Clinical Trial Protocol
Iranian Registry of Clinical Trials

31 Oct 2026

Comparing the Effectiveness of an Intelligent Interactive Chatbot and Virtual Training on Emergency Nurses’ Triage Knowledge and Performance

Protocol summary

Study aim

Determining the Effectiveness of Intelligent Interactive Chatbot and Virtual Training on Emergency Department Nurses' Triage Knowledge and Performance

Design

a quasi-experimental study with a pretest,posttest design and a non-randomized controlled trial. Three hospitals were randomly assigned to two intervention groups (online education and chatbot) and a control group, and qualified nurses were recruited through a convenience sampling method. The sample size: 132

Settings and conduct

This study will be conducted in the emergency departments of Shariati, Sina, and Mehdi Clinic hospitals of Imam Khomeini Hospital Complex, each of the three hospitals will be randomly assigned to one of the three study groups. Eligible nurses will be included in the study using convenience sampling, then a pre-test will be administered to all participants, and educational interventions will be implemented for each group over a two-week period. At the end of the intervention period, a post-test will be administered.

Participants/Inclusion and exclusion criteria

Have a bachelor's degree in nursing Have not attended a triage training course in the past three months Access to a smartphone

Intervention groups

ntervention Group 1: Nurses will participate in three 45-60 minute interactive webinar sessions of triage training over two weeks. Training will be delivered via Skyroom or Meet, with content approved by the expert team. Intervention Group 2: ESI triage training will be delivered via an interactive chatbot over two weeks, including multimedia content, simulated clinical scenarios and educational feedback. After a technical pilot, the chatbot will provide personalized and interactive training by sending daily reminder messages, recording interactions, and assessing adherence. Control Group: the current status of the ward regarding triage will be considered.

Main outcome variables

Triage knowledge and practice

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20251224068434N1**
Registration date: **2026-01-04, 1404/10/14**
Registration timing: **prospective**

Last update: **2026-01-04, 1404/10/14**
Update count: **0**

Registration date

2026-01-04, 1404/10/14

Registrant information

Name

Mahdieh Khadem

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 8801 6071

Email address

mahdieh2001.khadem@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-01-21, 1404/11/01

Expected recruitment end date

2026-09-22, 1405/06/31

Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Comparing the Effectiveness of an Intelligent Interactive Chatbot and Virtual Training on Emergency Nurses' Triage Knowledge and Performance

Public title
Comparing the Effectiveness of an Intelligent Interactive Chatbot and Virtual Training on Emergency Nurses' Triage Knowledge and Performance
Purpose
Education/Guidance
Inclusion/Exclusion criteria
Inclusion criteria:
Having a bachelor's degree in nursing Failure to participate in triage training in the past three months Smartphone access
Exclusion criteria:
Age
No age limit
Gender
Both

Phase
N/A
Groups that have been masked
No information
Sample size
Target sample size: **132**
Randomization (investigator's opinion)
Not randomized
Randomization description
Blinding (investigator's opinion)
Not blinded
Blinding description
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Research Ethics Committee of School of Nursing and midwifery And Rehabilitation- Tehran University
Street address
6th floor. Central Headquarters of Tehran University of Medical Sciences, at the corner of Ghods Street, Keshavarz Boulevard
City
Tehran
Province
Tehran
Postal code
1419733171
Approval date
2025-12-10, 1404/09/19
Ethics committee reference number
IR.TUMS.FNM.REC.1404.191

Health conditions studied

1

Description of health condition studied
ESI Triage training
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Triage knowledge score of emergency nurses in the triage knowledge assessment questionnaire
Timepoint
Before the intervention and one month after the intervention
Method of measurement
Triage Knowledge Assessment Questionnaire

2

Description
Triage performance score of emergency nurses in the triage performance assessment questionnaire
Timepoint
Before the intervention and one month after the intervention
Method of measurement
Triage Performance Measurement Questionnaire

Secondary outcomes

1

Description
Satisfaction score with the educational method in the satisfaction questionnaire
Timepoint
One month after the intervention
Method of measurement
acceptance and satisfaction questionnaire

Intervention groups

1

Description

Intervention group 1: The first intervention group: includes triage training in the form of three interactive online sessions over two weeks, each session lasting 45 to 60 minutes and the time is determined based on the nurses' opinions. The trainings are held via Skyroom or Meet and with content based on the latest version of ESI triage, and a question and answer period is considered at the end of each session. The training content will be presented after approval by emergency medicine and emergency nursing specialists.

Category

Other

2

Description

Intervention group 2: The educational content will be prepared in the form of short text files, simple audio files, infographics, short videos, and educational scenarios based on the latest version of the ESI triage system, and then uploaded to the chatbot's internal database. The chatbot design includes the compilation of scientific content based on reliable triage sources, simulated clinical scenarios, multiple-choice questions, and nursing decision-making situations, and the intervention period will be two weeks. The chatbot used in this study is an automated interactive response system based on generative artificial intelligence, whose processing infrastructure is based on GPT version 40 of OpenAI, and will be designed to provide training and support in the field of hospital triage to nurses. The chatbot will be trained through a fine-tuning process to answer questions accurately and effectively and will interact with users continuously. Based on the official ESI guide, a set of clinical scenarios will be designed to cover the full range of ESI levels, and the scenarios will be reviewed by the research team. For each scenario, the correct answer and ESI decision logic will be provided, and after the user selects the triage level, the system will provide feedback on the correct answer, decision logic, and key training points. All interactions will be stored and reviewed by the research team. In order to ensure the technical performance of the system, an initial pilot study will be conducted on 10 nurses, and the resulting data will be used solely to address technical and content deficiencies. To increase participation, the chatbot will automatically send daily reminder messages. Sustained non-interaction is defined as complete cessation of chatbot use for 4 consecutive days, and “low adherence” will be considered as an average use of less than three times a week. The effect of the intervention will be analyzed separately in the subgroup that meets this adherence criterion. In this study, the chatbot will be developed and evaluated based on the CONSORT Guidelines for Clinical Trials of Artificial Intelligence Interventions, version 2025, to ensure the quality of reporting and transparency of the process.

Category

Other

3

Description

Control group: In the control group, the current status of the ward regarding triage will be considered, and after the end of the study, the prepared educational content will be made available to them in order to comply with ethical considerations.

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center

Shariati hospital

Full name of responsible person

Mahdieh Khadem

Street address

Dr. Shariati Educational, Research, and Treatment Center, Opposite the Faculty of Economics, Jalal Al-e Ahmad Intersection (Seh-Rah-e Jalal Al-e Ahmad), North Kargar Street, Tehran, Iran

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1411713135

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2

Recruitment center

Name of recruitment center

Mehdi Clinic, Imam Khomeini Hospital Complex

Full name of responsible person

Mahdieh Khadem

Street address

Imam Khomeini Hospital Complex, End of Keshavarz Boulevard, Tehran, Iran

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3

Recruitment center

Name of recruitment center

Sina hospital

Full name of responsible person
Mahdieh Khadem

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
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Full name of responsible person
Deputy for Research and Technology

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Grant name

Grant code / Reference number

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

Title of funding source
Tehran 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
Tehran University of Medical Sciences

Full name of responsible person
Mahdieh Khadem

Position
Master student in emergency nursing

Latest degree
Bachelor

Other areas of specialty/work
Nursery

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Person responsible for scientific inquiries

Contact

Name of organization / entity
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Full name of responsible person
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Nursery

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Person responsible for updating data

Contact

Name of organization / entity
Tehran University of Medical Sciences

Full name of responsible person

Mahdieh Khadem
Position
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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Yes - There is a plan to make this available
Study Protocol
Undecided - It is not yet known if there will be a plan to make this available
Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available
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
Undecided - It is not yet known if there will be a plan to make this available
Data Dictionary
Undecided - It is not yet known if there will be a plan to make this available
Title and more details about the data/document
Yes - There is a plan to make this available
When the data will become available and for how long
The access period is 12 months after the publication of the article.
To whom data/document is available
Researchers employed at reputable institutions with a motivation for improvement.
Under which criteria data/document could be used
The data from this study can be used for research and scientific purposes. The use of the data is subject to the submission of a formal request, stating the purpose of the research, and approval by the responsible researcher. The data will be provided to the applicant anonymously, and compliance with the principles of research ethics is mandatory.
From where data/document is obtainable
They should be in contact with the corresponding author at the email address.
What processes are involved for a request to access data/document
After the process of eligibility researcher and verification, the request recipient's information will be shared with study collaborators, and the publishable data will be made available.
Comments