

Use of DeepSeek in Geriatric Caregivers' Simulation Training

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Dear Editor,

Simulation-based learning (SBL) in medical training refers to the use of technology to recreate medical scenarios in controlled environments (1). This approach allows healthcare providers to practice and improve their skills without the immediate risk of harming patients (2). Repetition in a controlled setting helps develop decision making skills and boosts confidence, thus enhancing patient safety. SBL can be highly beneficial for geriatric caregivers without a medical background in noticing sudden deterioration, early onset of medical emergencies, stroke or myocardial infarct, and detection of red flag signs after fall injury at home etc.

The emphases of SBL are not only on hands-on practice, skills and confidence building, but also immediate feedback, safety awareness and building emotional resilience (3). Recently, DeepSeek has emerged as a groundbreaking tool in artificial intelligence (4). This interactive chatbot could write up various clinical scenarios for pre-hospital care training, allowing caregivers with an opportunity to experience SBL at home with the computers, sets, or even smart phones. By leveraging natural language processing and machine learning, DeepSeek is able to create realistic and interactive scenarios that mimic real-life situations encountered by geriatric caregivers, for example dyspnea, hemiplegia, angina, or even checklist-based questions for assessment after geriatric fall injuries. Debriefing is an essential part of SBL, DeepSeek could cater different learning styles through interactive chat and provide instant feedback, ensuring caregivers can practice and refine their skills in a controlled and supportive environment virtually.

Other than physical health, psychological and mental SBL are also available for caregivers (5). For instance, DeepSeek can simulate a situation where a caregiver needs to assist an elderly patient with dementia who is experiencing behavioral disturbance and agitation. The chatbot guides the caregiver through the steps of calming the patient, providing emotional support, and ensuring their safety. The interactive nature of the training allows caregivers to develop effective communication techniques and empathy, which are crucial for building trust and rapport with elderly patients.

Caregivers often face stress situations that require quick decision making and precise actions. Through simulation training, caregivers can practice these critical skills without the risk of causing harm to real patients. DeepSeek allows a safe space for caregivers to make mistakes, learn from them, and build confidence in their abilities. In addition, the chatbot can response to emergencies such as falls or sudden medical deteriorations as if telemedicine. By repeatedly engaging in these simulations, caregivers become better prepared to handle emergencies calmly and effectively, increasing the likelihood of timely medical attendance in real-life scenarios.

Another aspect of SBL involves medication administration (6). Through the step-by-step guides of verifying prescriptions, calculating dosages, and monitoring for potential side effects, caregivers could receive instant feedback to avoid mistakes. As caregivers gain proficiency in these tasks, their confidence in providing care increases, ultimately leading to better patient outcomes.

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Step 2: Interactive FAST Evaluation

DeepSeek guides the user through a virtual examination:

1. Face Drooping:

- "Ask your father to smile. Observe his face. Does one side droop or feel numb?"
- **User Input:** "His left smile is weaker."
- **Feedback:** "This is a red flag for stroke. Proceed to the next step."

2. Arm Weakness:

- "Ask him to raise both arms. Does one arm drift downward or feel weak?"
- **User Input:** "His left arm can't stay up."
- **Feedback:** "Arm weakness is another stroke sign. Continue."

3. Speech Difficulty:

- "Ask him to repeat: 'The early bird catches the worm.' How does he respond?"
- **User Input:** "His speech is slurred and jumbled."
- **Feedback:** "Speech issues strongly suggest a stroke. Time to act!"

Step 3: Time-Sensitive Decision-Making

DeepSeek presents critical choices:

"It's been 5 minutes since symptoms started. What do you do?"

Options:

1. Wait 15 minutes to see if symptoms resolve.
2. Drive him to the hospital yourself.
3. **Call emergency services immediately.**

Correct Answer: 3. Call emergency services immediately

- **Feedback:** "Correct! Every minute matters. Calling an ambulance ensures faster treatment and safer transport."

Step 4: Post-Simulation Debrief

DeepSeek provides a summary:

1. Key Takeaways:

- FAST criteria (Face, Arms, Speech, Time).
- Importance of immediate action (time = brain cells saved).

2. Common Mistakes:

- Waiting to see if symptoms improve.
- Transporting the patient without professional help.

3. Real-World Stats:

- "Patients who arrive at the hospital within 3 hours of symptoms have better recovery rates."

Advanced Simulation Features

To enhance realism, DeepSeek could incorporate:

Message DeepSeek

Figure 1. DeepSeek-V3 chat. A simulation-based learning scenario on acute stroke of an elderly

In short, the use of DeepSeek enhances caregivers' learning experiences, promotes safe practice, improves competence and confidence, and fosters emotional resilience. The integration of driven simulation training could better equip caregivers to meet the complex needs of elderly patients.

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