Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

A comparative study of traditional teaching methods and ai-developed clinical scenarios on the knowledge and performance of undergraduate nursing students in managing cardiopulmonary resuscitation (CPR)

Protocol summary

Study aim
Determining and comparing traditional education and an ai-developed clinical scenario–based educational method on the knowledge and performance of undergraduate nursing students in cardiopulmonary resuscitation management

Design
This study is a quasi-experimental two-group pretest–posttest design with a control group, examining the effect of an AI-based scenario-driven educational method on nursing students' knowledge and performance in cardiopulmonary resuscitation management, compared with traditional education. Sampling was convenience-based, and group allocation was conducted according to existing classes rather than full randomization

Settings and conduct
Research Setting: Classrooms and skills laboratories of the Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences.

Participants/Inclusion and exclusion criteria
Inclusion criteria: Sixth-semester undergraduate nursing student at Isfahan University of Medical Sciences; currently undertaking the practicum of the course "Emergency Nursing in Crises and Disasters"; completion of all relevant prerequisite courses; completion of theoretical and practical training in cardiopulmonary resuscitation (CPR) in the second semester; willingness and informed consent to participate in the study.

Intervention groups
Control Group: Traditional lecture and mannequin-based practice. Intervention Group: Traditional training plus AI-generated scenario practice with instructor feedback. This method includes reviewing artificial intelligence–generated scenarios in the practical class (practicum), addressing questions and clarifications by the instructor, and hands-on practice using a training manikin.

Main outcome variables
Knowledge and performance in the management of patients requiring cardiopulmonary resuscitation

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20251213068302N1**
Registration date: **2026-01-07, 1404/10/17**
Registration timing: **prospective**

Last update: **2026-01-07, 1404/10/17**
Update count: **0**

Registration date
2026-01-07, 1404/10/17

Registrant information

Name
Mohammad Javad Laali Dastjerdi

Name of organization / entity

Country
Iran (Islamic Republic of)

Phone
+98 31 4540 2771

Email address
mohammadjavadlaali@nm.mui.ac.ir

Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2026-02-04, 1404/11/15

Expected recruitment end date
2026-04-04, 1405/01/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

A comparative study of traditional teaching methods and ai-developed clinical scenarios on the knowledge and performance of undergraduate nursing students in managing cardiopulmonary resuscitation (CPR)

Public title

The effect of artificial intelligence–generated clinical scenario–based training on nursing students' knowledge and performance in cardiopulmonary resuscitation

Purpose

Education/Guidance

Inclusion/Exclusion criteria

Inclusion criteria:

The participant must be a sixth-semester undergraduate nursing student at Isfahan University of Medical Sciences, currently enrolled in the practical component of the course "Emergency Nursing in Crises and Disasters," having completed all prerequisite courses. The participant must express a willingness to take part in the study. All participants must have completed both theoretical and practical training in cardiopulmonary resuscitation (CPR) during their second semester.

Exclusion criteria:

Age

No age limit

Gender

Both

Phase

N/A

Groups that have been masked

- Data analyser

Sample size

Target sample size: **60**

Randomization (investigator's opinion)

Not randomized

Randomization description

Blinding (investigator's opinion)

Single blinded

Blinding description

In this single-blind study, the data analyst will be blinded using the following procedure: The intervention groups (traditional training and training based on AI-generated clinical scenarios) will be coded with neutral labels such as "Group A" and "Group B" prior to data analysis. A researcher not involved in the data analysis process will be responsible for assigning and maintaining the group allocation codes. The dataset provided to the analyst will include only anonymized participant identifiers and the coded group labels, with no information revealing the nature of the interventions. The analyst will conduct all statistical analyses without knowledge of the specific intervention assigned to each group. Upon completion of the primary analysis and documentation of the results, the actual group identities will be disclosed to the research team for final interpretation.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Research Ethics Committees of Nursing, Rehabilitation and Management schools- Isfahan University of

Street address

Deputy of Research and Technology Building No. 4, Isfahan University of Medical Sciences and Health Services, Hezar Jarib Street

City

Isfahan

Province

Isfehan

Postal code

81746-73461

Approval date

2025-12-13, 1404/09/22

Ethics committee reference number

IR.MUI.NUREMA.REC.1404.130

Health conditions studied

1

Description of health condition studied

Cardiopulmonary arrest

ICD-10 code

I46

ICD-10 code description

Cardiac arrest

Primary outcomes

1

Description

Knowledge of cardiopulmonary resuscitation (CPR) patient management

Timepoint

Measurement of knowledge of cardiopulmonary resuscitation (CPR) patient management before and after completion of the intervention

Method of measurement

Researcher-constructed Cardiopulmonary Resuscitation (CPR) Knowledge Questionnaire

2

Description
Performance in cardiopulmonary resuscitation (CPR) patient management

Timepoint
Measurement of performance in cardiopulmonary resuscitation (CPR) patient management before and after completion of the intervention

Method of measurement
Performance Evaluation Checklist for Cardiopulmonary Resuscitation (CPR) developed by the School of Nursing, Isfahan University of Medical Sciences

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group: In the intervention group, in addition to routine and traditional instruction, scenario-based training will be conducted at the end of each practice session. Scenarios for teaching the topic of cardiopulmonary resuscitation (CPR) patient management will be developed using a generative artificial intelligence model, and the instruction will be delivered based on a scenario-based learning approach. This method includes reviewing the scenarios in practical (skills) classes, providing feedback and clarification by the instructor, and conducting hands-on practice using an educational mannequin.In this group, questionnaires (completed by the students) and checklists (completed by the instructor acting as the evaluator) will be administered before and after the intervention. The instructor, duration, and number of sessions will be identical for both groups. For the intervention group, five two-hour practical training sessions incorporating AI-developed scenarios will be implemented.

Category
Other

2

Description
Control group: For the control group, instruction on the management of patients requiring cardiopulmonary resuscitation (CPR) will be delivered using the traditional method, consisting of lectures accompanied by hands-on practice on an educational mannequin. Questionnaires and checklists will be completed before and after the intervention. The instructor, duration, and number of sessions will be identical for both groups. For the control group, five two-hour routine practical training sessions will be conducted in the skills laboratory, implemented according to the written lesson plan and without the use of scenarios.

Category
Other

Recruitment centers

1

Recruitment center

Name of recruitment center
Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences

Full name of responsible person
Dr. Mohsen Shahriari

Street address
Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences and Health Services, Hezar Jarib Street, Isfahan, Iran

City
Isfahan

Province
Isfehan

Postal code
8174673461

Phone
+98 31 3668 7153

Email
webmaster@nm.mui.ac.ir

Web page address
https://nm.mui.ac.ir/

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Esfahan University of Medical Sciences

Full name of responsible person
Dr. Gholamreza Asgari

Street address
Vice-Chancellor for Research and Technology, Building 4, Isfahan University of Medical Sciences and Health Services, Hezar Jarib Street, Isfahan, Iran

City
Isfahan

Province
Isfehan

Postal code
81746-73461

Phone
+98 31 3668 7898

Email
research@mui.ac.ir

Web page address
https://research.mui.ac.ir/fa

Grant name

Grant code / Reference number

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

Title of funding source
Esfahan 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

Esfahan University of Medical Sciences

Full name of responsible person

Mohammad Sadegh Aboutalebi Nasrabad

Position

Instructor

Latest degree

Master

Other areas of specialty/work

Nursery

Street address

Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences and Health Services, Hezar Jarib Street, Isfahan, Iran

City

Isfahan

Province

Isfehan

Postal code

8174673461

Phone

+98 31 3792 1500

Email

aboutalebi@nm.mui.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity

Esfahan University of Medical Sciences

Full name of responsible person

Mohammad Sadegh Aboutalebi Nasrabad

Position

Instructor

Latest degree

Master

Other areas of specialty/work

Nursery

Street address

Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences and Health Services, Hezar Jarib Street, Isfahan, Iran

City

Isfahan

Province

Isfehan

Postal code

8174673461

Phone

+98 31 3792 1500

Email

aboutalebi@nm.mui.ac.ir

Person responsible for updating data

Contact

Name of organization / entity

Esfahan University of Medical Sciences

Full name of responsible person

Mohammad Sadegh Aboutalebi Nasrabad

Position

Instructor

Latest degree

Master

Other areas of specialty/work

Nursery

Street address

Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences and Health Services, Hezar Jarib Street, Isfahan, Iran

City

Isfahan

Province

Isfehan

Postal code

8174673461

Phone

+98 31 3792 1500

Email

aboutalebi@nm.mui.ac.ir

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 additional information available.

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