Clinical Trial Protocol
Iranian Registry of Clinical Trials

17 Sep 2026

The effect of blended learning in cardiac rehabilitation based on the model of knowledge, attitude, and performance on medication adherence and self-efficacy of patients undergoing coronary artery bypass graft surgery

Protocol summary

Study aim
Determining the effectiveness of the model of knowledge, attitude, and performance on medication adherence, and self-efficacy of patients after coronary artery bypass surgery

Design
A parallel-group, single-blind, randomized controlled clinical trial on 70 patients

Settings and conduct
This study will be conducted at Farshchian Cardiovascular Hospital affiliated with Hamadan University of Medical Sciences in Hamadan City. The study is one-way blind, the health care provider (nurse of the rehabilitation department), the data analyst, and the outcome assessment will not know about the division of patients into test and control groups.

Participants/Inclusion and exclusion criteria
The inclusion criteria include patients who have undergone coronary artery bypass surgery, are literate, willing to participate in the study, have an ejection fraction above 35%, have the physical ability to do an exercise test, and have access to a smartphone and the Internet; and the criteria for not admission include class III and IV insufficiency and occurrence of severe musculoskeletal problems.

Intervention groups
Intervention group: despite receiving routine cardiac rehabilitation in the hospital, patients in this group will receive 4 sessions of in-person treatment and care training based on the model of knowledge, attitude, and performance; after completing cardiac rehabilitation, they were monitored and trained through the designed application for 3 months. Control group: Patients will receive routine cardiac rehabilitation according to the current program of the rehabilitation center and will not receive any additional training.

Main outcome variables
Medication adherence; self-efficacy

General information

Reason for update
Acronym
IRCT registration information
IRCT registration number: **IRCT20230902059333N1**
Registration date: **2024-01-02, 1402/10/12**
Registration timing: **prospective**

Last update: **2024-01-02, 1402/10/12**
Update count: **0**

Registration date
2024-01-02, 1402/10/12

Registrant information
Name
Ghazal Veisi
Name of organization / entity
Country
Iran (Islamic Republic of)
Phone
+98 87 3329 1708
Email address
ghazallv98@gmail.com

Recruitment status
Recruitment complete
Funding source

Expected recruitment start date
2024-01-20, 1402/10/30
Expected recruitment end date
2024-08-20, 1403/05/30
Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of blended learning in cardiac rehabilitation based on the model of knowledge, attitude, and performance on medication adherence and self-efficacy of patients undergoing coronary artery bypass graft surgery

Public title

The effect of blended learning in cardiac rehabilitation

Purpose

Education/Guidance

Inclusion/Exclusion criteria

Inclusion criteria:

Reading and writing literacy Patients after coronary artery bypass graft Desire to participate in the study Performing coronary artery bypass graft surgery for the first time Ejection fraction above 35% Physical ability to perform exercise test Access to a smartphone Internet access

Exclusion criteria:

Heart Failure class III and IV Presence of severe musculoskeletal problems

Age

No age limit

Gender

Both

Phase

N/A

Groups that have been masked

- Care provider
- Outcome assessor
- Data analyser

Sample size

Target sample size: **70**

Randomization (investigator's opinion)

Randomized

Randomization description

First, among the patients who have undergone coronary artery bypass surgery and meet the inclusion criteria, they were selected by the available sampling method and based on the random block method in the cardiac rehabilitation group based on the knowledge, attitude, and performance model (intervention) and the routine cardiac rehabilitation group (control). For this purpose, the researcher will prepare 4 sheets, the number "1" will be written on two sheets for the first group, and the number "2" will be written on the two sheets for the second group. The cards are mixed in a container and randomly drawn one at a time for each patient without replacement until all four cards are drawn. Then four sheets are returned to the container, which is repeated until the sample volume is reached.

Blinding (investigator's opinion)

Single blinded

Blinding description

A cardiac rehabilitation nurse will perform assessments at each stage, blinded to random allocation. Also, the statistical analysis and outcome assessment will not know about the assignment of patients to two intervention and control groups during the analysis.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Hamadan University of Medical Sciences

Street address

Shahid Fahmideh Blvd., Pajouhesh Sq.

City

Hamadan

Province

Hamadan

Postal code

6517838698

Approval date

2023-12-11, 1402/09/20

Ethics committee reference number

IR.UMSHA.REC.1402.551

Health conditions studied

1

Description of health condition studied

Patients undergoing coronary artery bypass surgery

ICD-10 code

I25.1

ICD-10 code description

Atherosclerotic heart disease of native coronary artery

Primary outcomes

1

Description

Self-efficacy

Timepoint

Before, immediately after, and 3 months after the end of the intervention

Method of measurement

Using the cardiovascular disease management self-efficacy questionnaire of Steca et alii: The cardiovascular disease management self-efficacy questionnaire was designed and compiled by Steca et alii in 2015 to measure the self-efficacy of cardiovascular disease management. This questionnaire has 9 questions and 3

components of heart risk self-efficacy, treatment adherence self-efficacy, and symptom recognition self-efficacy. It is based on the Likert spectrum with questions such as (you can avoid life problems and difficult situations and daily stress well) Minimize stress well.). It measures the self-efficacy of cardiovascular disease management. The distribution of questionnaire questions is such that questions 1 to 4 examine the self-efficacy of heart risk, questions 5 and 6 examine the self-efficacy of following the treatment, and questions 7, 8, and 9 examine the self-efficacy of detecting symptoms.

Secondary outcomes

1

Description
Medication adherence
Timepoint
Before, immediately after, and 3 months after the end of the intervention
Method of measurement
Using the medication adherence reporting scale by Yan Chen et alii: The medication adherence reporting scale was compiled by Yan Chen et alii in 2019. This questionnaire contains 5 questions, and the frequency rating of each behavior in this questionnaire is based on a 5-point scale that is graded from never to always. The total score of the scale ranges from 5, which indicates the lowest level of adherence, to 25, which indicates the highest level of adherence.

Intervention groups

1

Description
Intervention group: After introducing the study and stating its objectives, if desired, the patients will complete the informed consent form, the demographic information form, the drug treatment adherence, and cardiac self-efficacy questionnaires. In addition to receiving routine cardiac rehabilitation provided at the hospital's cardiac rehabilitation center, this group of patients will receive the necessary training and care in the form of combined learning in both face-to-face and virtual departments. In the face-to-face department, patients will receive face-to-face training in various fields such as heart disease, diet, physical activity, and the benefits of cardiac rehabilitation for 1 month. In the virtual department, after completing the routine rehabilitation in the hospital, the patients will receive training and support for 3 months based on an application developed by the research team which will be installed on the phones of the patients or a family member who lives with them. This application will be designed based on the model of knowledge, attitude, and performance so that for each part of the model, a part will be seen in this application. Besides improving patients' knowledge in this way, they can communicate with the researcher and send their questions through it. At the same time as improves the knowledge of patients in the field of heart disease and cardiac rehabilitation and trying to change their attitude. The researcher changes their performance through this software by providing action plans, including sports activities, tailored to each person. The study's results will be examined through a questionnaire before the study, immediately after the completion of cardiac rehabilitation in the hospital, and 3 months later.
Category
Rehabilitation

2

Description
Control group: In this group, patients will enter the study after receiving informed consent and will complete the questionnaires. These people will only undergo routine cardiac rehabilitation in the hospital for one month (12 sessions, 3 times a week) and will not receive face-to-face and virtual training and care. At the end of the study, the training booklet will be given to this group. The study's results will be examined through a questionnaire before the study, immediately after the completion of cardiac rehabilitation in the hospital, and 3 months later.
Category
Rehabilitation

Recruitment centers

1

Recruitment center
Name of recruitment center
Farshchian Cardiovascular Hospital
Full name of responsible person
Ghazal Veisi
Street address
Shahid Fahmideh Blvd., Pajouhesh Sq.
City
Hamadan
Province
Hamadan
Postal code
6517838698
Phone
+98 81 3838 0535
Fax
+98 81 3838 0447
Email
ghazallv98@gmail.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Hamedan University of Medical Sciences
Full name of responsible person
Reza Shokoohi
Street address

Shahid Fahmideh Blvd., Pajouhesh Sq.

City
Hamadan

Province
Hamadan

Postal code
6517838698

Phone
+98 81 3838 0535

Fax
+98 81 3838 0447

Email
shokoohi@yahoo.com

Grant name

Grant code / Reference number

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

Title of funding source
Hamedan 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
Hamedan University of Medical Sciences

Full name of responsible person
Gazal Veisi

Position
Student

Latest degree
Bachelor

Other areas of specialty/work
Nursery

Street address
Shahid Fahmideh Blvd., Pajouhesh Sq.

City
Hamadan

Province
Hamadan

Postal code
6517838698

Phone
+98 81 3838 0535

Fax
+98 81 3838 0447

Email
ghazallv98@gmail.com

Person responsible for scientific inquiries

Contact

Name of organization / entity
Hamedan University of Medical Sciences

Full name of responsible person
Fatemeh Pakrad

Position
Assistant Professor

Latest degree
Ph.D.

Other areas of specialty/work
Nursery

Street address
Shahid Fahmideh Blvd., Pajouhesh Sq.

City
Hamadan

Province
Hamadan

Postal code
6517838698

Phone
+98 81 3838 0535

Fax
+98 81 3838 0447

Email
f_pakrad@yahoo.com

Person responsible for updating data

Contact

Name of organization / entity
Hamedan University of Medical Sciences

Full name of responsible person
Ghazal Veisi

Position
Student

Latest degree
Bachelor

Other areas of specialty/work
Nursery

Street address
Shahid Fahmideh Blvd., Pajouhesh Sq.

City
Hamadan

Province
Hamadan

Postal code
6517838698

Phone
+98 81 3838 0535

Fax
+98 81 3838 0447

Email
ghazallv98@gmail.com

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

I must provide all information for the sponsoring institution.

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