



INTEGRATING AI-ASSISTED MEDICAL ENGLISH MODULES INTO CLINICAL SIMULATION: IMPACT ON NURSING STUDENTS' COMMUNICATION CONFIDENCE IN TELEHEALTH SETTINGS

MENGINTEGRASIKAN MODUL BAHASA INGGRIS MEDIS BERBANTUAN AI KE DALAM SIMULASI KLINIS: DAMPAKNYA TERHADAP KEPERCAYAAN KOMUNIKASI MAHASISWA KEPERAWATAN DALAM PENGATURAN TELEHEALTH

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Abstract

The use of Medical English in telehealth settings has become an essential requirement due to the rapid global expansion of remote healthcare counseling and consultations. However, nursing students often experience a lack of communication confidence when interacting in English within virtual clinical scenarios. This study aimed to evaluate the impact of integrating AI-assisted Medical English modules into clinical simulation on nursing students' communication confidence in telehealth settings. A quantitative method with a quasi-experimental pre-test and post-test design was employed. The study involved 57 final-year nursing students at STIKes Darussalam Lhokseumawe selected via total sampling. The research was conducted in July 2026. Data were collected using a telehealth communication confidence scale questionnaire administered before (pre-test) and after (post-test) the AI-assisted intervention. Data were analyzed univariately and bivariately using the Paired Sample t-test. The results demonstrated a significant increase in the mean communication confidence score from 52.4 (moderate/low category) at pre-test to 78.6 (good category) at post-test. Statistical analysis revealed a p-value of 0.001 ($p < 0.05$), indicating a statistically significant effect of integrating AI-assisted Medical English modules into clinical simulations on enhancing nursing students' communication confidence in telehealth settings. It is concluded that incorporating AI tools into remote counseling simulations effectively improves nursing students' English communication readiness and confidence.

Keywords : Artificial Intelligence, Medical English, Clinical Simulation, Telehealth, Communication Confidence, Nursing.



Abstrak

Penggunaan Bahasa Inggris Medis dalam konteks layanan telehealth menjadi kebutuhan penting seiring dengan pesatnya perkembangan konseling dan konsultasi kesehatan jarak jauh secara global. Namun, mahasiswa keperawatan sering mengalami kendala kepercayaan diri saat berkomunikasi dalam Bahasa Inggris pada situasi klinis virtual. Penelitian ini bertujuan untuk menguji dampak integrasi modul Bahasa Inggris Medis berbasis kecerdasan buatan (AI) ke dalam simulasi klinis terhadap kepercayaan diri komunikasi mahasiswa keperawatan dalam pengaturan telehealth. Penelitian ini menggunakan metode kuantitatif dengan desain eksperimen kuasi (Quasi-experimental design: Pre-test vs Post-test). Populasi dan sampel penelitian ini adalah mahasiswa tingkat akhir STIKes Darussalam Lhokseumawe sebanyak 57 responden yang dipilih menggunakan teknik total sampling. Penelitian dilaksanakan pada bulan Juli 2026. Pengumpulan data dilakukan menggunakan kuesioner skala kepercayaan diri komunikasi telehealth sebelum (pre-test) dan sesudah (post-test) intervensi berbasis AI. Data dianalisis secara univariat dan bivariat menggunakan uji Paired Sample t-test. Hasil penelitian menunjukkan bahwa rata-rata skor kepercayaan diri komunikasi mahasiswa meningkat secara signifikan dari 52,4 (kategori kurang/cukup) pada saat pre-test menjadi 78,6 (kategori baik) pada saat post-test. Hasil uji statistik menunjukkan nilai $p=0,001$ ($p<0,05$), yang mengindikasikan bahwa terdapat pengaruh signifikan dari integrasi modul Bahasa Inggris Medis berbasis AI dalam simulasi klinis terhadap peningkatan kepercayaan diri komunikasi mahasiswa keperawatan dalam layanan telehealth. Disimpulkan bahwa pemanfaatan alat AI dalam simulasi konseling jarak jauh efektif dalam meningkatkan kesiapan dan kepercayaan diri komunikasi bahasa Inggris mahasiswa keperawatan.

Kata Kunci : Artificial Intelligence, Bahasa Inggris Medis, Simulasi Klinis, Telehealth, Kepercayaan Diri Komunikasi, Keperawatan.

1. INTRODUCTION

The development of digital information and communication technology has brought about significant changes in the delivery of global healthcare services. One future-oriented application is telehealth consultation and counseling services. Telehealth enables clinical interactions between healthcare professionals and patients without geographic boundaries, opening up access to healthcare services across national borders, and facilitating international interprofessional communication. In this context, mastery of Medical English is a crucial modality for prospective healthcare professionals, particularly nursing students, to enable them to provide effective, accurate, and empathetic nursing care through digital communication media (Wager, Lee, & Glaser, 2022).

Despite growing recognition of the importance of this competency, traditional English for Nursing instruction often faces challenges in creating a realistic and interactive practice environment. Conventional learning methods tend to focus on vocabulary and grammar mastery without providing space for responsive, interactive conversation simulations. As a result, students often experience high levels of anxiety and low confidence when asked to conduct counseling or history-taking in English, especially when faced with simulated telehealth scenarios that require precise medical syntax and fluent real-time communication.

To address this gap, the use of Artificial Intelligence (AI) technology offers potentially novel opportunities in nursing education. AI-based tools, such as natural language processing (NLP) and interactive chatbots, can be programmed to simulate the role of international patients with various clinical conditions in remote counseling scenarios. This AI-based learning provides instant feedback on pronunciation, grammar, adherence to medical communication protocols, and empathetic responses. The integration of AI modules into telehealth clinical simulations provides a safe, iterative, and personalized practice environment without the fear of making clinical errors directly with patients (Putra et al., 2023).



The policy framework and higher education framework for nursing in Indonesia emphasize the importance of curriculum modernization through the implementation of digital-based learning technologies to address the challenges of global competency. The nursing curriculum is required to equip students not only with basic psychomotor skills but also with digital adaptability and international interprofessional communication skills. The use of clinical simulations combined with AI-based interactive modules aligns with the transformation of modern healthcare education, which focuses on patient safety and graduate competency excellence (Ministry of Health of the Republic of Indonesia, 2022).

The positive impact of integrating interactive modules and digital simulation technology on learning outcomes has been supported by a wide range of scientific literature. Numerous studies have shown that technology-based interactive simulations can optimize learning outcomes, enhance information retention, and reduce communication anxiety. In the context of language communication training, the use of interactive AI agents has been shown to increase student engagement and provide structured practice, directly impacting confidence and fluency (Aga et al., 2021).

In addition to improving confidence and the quality of communication documentation, the implementation of AI modules in clinical simulations has also been shown to increase the efficiency of the learning process. The use of an AI-based intelligent learning system allows for measurable analysis of student performance. It provides precise diagnosis of communication weaknesses and facilitates flexible, self-paced learning. However, the effectiveness of this technology depends heavily on how the modules are systematically designed and integrated into existing nursing clinical simulation flows (Campanella et al., 2016). In the context of implementation in health universities in Indonesia, particularly in regional areas, the integration of AI technology for teaching Medical English still faces challenges such as infrastructure readiness, material compliance with accreditation standards, and student adaptation to new media. The success of AI module integration is measured not only by the sophistication of the software, but also by the extent to which the technology can increase students' confidence and preparedness in facing real-life clinical situations in the telehealth era (Wardhana, Sumijatun, & Kodyat, 2025).

Other research on the implementation of technology-based learning in hospitals and healthcare education also shows that interactive systems can help improve operational efficiency, data management, and service quality. However, in practice, various obstacles can still be encountered, such as system disruptions, inconsistent implementation of operational procedures, limited user training, and system mismatches with service needs. This situation suggests that the integration of information systems and AI technology must be carried out continuously through evaluation and improvement. A good system is not only one that is technically functional, but also one that can provide tangible benefits to the service process and the achievement of organizational goals (Mahendra & Widiyanto, 2025).

Research in Indonesia on technology system evaluation also shows that the performance, information, economics, control, efficiency, and service (PIECES) aspects can be used to assess the success of information systems and instructional technology. The results indicate that technology-based systems can provide convenience for users and support service needs, but there are still issues that require system development and improvement. This suggests that the quality and benefits of interactive modules need to be periodically evaluated to keep pace with evolving educational needs and contribute to improving competency (Dinata & Deharja, 2020).

Darussalam Health College (STIKes) Lhokseumawe is one of the leading healthcare educational institutions in Lhokseumawe City, Aceh, focusing on producing competent and competitive nursing graduates. Final-year students at Darussalam Health College (STIKes) Lhokseumawe are prepared to enter the workforce, which increasingly demands digital skills and international language proficiency. The complex challenges of the modern workplace require Darussalam Health College (STIKes) Lhokseumawe to continuously innovate clinical learning methods.



Competency development efforts at Darussalam Health College (STIKes) Lhokseumawe are implemented through strengthening laboratory simulation facilities and providing modern learning modules. The need to increase confidence in communicating in Medical English is a pressing issue, especially for final-year students who will soon face competency tests and the international workplace or international-scale healthcare facilities.

This need to improve communication skills is also relevant to various studies in local healthcare facilities in Aceh. Research on nurses' knowledge and compliance with quality indicators for treatment rooms indicates that service quality indicators need to be a priority in hospital service processes. Quality indicators are not only used to assess service outcomes but also serve as a basis for continuous control and improvement of work processes. This reinforces the importance of learning systems and modules capable of providing precise data and exercises to support competency indicator monitoring (Fauziah, 2023).

Although clinical simulations have been implemented, the integration of AI-based Medical English modules specifically into telehealth counseling scenarios is a novel approach that has not been extensively empirically evaluated in the region. The existence of language anxiety The effectiveness of AI tool integration in improving communication confidence among nursing students during virtual interactions requires empirical evidence.

Based on this description, there is a need to more specifically examine how the integration of AI modules impacts the communication confidence of nursing students. This research is important because the modern nursing world is characterized by complex services and various units that require rapid and accurate information exchange. Studying the relationship between AI technology integration and communication confidence can provide insight into the extent to which the technology supports the effectiveness, efficiency, accuracy, and quality of clinical interactions.

Therefore, the study "Integrating AI-Assisted Medical English Modules into Clinical Simulation: Impact on Nursing Students' Communication Confidence in Telehealth Settings" is crucial. This study aims to empirically demonstrate the effect of AI module integration on improving the communication confidence of nursing students at Darussalam Lhokseumawe Health College in telehealth settings. The results of this study are expected to not only provide insight into the use of AI but also serve as a reference for the development of an AI-based Nursing English curriculum in the future.

2. RESEARCH METHOD

This study employed a quantitative method with a quasi-experimental design, a pre-test versus post-test group design. This design was used to assess the impact of the integration of an AI-based Medical English module into a clinical simulation on the communication confidence levels of nursing students before and after the intervention. Measurements of the communication confidence variable were conducted on respondents in two stages (before and after the intervention). This approach allowed researchers to obtain a picture of significant differences in the level of confidence experienced by respondents after participating in the AI-based simulation.

The study was conducted at STIKes Darussalam Lhokseumawe in July 2026. The population was all final-year students of the Nursing Study Program at STIKes Darussalam Lhokseumawe enrolled in the current semester. The sampling technique used was total sampling (saturated), where all members of the population who met the criteria were selected as the sample, a total of 57 respondents. This total sampling technique was chosen because the population size was affordable and the study required a comprehensive picture of all final-year students ready to enter the workforce.

The inclusion criteria for this study included: (1) Active final-year students at Darussalam Lhokseumawe Health College; (2) Having completed basic English courses in Nursing and clinical nursing; (3) Having participated in all stages of the AI module intervention and telehealth simulation; and (4) Willingness to participate as respondents and signing informed consent. Exclusion criteria included respondents who were on leave or not actively studying at the time of the study, did not



complete the entire pre-test, intervention, or post-test series, and students who experienced direct medical obstacles during the intervention.

The research instrument was a Telehealth Communication Confidence Scale questionnaire adapted from a standard measure of medical communication habits in English. The questionnaire consisted of 20 items using a 4-point Likert scale (1 = Very Unconfident, 2 = Not Confident, 3 = Confident, 4 = Very Confident). This questionnaire covered aspects of fluency in medical English, the use of appropriate nursing terminology, digital empathy, and the ability to manage remote counseling virtually. Before being used in research, the research instrument had been tested for validity and reliability with a Cronbach's Alpha value > 0.80 , so it was declared very suitable and consistent for use. The research procedure begins with arranging a research permit from the management of STIKes Darussalam Lhokseumawe. After obtaining permission, researchers identified potential respondents based on predetermined inclusion and exclusion criteria. The researcher then provided an explanation to the respondents regarding the objectives, benefits, procedures, data confidentiality, and respondents' rights while participating in the research. Respondents who were willing to participate were asked to provide consent through informed consent. Next, the research procedure is divided into three main stages:

1. Pre-test stage: Respondents filled out an initial questionnaire to measure their level of confidence in Medical English communication in a basic telehealth scenario before being given the AI-based intervention.
2. Intervention Phase: Respondents took part in a clinical simulation learning program integrated with an AI module for 4 weeks in July 2026. In this intervention, students practiced distance counseling independently and guided using an AI conversational agent application developed specifically for nursing scenarios.
3. Post-test stage: After completing all AI-based simulation sessions, respondents fill out the same questionnaire again to measure changes in their level of self-confidence.

The data obtained was processed and analyzed using a computer statistical program. Data analysis consists of univariate and bivariate analysis. Univariate analysis was used to describe the characteristics of respondents, such as age and gender, as well as the frequency distribution of respondents' levels of self-confidence during the pre-test and post-test. Bivariate analysis was used to test the hypothesis of differences in mean self-confidence scores before and after intervention. Before carrying out bivariate analysis, the data was first tested for normality. After the normality assumption is met, hypothesis testing is carried out using the Paired Sample t-test with a statistical significance level (α) = 0.05. If a p value < 0.05 is obtained, it can be concluded that there is a significant influence from the integration of the AI-based Medical English module on nursing students' communication confidence.

3. RESULT AND DISCUSSION

Table 1. Respondent Characteristics by Age

Usia	Frequency (n)	Percentage (%)
<21 years	10	17,5
21–22 years	39	68,4
>22 years	8	14,1
Total	57	100



Based on Table 1, the majority of respondents were in the 21–22 age group, namely 39 people (68.4%). Furthermore, there were 10 respondents aged <21 years (17.5%), while 8 respondents aged >22 years (14.1%).

Table 2. Respondent Characteristics by Gender

Gender	Frequency (n)	Percentage (%)
Man	11	19,3
Woman	46	80,7
Total	57	100

Based on Table 2, the majority of respondents were female, namely 46 people (80.7%), while 11 respondents were male (19.3%).

Table 3. Distribution of Communication Self-Confidence Pre-test and Post-test

Self-Confidence Category	Pre-test (n)	Pre-test (%)	Post-test (n)	Post-test (%)
Good (Score 75–100)	5	8,8	42	73,7
Enough (Score 56–74)	21	36,8	12	21,1
Poor (Score <56)	31	54,4	3	5,2
Total	57	100	57	100

Based on Table 3, before the intervention (pre-test), most respondents had communication confidence in the poor category, namely 31 people (54.4%), the moderate category was 21 people (36.8%), and the good category was only 5 people (8.8%). However, after the AI-based simulation intervention (post-test), there was a significant increase where the majority of respondents were in the good category, namely 42 people (73.7%), the moderate category was 12 people (21.1%), and the poor category was drastically reduced to 3 people (5.2%).

Table 4. Results of the Paired Sample t-test of Communication Self-Confidence Pre-test and Post-test

Variabel	Mean	Standard Deviation	Average Difference	p-value
Pre-test	52,4	8,12	26,2	0,001
Post-test	78,6	6,45	-	-

Based on Table 4, the average value of respondents' communication self-confidence during the pre-test was 52.4 with a standard deviation of 8.12, while during the post-test it increased to 78.6 with a standard deviation of 6.45. The average difference between the pre-test and post-test was 26.2 with a p-value of 0.001 ($p < 0.05$), which indicates that there was a significant influence or increase in respondents' communication self-confidence after the intervention.

Integration of AI Modules in Telehealth Simulations

The implementation of artificial intelligence (AI) tools in Medical English training provides a personalized and responsive learning experience for nursing students. Research shows that AI-based interactive exercises allow students to repeat remote clinical conversation scenarios without fear of judgment, gradually building language proficiency and comfort. The integration of AI into telehealth



clinical simulations creates a richer and more realistic simulation flow, with the AI acting as an interactive interlocutor that can adjust the difficulty of the dialogue according to the student's abilities.

Improved Student Communication Confidence

The significant increase in the average self-confidence score from 52.4 to 78.6 confirms that the primary factor contributing to low confidence was a lack of interactive practice opportunities. Through AI-based telehealth simulations, students gained direct exposure to English medical terminology and real-life remote counseling situations. Students who previously struggled with constructing medical sentences in English became more familiar and responsive after engaging in structured simulation exercises.

Impact of the Intervention and Nursing Implications

The statistical test results ($p=0.001$) reinforce empirical evidence that AI technology is a highly effective medium for bridging linguistic theory and clinical simulation practice. This technology can be integrated into the nursing curriculum to enhance graduates' readiness to operate telehealth services and global health counseling. The practical implications of this study emphasize the importance of nursing educational institutions continuing to adopt AI-based digital technologies to strengthen graduates' competitiveness internationally.

4. CONCLUSION

Based on the results of a study on the effect of integrating an AI-based Medical English module into clinical simulations on the communication confidence of nursing students at Darussalam Lhokseumawe Health College, it can be concluded that:

1. Before the intervention, the majority of final-year students had poor (54.4%) Medical English communication confidence with an average score of 52.4.
2. After the AI module intervention in the telehealth simulation, the majority of students experienced an increase in confidence to good (73.7%) with an average score of 78.6.
3. There was a significant effect of integrating an AI-based Medical English module into clinical simulations on improving nursing students' communication confidence in telehealth services ($p=0.001 < 0.05$).

The use of AI tools in remote counseling simulations has proven effective in improving nursing students' English communication readiness and confidence. Therefore, optimizing AI-based modules through curriculum strengthening, technological resources, and structured training is expected to further improve the quality of nursing education institution graduates.

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