Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

Comparing the Effectiveness of the MNV Educational Model (Metaphor–Narrative–Visualization) with the Traditional Teaching Method on Diagnostic Reasoning, Cognitive Load, Learning Retention, and Satisfaction in General Practitioners

Protocol summary

Study aim
To compare mean diagnostic reasoning scores between the intervention and control groups. To compare mean learning retention scores at three-month follow-up. To compare mean cognitive load scores between the two groups. To compare mean user satisfaction scores between the two groups. To determine the correlation between demographic variables and intervention effectiveness

Design
Randomized controlled trial with a control group, parallel groups, single-blind (outcome assessor), no drug phase. Sample size: 60 (30 MNV intervention, 30 control). Simple randomization using Random Allocation software. The intervention group receives 4 clinical topics via the MNV model in four 60-minute sessions over 2 weeks; the control group receives the same topics traditionally. Three-month follow-up.

Settings and conduct
In Kerman health centers; 60 GPs randomized to MNV vs. traditional; four 60-min sessions over 2 weeks; assessments at pre, post, and 3-month follow-up; outcome assessor blinded.

Participants/Inclusion and exclusion criteria
RCT in 60 GPs comparing the MNV educational model with traditional teaching on diagnostic reasoning, cognitive load, retention, and satisfaction. Blinded outcome assessment.

Intervention groups
Intervention Group (MNV): 30 general practitioners; training on 4 clinical topics (myocardial infarction, lobar pneumonia, acute kidney injury, liver cirrhosis) using the MNV model with three layers: visual metaphor, structured storytelling, and interactive visualization. Four 60-minute sessions over 2 weeks. Control Group (Traditional): 30 general practitioners; same 4 topics via conventional lecture with text-image slides and handouts, without metaphor, storytelling, or interaction. Four 60-minute sessions over 2 weeks. Conditions were matched between groups

Main outcome variables
Diagnostic reasoning; learning retention 2-month free recall)

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20260213068845N3**
Registration date: **2026-09-12, 1405/06/21**
Registration timing: **registered_while_recruiting**

Last update: **2026-09-12, 1405/06/21**
Update count: **0**

Registration date
2026-09-12, 1405/06/21

Registrant information

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Name of organization / entity

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Iran (Islamic Republic of)

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Recruitment status
recruiting

Funding source

Expected recruitment start date
2026-09-12, 1405/06/21
Expected recruitment end date
2026-11-12, 1405/08/21
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Comparing the Effectiveness of the MNV Educational Model (Metaphor–Narrative–Visualization) with the Traditional Teaching Method on Diagnostic Reasoning, Cognitive Load, Learning Retention, and Satisfaction in General Practitioners

Public title
The Effect of Metaphorical Storytelling and Multimedia Education on Diagnostic Reasoning and Learning Retention in General Practitioners
Purpose
Education/Guidance
Inclusion/Exclusion criteria
Inclusion criteria:
Holding a Doctor of Medicine (MD) degree. Working as a physician in comprehensive health service centers affiliated with Kerman University of Medical Sciences Having at least 1 year of clinical work experience after graduation. Willingness to participate in the study and signing the informed consent form. No concurrent participation in similar educational courses.
Exclusion criteria:
Not holding a Doctor of Medicine (MD) degree (or being a student). Not working as a physician in comprehensive health service centers affiliated with Kerman University of Medical Sciences. Having less than 1 year of clinical work experience after graduation. Unwillingness to participate in the study or not signing the informed consent form. Concurrent participation in other educational courses similar to this study's educational model. Physical or time-related inability to attend the four training sessions.
Age
From **30 years** old to **60 years** old
Gender
Both

Phase
N/A
Groups that have been masked

- Outcome assessor

Sample size
Target sample size: **60**
More than 1 sample in each individual
Number of samples in each individual: **30**
Each participant (general practitioner) provides one sample, consisting of a complete dataset. This dataset includes demographic information, diagnostic reasoning test scores, free recall test scores, the cognitive load questionnaire, and the user satisfaction questionnaire, collected at pre-test, post-test, and three-month follow-up stages. Each participant is assigned to only one group (intervention or control), and their data are analyzed independently. Therefore, each person provides one sample for the study.
Randomization (investigator's opinion)
Randomized
Randomization description
Randomization is performed using simple randomization at the individual level. Stratified randomization based on demographic variables is not applied. The unit of randomization is the individual (each general practitioner). The random sequence is generated using Random Allocation software by a person independent of the principal investigator. Allocation concealment is ensured using sequentially numbered, opaque, sealed envelopes or central allocation by an independent person. The outcome assessor is blinded to group allocation. Participants are not blinded due to the nature of the educational intervention.
Blinding (investigator's opinion)
Single blinded
Blinding description
The study is single-blind; only the outcome assessor is blinded to group allocation. Participants and the principal investigator are not blinded due to the educational intervention. The assessor does not attend sessions and scores tests using only ID codes without group labels. If possible, the data analyst remains blinded using A/B codes. No Data Safety and Monitoring Committee is formed.
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics Committee of Kerman University of Medical Sciences
Street address
Kerman, at the beginning of Haft Bagh-e Alavi Axis, University of Medical Sciences Campus
City
kerman
Province
Kerman
Postal code
7616910002
Approval date
2026-08-16, 1405/05/25
Ethics committee reference number
IR.KMU.REC.1405.261

Health conditions studied

1

Description of health condition studied
Myocardial Infarction
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Primary outcome 1: Diagnostic reasoning score measured by a researcher-made 20-item multiple-choice test (score range 0–20).
Timepoint
Before the intervention (pre-test) and immediately after the intervention (post-test).
Method of measurement
Diagnostic reasoning score is measured using a researcher-made 20-item multiple-choice test (each item has 4 options with one correct answer). The score range is 0–20, and a higher score indicates better diagnostic reasoning.

2

Description
Learning retention score measured by a 10-item free recall test (each item with 4 keywords; score range 0–40) at three-month follow-up.
Timepoint
two months after the intervention (2-month follow-up).
Method of measurement
Learning retention score is measured using a 10-item free recall test. Each item has 4 keywords, and the score range is 0–40. A higher score indicates greater retention of information.

Secondary outcomes

1

Description
Cognitive load score measured using the Cognitive Load Questionnaire (Klepsch et al., 2017), consisting of 8 items on a 7-point Likert scale. It covers three subscales: intrinsic load, extraneous load, and germane load. A higher extraneous load score indicates greater unnecessary cognitive load.
Timepoint
Immediately after each training session.
Method of measurement
The Cognitive Load Questionnaire (Klepsch et al., 2017) with 8 items rated on a 7-point Likert scale (1 = very low to 7 = very high) is administered to participants. Each subscale score is calculated as the mean of its corresponding items.

2

Description
User satisfaction score measured by a researcher-made 15-item questionnaire covering 4 domains: quality of educational content, presentation method, interaction with instructor and content, and clinical applicability. It uses a 5-point Likert scale, with a total score range of 15–75; higher scores indicate greater satisfaction.
Timepoint
Immediately after the intervention
Method of measurement
The user satisfaction questionnaire contains 15 items across 4 domains. Responses are scored on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), and the total score ranges from 15 to 75.

Intervention groups

1

Description
Intervention group: 30 general practitioners. Training on 4 clinical topics (myocardial infarction, lobar pneumonia, acute kidney injury, liver cirrhosis) using the MNV educational model with three layers: (1) persistent visual metaphors, (2) structured storytelling, (3) interactive visualization (static image, 30-second animation, scientific ID, targeted scenario). Four 60-minute sessions over 2 weeks (2 sessions per week). Each session includes a quick pre-test, animation with audio narrative, interactive teaching, targeted scenario solving, structured review, and post-test/Q&A.
Category
Other

2

Description
Control group:30 general practitioners. Training on the same 4 clinical topics via conventional lecture with text-image PowerPoint slides and a text handout, without coherent metaphor, storytelling, or interactive content. Four 60-minute sessions over 2 weeks (2 sessions per week). Each session includes a quick pre-test, a 30-minute lecture, two simple clinical cases without immediate feedback, review and summary, and post-test/Q&A.
Category
Other

Recruitment centers

1

Recruitment center
Name of recruitment center
مراکز خدمات جامع سلامت تحت پوشش دانشگاه علوم پزشکی کرمان
Full name of responsible person
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Kerman University of Medical Sciences

Full name of responsible person
Research Deputy, Kerman University of Medical Sciences

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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
Kerman 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
Kerman University of Medical Sciences

Full name of responsible person
samaneh movahedinia

Position
professor

Latest degree
Specialist

Other areas of specialty/work
Gynecology and Obstetrics

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Person responsible for scientific inquiries

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Specialist

Other areas of specialty/work
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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

Yes - There is a plan to make this available

Informed Consent Form

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Yes - There is a plan to make this available

Data Dictionary

Yes - There is a plan to make this available

Title and more details about the data/document

De-identified individual participant data (IPD), including demographic data, diagnostic reasoning scores, free recall scores, cognitive load questionnaire, and user satisfaction questionnaire. Also, the study protocol, informed consent form, and statistical analysis plan.

When the data will become available and for how long

From 6 months after publication of the main results until 5 years after publication.

To whom data/document is available

Academic researchers and reputable research institutions, after approval of the request by the principal investigator and the ethics committe

Under which criteria data/document could be used

For non-commercial research, meta-analysis, secondary analysis, and educational purposes only. Use is conditional upon signing a data use agreement, maintaining confidentiality, not attempting to identify participants, and citing the original source.

From where data/document is obtainable

Principal Investigator: Samaneh Movahedi Nia, Kerman University of Medical Sciences,

What processes are involved for a request to access data/document

A written request including the research purpose, analysis plan, ethics committee approval, and data use agreement is sent to the principal investigator. The request is reviewed by the principal investigator and the ethics committee. If approved, de-identified data are securely provided to the applicant.

Comments