of table to selection of subjects and do this work with closed eyes and put finger or pen nib on the table and select the numbers in the direction of row or column and do this work til the end of sample size and thus subjects stay on two intervention and control group by chance

**Blinding (investigator's opinion)**

Single blinded

**Blinding description**

Participant subjects are blinded to the kind of the group that they stay on it (intervention and control). Thus subjects of two groups have no meet and assessments are done separately in even and odd days

**Placebo**

Not used

**Assignment**

Parallel

**Other design features**

Intervention group subjects will exercise with flexible bar and control group subjects will not have any exercise

**Secondary Ids**

empty

**Ethics committees**

1

**Ethics committee**

**Name of ethics committee**

Ethics committee of Tarbiat Modares University

**Street address**

Tarbiat Modares University, Nasr bridge, Jalal e al e ahmad street, Tehran

**City**

Tehran

**Province**

Tehran

**Postal code**

1411713116

**Approval date**

2020-12-15, 1399/09/25

**Ethics committee reference number**

IR.MODARES.REC.1399.140

**Health conditions studied**

1

**Description of health condition studied**

Subjects with Postural hyper kyphosis

**ICD-10 code**

M40.0

**ICD-10 code description**

Postural kyphosis

**Primary outcomes**

1

**Description**

Kyphosis angle

**Timepoint**

Before first exercise session and 24 hours post of last exercise session

**Method of measurement**

Flexicurve ruler

## 2

### **Description**

Craniovertebral(CVA) angle

### **Timepoint**

Before first exercise session and 24 hours post of last exercise session

### **Method of measurement**

Goniometer

## 3

### **Description**

Maximum Voluntary Contraction(MVC) of back extensor, lower trapezius, upper trapezius, neck extensor, levator scapulae muscles

### **Timepoint**

Before first exercise session and 24 hours post of last exercise session

### **Method of measurement**

Recording with Electromyography system

## **Secondary outcomes**

## 1

### **Description**

score of the Quality of life questionnaire

### **Timepoint**

Before first exercise session and 24 hours post of last exercise session

### **Method of measurement**

Persian version of the Sf36 Questionnaire

## 2

### **Description**

Pain of the back region

### **Timepoint**

Before first exercise session and 24 hours post of last exercise session

### **Method of measurement**

Numeric Pain Rating Scale

## **Intervention groups**

## 1

### **Description**

Intervention group: exercise with flexible-bar 6 days in 4 weeks (24 session) and 3 sets in each session. number (adding one set) and time (adding 5 seconds) of doing sets increase progressively each weak. to prevent from fatigue, allocated 30 seconds rest between each set

### **Category**

Rehabilitation

## 2

### **Description**

Control group: No intervention

### **Category**

Rehabilitation

## **Recruitment centers**

## 1

### **Recruitment center**

#### **Name of recruitment center**

Tarbiat Modares University

#### **Full name of responsible person**

Sedighe Kahrizi

#### **Street address**

Tarbiat Modares University, Jalal e ale ahmad Avenue, Kouye Nasr

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#### **Email**

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#### **Web page address**

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## **Sponsors / Funding sources**

## 1

### **Sponsor**

#### **Name of organization / entity**

Research Deputy of Tarbiat Modares University

#### **Full name of responsible person**

Dr.Yaghoub Fathollahi

#### **Street address**

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+98 21 8828 9002

#### **Email**

Res@modares.ac.ir

#### **Grant name**

#### **Grant code / Reference number**

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

Yes

#### **Title of funding source**

Research Deputy of 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**

Zohreh Vaseghi Fard

**Position**

Student of M.sc in physical therapy

**Latest degree**

Bachelor

**Other areas of specialty/work**

Physiotherapy

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**Person responsible for scientific inquiries****Contact****Name of organization / entity**

Tarbiat Modares University

**Full name of responsible person**

Sedighe Kahrizi

**Position**

Associate Professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Physiotherapy

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**Person responsible for updating data****Contact****Name of organization / entity**

Tarbiat Modares University

**Full name of responsible person**

Sedighe Kahrizi

**Position**

Associate Professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Physiotherapy

**Street address**

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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**

Not applicable

**Informed Consent Form**

Undecided - It is not yet known if there will be 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**

File of intervention program protocol and statistical analysis plan through publication of thesis and writing an article

**When the data will become available and for how long**

Starting 6 months after publication of results

**To whom data/document is available**

The research team of this study and other clinical academic researchers who are studying in favor of these patients

**Under which criteria data/document could be used**

Researchers who intend to write a meta-analysis or systematic review articles are allowed to access document

**From where data/document is obtainable**

Dr.sedighe kahrizi , Zohreh vaseghi fard  
**What processes are involved for a request to access data/document**

The request will be responded after getting the approval of university or the academic institution  
**Comments**