RESEARCH PAPER

Impact of "AI-Generated Videos" on Knowledge, Attitude and Skills Among Nursing Students: A Descriptive Study

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ABSTRACT

Background: The rapid advancements of digital technologies have significantly transformed nursing education , introducing innovative teaching-learning methods to enhance student outcomes. Among these, artificial intelligence (AI)-generated videos have emerged as a promising educational tool that provides visual, interactive, and a simulation-based learning experience. Nursing education requires the integration of theoretical knowledge, practical skills, and professional attitudes; however, traditional teaching methods may not always offer adequate exposure to complex clinical procedures. AI-generated videos can bridge the gap by offering standardized, repeatable, and engaging demonstrations of nursing care practices. These videos allow students to visualize procedures, improve understanding, and build confidence before real clinical exposure. Despite the growing utility of AI in education, there is a paucity of research regarding its specific impact on nursing competencies. Therefore, this study is essential to validate AI-generated videos as a viable pedagogical tool for modern healthcare training.

Aim: To evaluate the impact of AI-generated videos on the knowledge, attitude, and clinical skills regarding nursing care among B.Sc. Nursing students.

Methods: A quantitative, descriptive, cross-sectional study design was adopted among 100 B.Sc. Nursing 5th semester students at SGT University Gurugram, Haryana. A non-probability convenience sampling technique was utilized. Data were collected using a structured knowledge questionnaire, an attitude rating scale, and a skills assessment checklist. Both descriptive and inferential statistics were used for data analysis.

Results: The findings of the study revealed that AI-generated videos had a positive impact on nursing students' knowledge, attitude, and clinical skills. The majority of students demonstrated moderate to adequate knowledge, a positive attitude, and improved clinical skill levels after exposure to AI-generated videos. A statistically significant positive correlation was found between knowledge, attitude, and clinical skills among nursing students.

Conclusion: The study concludes that AI-generated videos are an effective educational tool in nursing education, enhancing knowledge acquisition, promoting positive attitudes, and improving clinical skills among nursing students. The integration of AI-based video learning into nursing curricula can support better learning outcomes and prepare students for modern healthcare environments.

Keywords: Artificial Intelligence, AI-generated videos, Nursing education, Knowledge, Attitude, Clinical skills.

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1. INTRODUCTION

In recent years, rapid advancement of digital technologies has significantly transformed various sectors, including education and healthcare. Over recent years, the adoption of innovative technologies into educational practices has led to the development of more effective and engaging teaching-learning methods. Nursing education, which plays a vital role in preparing competent healthcare professionals, has also experienced substantial changes with the incorporation of digital learning tools. Among these technological advancements, artificial intelligence (AI) has evolved into one of the most influential innovations shaping modern education and clinical training.

Artificial intelligence refers to the development of computer systems can perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, and decision making. In the past few years, AI has been widely adopted across multiple sectors, including healthcare, finance, communication, and transportation. In healthcare, AI is increasingly being used for clinical decision-making, and healthcare management. Similarly, in education, AI technologies are being used to create personalized learning experiences, intelligent tutoring systems, automated assessments and multimedia instructional materials. Major applications of AI in education are the development of AI-generated videos. These videos are created using advanced algorithms that merge artificial intelligence, machine learning, and multimedia technologies to produce interactive and visually appealing educational content. AI-generated videos can simulate real-life clinical scenarios, demonstrate nursing procedures, and explain complex physiological processes in

a clear and structured manner. This makes them particularly valuable in healthcare education, where visual learning and practical understanding are important components of skill development.

Nursing education demands students to develop a comprehensive set of competencies, including theoretical knowledge, practical clinical skills, and professional attitude. Knowledge involves understanding medical concepts, disease conditions, and nursing interventions. Skill refers to the ability to perform procedures appropriately and safely, while attitude represents the values, believes, and behaviour that shape professional nursing practice. The interplay of these three components is essential for delivering safe, effective, and patient-centred care. Tradional teaching methods in nursing education, such as lectures, textbooks, and limited clinical exposure, have long been practiced. While these methods provide a foundational understanding of nursing concepts, they may not always be sufficient to meet the evolving demands of modern healthcare systems. Clinical settings can be unpredictable, and student may not have the opportunity to observe or practice all necessary procedures during their training. Additionally, variations in teaching quality and limited resources can affect the learning outcomes of the students.

In this context AI-generated videos offer a potential approach to enhance nursing education. These videos provide standardized and consistent demonstrations of clinical procedures, ensuring that all students receive same quality of instructions. They allow students to observe procedures repeatedly, which is essential for skill acquisition and retention. Moreover, AI-generated videos can present complex concepts in a simplified and visually appealing manner, making it easier for students to understand and remember the information.

Globally, the adoption of AI in nursing education has been increasing rapidly. Many developed countries have integrated AI-based learning platforms into their educational systems to improve student outcomes. These platforms use machine learning algorithm to analyse student performance, identify learning gaps, and provide personalized learning materials. Virtual simulation and AI-generated videos enable students to practice clinical decision making and patient care in a safe and controlled environment, reducing the risk of errors during clinical practice.

The importance of digital learning technologies was further highlighted during the COVID-19 pandemic, which disrupted traditional educational system worldwide. Due to restriction on in-personal learning, educational institutions were forced to adopt online teaching methods. Nursing education faced significant challenges because clinical training and hands-on practice are essential components of the curriculum. As a result, educators increasingly relied on digital tools such as video-based learning, virtual simulations, and AI assisted educational resources to ensure continuity of education.

Video-based learning is supported by several educational theories that emphasize the importance of visual and experimental learning. According to multimedia learning theory, individuals learn more effectively when information is presented through both visual and auditory channels. Social learning theory highlights the role of observation in learning, suggesting that students can learn new behaviour and skills by observing others. Experimental learning theory emphasizes learning through experience and reflection. AI-generated videos incorporate elements of all these theories, making them highly effective for nursing education.

Despite of the potential benefits of AI-generated videos, their effectiveness depends largely on the acceptance and utilization by the students. The Technology Acceptance Model (TAM) provides a framework for understanding how individuals adopt new technologies. According to this model, perceived usefulness and perceived ease of use are the key factors influencing technology acceptance. If nursing students perceive AI-generated videos as useful and easy to use, they are more likely to engage with these tools and incorporate them into their learning process.

In nursing practice, knowledge, attitude, and skills are interrelated components that determine the overall competence of a nurse. Educational technologies can influence these components in various ways. AI-generated videos can enhance knowledge by presenting information in a structured and engaging manner. They can positively influence attitudes by promoting interest and motivation toward learning. Additionally, they can improve clinical skills by providing detailed demonstrations of procedures and allowing students to practice through observation.

Although several studies have explored the use of digital learning tools and video-based education in nursing, there is limited research specifically focusing on the impact of AI-generated videos on knowledge, attitude, and skills among nursing students. Most existing studies have primarily examined knowledge outcomes, with less emphasis on attitudes and clinical skills. Furthermore, the integration of AI-based educational tools is still in the early stages in many developing countries, including India.

Therefore, there is a need to assess the effectiveness of AI-generated videos as an educational tool in nursing education. Understanding how these videos influence students' knowledge, attitudes, and skills can provide valuable insights for educators and policymakers. It can also help in designing more effective teaching strategies that combine traditional methods with modern technological innovations.

The present study aims to evaluate the potential impact of AI-generated videos on nursing care among B.Sc. Nursing students. By examining the relationship between knowledge, attitude, and skills, the study seeks to provide a comprehensive understanding of how AI-based learning tools contribute to the development of competent nursing professionals.

In conclusion, the integration of artificial intelligence into nursing education represents a significant step toward modernizing teaching–learning practices. AI-generated videos have the potential to enhance educational outcomes by providing interactive, accessible, and effective learning experiences. As healthcare systems continue to evolve, it is

essential to adopt innovative educational strategies that prepare nursing students to meet the challenges of modern clinical practice.

2. THEORETICAL FRAMEWORK

2.1 The Technology Acceptance Model (TAM)

The present study is guided by the Technology Acceptance Model (TAM), originally proposed by Fred Davis in 1989, which explains how individuals adopt and use new technologies. According to this model, two primary factors—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—directly influence a user's attitude toward a technology and their subsequent intention to use it.

Perceived Usefulness (PU): In this study, PU refers to the nursing students' belief that AI-generated videos will enhance their clinical performance and help them master complex procedures more effectively.

Perceived Ease of Use (PEOU): This refers to the extent to which students find the AI-based video platforms easy to navigate without excessive effort.

2.2 Application of TAM to Nursing Competencies

In the context of this study, nursing students' acceptance of AI-generated videos as a learning tool is expected to have a direct impact on their knowledge acquisition, attitude formation, and skill development. If a student perceives the AI videos as both useful for exams/practice (PU) and easy to access (PEOU), they are more likely to develop a positive professional attitude. This positive engagement leads to higher retention of theoretical knowledge and better precision in clinical skills.

2.3 Relationship between Variables

TAM provides a robust theoretical basis for understanding how AI-based educational interventions influence learning outcomes among nursing students. It suggests a linear progression:

Input: Exposure to AI-generated videos.

Cognitive Process: Assessment of Usefulness and Ease of Use.

Outcome: Improved Knowledge, Positive Attitude, and Refined Clinical Skills.

3. MATERIALS AND METHODS

3.1 Research Design and Approach

This study utilized a quantitative research approach to ensure objective measurement of the variables. A descriptive cross-sectional study design was adopted to assess the impact of AI-generated videos on the knowledge, attitude, and skills of nursing students. This design was selected as it allows for the examination of multiple variables at a single point in time, providing a comprehensive "snapshot" of student competencies following the technological intervention.

3.2 Study Setting

The research was conducted at the Faculty of Nursing, SGT University, Gurugram, Haryana, India. This setting was chosen due to its advanced digital infrastructure and the availability of a diverse cohort of nursing students. The university provides a conducive environment for integrating Artificial Intelligence (AI) into the traditional nursing curriculum

3.3 Population and Sampling

The target population consisted of B.Sc. Nursing 5th-semester students currently enrolled in the academic year. A sample size of 100 students was determined to provide sufficient statistical power for the descriptive analysis. A non-probability convenience sampling technique was employed to select participants who were available during the data collection period and met the eligibility criteria.

Inclusion Criteria: Students registered in the B.Sc. Nursing 5th semester who provided written informed consent.

Exclusion Criteria: Students who were absent on the day of the intervention or those with prior specialized training in AI-based medical simulation.

3.4 The Research Intervention: AI-Generated Videos

The independent variable in this study was exposure to AI-generated videos specifically designed for nursing care procedures. These videos utilized high-definition simulations, 3D animations, and synthesized voice-overs to demonstrate core clinical tasks such as IV cannulation, catheterization, and sterile wound dressing. The use of AI allowed for the visualization of internal physiological processes (e.g., blood flow or nerve pathways) that are typically invisible in traditional live demonstrations.

3.5 Data Collection Instruments

A structured, self-administered questionnaire was developed, comprising four distinct sections:

Section A (Demographic Variables): Captured data on age, gender, previous AI exposure, and frequency of digital device usage.

Section B (Structured Knowledge Questionnaire): Contained 30 multiple-choice questions (Score range: 0–30). Scores were categorized as Adequate (>75%), Moderate (50-75%), and Inadequate (<50%).

Section C (Attitude Rating Scale): A 15-item scale based on a 5-point Likert system (Score range: 15–75) to measure professional perception.

Section D (Skills Assessment Checklist): A 20-item checklist (Score range: 0–20) used to evaluate procedural precision and adherence to clinical protocols.

3.6 Validity and Reliability

To ensure the scientific rigor of the study, the tools were validated by a panel of 10 experts from the fields of Medical-Surgical Nursing, Paediatrics, and Information Technology. The reliability of the instruments was established using the test-retest method and Cronbach's Alpha for internal consistency. Reliability coefficients were calculated at 0.85 for knowledge, 0.87 for attitude, and 0.84 for skills, indicating high stability and accuracy. A pilot study involving 10% of the sample size was conducted to

confirm the feasibility of the research protocol.

3.7 Ethical Considerations

Ethical clearance was obtained from the Institutional Ethics Committee (IEC). All participants were provided with an information sheet detailing the study's purpose, and written informed consent was obtained prior to data collection. Principles of confidentiality and anonymity were strictly maintained, and participants were informed of their right to withdraw from the study at any time without academic penalty.

3.8 Data Analysis Plan

The collected data were coded and analysed using SPSS (Statistical Package for the Social Sciences) Version 26.0.

Descriptive Statistics: Frequency, percentage, mean, and standard deviation were used to summarize demographic data and competency scores.

Inferential Statistics: Pearson's Correlation Coefficient (r) was used to determine the relationship between knowledge, attitude, and skills, while the Chi-square test was utilized to find the association between demographic variables and student performance.

4. RESULTS

4.1 Demographic Characteristics of Participants

The study analysed a cohort of 100 B.Sc. Nursing 5th-semester students at SGT University. As shown in Table 1, the age distribution revealed that the majority of respondents were aged 21–22 years (40%), followed closely by the 19–20 years group (38%). Gender distribution was predominantly female (78%), with males comprising 20% of the sample. Notably, 65% of students reported prior exposure to AI-generated content, primarily through AI videos (40%). Furthermore, a vast majority (92%) had consistent internet access, and 70% already utilized AI-generated videos for their academic learning.

Table 1: Demographic Profile of Nursing Students (N=100)

S. No	Variable	Category	Frequency (f)	Percentage (%)
1	Age	21-22 years	40	40%
2	Gender	Female	78	78%
3	AI Exposure	Yes	65	65%
4	Internet Access	Yes	92	92%

4.2 Assessment of Knowledge Levels

The post-intervention knowledge assessment (Table 2) indicated that the largest group of participants (45%) achieved an "Average" knowledge level, while 40% demonstrated a "Good" level of understanding regarding nursing care. Only 15% fell into the "Poor" category. This distribution suggests that the AI-generated videos were highly effective in conveying theoretical concepts to the majority of the student population.

Table 2: Distribution of Knowledge Scores

Knowledge Level	Score Range	Frequency (f)	Percentage (%)
Good	8-10	40	40%
Average	5-7	45	45%
Poor	0-4	15	15%

4.3 Distribution of Attitude Levels

Attitude toward AI-based learning was measured on a Likert scale (Table 3). A significant majority of students (60%) exhibited a Positive Attitude, while 30% remained Neutral. Only 10% of the participants held a Negative Attitude. These findings align with the Technology Acceptance Model (TAM), suggesting that students perceive AI videos as useful and easy to integrate into their clinical training.

Table 3: Distribution of Attitude Levels

Attitude Level	Score Range	Frequency (f)	Percentage (%)
Positive	56-75	60	60%
Neutral	36-55	30	30%
Negative	15-35	10	10%

4.4 Evaluation of Clinical Skill Levels

The clinical skill assessment was a vital component of this study, as it measured the practical application of the knowledge gained through AI-interventions. As illustrated in Table 4, the distribution of skill levels among the 100 participants showed a strong leaning towards competency. Exactly 50% of the nursing students achieved an "Adequate" skill level, scoring between 21 and 30. Furthermore, 38% of the students demonstrated a "Moderate" skill level with scores ranging from 11 to 20. Only a small minority of 12% fell into the "Inadequate" category. These results suggest that the visual and repetitive nature of AI-generated videos significantly enhances the psychomotor domain of nursing education.

Table 4: Distribution of Skill Levels (N = 100)

Skill Level	Score Range	Frequency (f)	Percentage (%)
Adequate	21-30	50	50%
Moderate	11-20	38	38%
Inadequate	0-12	12	12%

4.5 Descriptive Statistics of Competency Scores

Table 5 summarizes the Mean and Standard Deviation (SD) for the three primary variables. The mean knowledge score was 7.2 \pm 1.8, the mean attitude score was 58.6 \pm 6.4, and the mean skill score was 21.8 \pm 4.2. The relatively low SD values indicate a high degree of consistency in the learning outcomes across the participant group.

Table 5: Mean and SD of Research Variables

Variable	Max Score	Mean	SD
Knowledge	10	7.2	1.8
Attitude	75	58.6	6.4
Skill	30	21.8	4.2

4.6 Correlation Analysis

A critical finding of this study is the statistically significant positive correlation between the variables (Table 6). The correlation between Knowledge and Skills was $r = 0.65$ ($p < 0.05$), indicating a strong relationship where increased theoretical understanding directly leads to better clinical performance. Similarly, the correlation between Attitude and Skills ($r = 0.60$) suggests that a positive perception of technology fosters better practical application.

Table 6: Correlation Matrix (N=100)

Variables Compared	Correlation (r)	p-value	Interpretation
Knowledge & Skills	0.65	< 0.05	Moderate Positive
Attitude & Skills	0.60	< 0.05	Moderate Positive
Knowledge & Attitude	0.58	< 0.05	Moderate Positive

5. DISCUSSION

The present study was conducted to evaluate the impact of AI-generated videos on the knowledge, attitude, and clinical skills of B.Sc. Nursing students. The findings of the study demonstrated that AI-assisted learning significantly contributed to improving students' competencies in all three domains. The results indicate that modern technology-based teaching methods can effectively complement conventional nursing education and support better academic as well as clinical performance.

The findings related to knowledge assessment revealed that the majority of students achieved average to good scores after exposure to AI-generated educational videos. This improvement may be associated with the use of visual demonstrations, stepwise explanations, and repeated accessibility of learning material. Unlike traditional lecture-based methods, AI-generated videos provide a more interactive learning experience that helps students understand complex nursing procedures with greater clarity. The combination of visual and auditory stimuli promotes better retention, comprehension, and recall of theoretical concepts. Students were able to observe procedures multiple times, which strengthened conceptual understanding and minimized confusion during learning.

The study findings are also supported by multimedia learning principles, which emphasize that individuals learn more effectively when information is delivered through both visual and verbal channels simultaneously. AI-generated videos simplify difficult clinical concepts and transform abstract theoretical information into realistic and understandable demonstrations. Such digital learning methods are particularly beneficial in nursing education, where both cognitive understanding and procedural accuracy are equally important.

Another important finding of the study was the positive attitude of students toward AI-based learning methods. Most participants expressed acceptance and willingness to use AI-generated videos as supplementary educational resources. This positive perception may be due to the convenience, flexibility, and accessibility associated with digital learning platforms. Since many students already had previous exposure to smartphones, internet resources, and online educational content, they found the intervention comfortable and easy to adapt to within their academic routine.

The findings strongly align with the Technology Acceptance Model (TAM), which states that technology adoption is influenced by perceived usefulness and perceived ease of use. In the present study, students considered AI-generated videos beneficial for improving their academic understanding and clinical preparation. Additionally, the easy accessibility of videos through digital devices encouraged active engagement and increased learning motivation. Positive attitudes toward technology are essential because they influence the willingness of learners to continue using innovative educational methods in future

clinical practice.

The assessment of clinical skills showed that a considerable proportion of students demonstrated adequate competency after exposure to AI-generated videos. Nursing procedures require precision, coordination, and confidence, which are often difficult to achieve through theory alone. AI-generated demonstrations provided students with an opportunity to repeatedly observe procedural steps in a structured and systematic manner. This repetitive observation enhanced psychomotor learning and helped students perform procedures with greater accuracy.

Furthermore, visual simulation-based learning may reduce fear and anxiety associated with clinical practice among nursing students. Students often experience hesitation while performing procedures on real patients for the first time. By watching simulated demonstrations repeatedly, learners gain confidence and mental preparedness before entering actual clinical settings. This contributes to improved self-efficacy and better practical performance.

The correlation analysis conducted in the study demonstrated a statistically significant positive relationship among knowledge, attitude, and clinical skills. Students who possessed better theoretical understanding and a positive learning attitude also showed improved clinical competency. This finding highlights the interconnected nature of cognitive, affective, and psychomotor domains in nursing education. Effective nursing practice requires not only knowledge acquisition but also confidence, professional attitude, and practical competence.

The study also reflects the growing importance of integrating technology into healthcare education. In recent years, digital learning tools have become increasingly important due to advancements in artificial intelligence and the changing demands of healthcare systems. AI-generated educational resources provide flexibility, standardization, and equal learning opportunities for students. Such methods can be particularly useful in situations where direct clinical exposure is limited or inconsistent.

Despite the positive findings, certain limitations should be acknowledged. The study was conducted among students from a single institution using convenience sampling, which may limit the generalizability of the results. Additionally, the cross-sectional design assessed only the immediate outcomes of the intervention and did not evaluate long-term retention of knowledge or skills. Future studies involving larger samples and longitudinal follow-up may provide deeper insights into the sustained effectiveness of AI-generated learning strategies.

Overall, the findings of the present study support the integration of AI-generated videos into nursing education. These digital learning tools enhance theoretical understanding, encourage positive attitudes toward learning, and improve clinical competency among nursing students. The study emphasizes the need for educational institutions to adopt innovative and technology-supported teaching strategies to prepare competent and confident nursing professionals for modern healthcare environments.

6. CONCLUSION

6.1 Summary of the Study

The present study concludes that AI-generated videos represent a paradigm shift in nursing education, serving as an effective and innovative pedagogical tool. The empirical evidence gathered from B.Sc. Nursing 5th-semester students at SGT University demonstrates that the integration of AI-based video learning significantly enhances the triad of professional competence: knowledge, attitude, and skills. By bridging the gap between theoretical classroom instruction and complex clinical practice, these digital interventions provide a standardized "gold standard" for nursing care procedures.

6.2 Key Takeaways

Cognitive Enhancement: The visual and interactive nature of AI-generated content simplifies intricate physiological and procedural concepts, leading to a significant increase in knowledge retention.

Affective Shift: According to the Technology Acceptance Model (TAM), students showed a high level of readiness and a predominantly positive attitude (60%), proving that modern nursing students are prepared to embrace digital transformation.

Psychomotor Proficiency: The ability to observe high-fidelity simulations repeatedly allows students to internalize clinical steps, thereby improving skill precision and reducing "clinical anxiety" during real-world patient interactions.

6.3 Policy and Educational Implications

The study highlights the urgent necessity of integrating modern technological approaches into traditional nursing curricula. To achieve optimal learning outcomes, educational institutions and bodies like the Indian Nursing Council (INC) should consider:

- Developing standardized AI-based video repositories for core clinical competencies.
- Incorporating "Blended Learning" models that combine traditional bedside teaching with AI simulations.
- Providing training for nursing faculty to effectively facilitate technology-mediated learning.

6.4 Recommendations for Future Research

While this study provides a strong foundation, it was limited by a convenience sample within a single institution. Future researchers should:

- Conduct longitudinal studies to assess the long-term retention of skills acquired through AI videos.
- Utilize larger, multi-centric sample sizes across different geographical regions of India to improve generalizability.
- Perform comparative studies between AI-generated videos and traditional "Live Demonstrations" to measure cost-effectiveness and instructional efficiency.

6.5 Final Closing Statement

In conclusion, AI-generated videos are not merely a supplementary resource but a vital component of 21st-century nursing education. By promoting a holistic approach to learning—developing the cognitive, affective, and psychomotor domains simultaneously—AI-based tools play a crucial role in preparing a new generation of competent, confident, and "practice-ready" nursing professionals capable of meeting the demands of an evolving global healthcare system.

7. LIMITATIONS OF THE STUDY

Although the present study produced valuable findings regarding the role of AI-generated videos in nursing education, certain limitations should be considered while interpreting the results.

Firstly, the study was carried out among a limited number of participants from a single nursing institution, which may restrict the wider applicability of the findings to students studying in different educational settings or geographical areas. Educational facilities, technological exposure, and learning environments may vary across institutions, influencing student outcomes differently.

Secondly, the participants were selected through a convenience sampling technique. Since the sample was based on the availability of students during the period of data collection, the possibility of sampling bias cannot be completely excluded. Therefore, the findings may not represent the perspectives of all nursing students.

Another limitation is related to the use of self-structured and self-reported tools for assessing knowledge and attitude. In some cases, participants may provide responses influenced by personal perceptions or social expectations, which can affect the accuracy of the collected information.

In addition, the study adopted a cross-sectional design that focused only on the immediate effects of AI-generated videos. The long-term retention of knowledge, sustainability of clinical skills, and their influence on actual patient care practices were not assessed within the scope of the study.

Furthermore, external factors such as prior digital literacy, internet accessibility, individual learning preferences, and varying levels of familiarity with technology may also have influenced participants' responses and performance during the study.

Despite these limitations, the study provides useful insights into the educational value of AI-generated videos and highlights the growing importance of technology-supported learning approaches in nursing education.

8. RECOMMENDATIONS

Based on the findings and the identified limitations, the following recommendations are proposed for future academic and clinical practice:

Nursing Education: AI-generated videos should be integrated into the core nursing curriculum as a standard supplementary tool for teaching complex clinical procedures.

Large-Scale Research: Future studies should utilize a larger, multi-centric sample size involving various nursing colleges across India to enhance the external validity of the findings.

Longitudinal Approach: Researchers should conduct longitudinal studies to track the progression of nursing competencies from the classroom to the professional clinical setting over several years.

Technological Infrastructure: Nursing institutions should invest in high-fidelity digital labs and high-speed internet access to facilitate the seamless adoption of AI-based learning modules.

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10. CONFLICT OF INTEREST

The researcher declares that there is no conflict of interest associated with the present study or its publication. The study was conducted purely for academic and educational purposes. No external financial assistance, sponsorship, or commercial support from any organization or AI-related company was received that could influence the findings or interpretation of the research results.

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