Genius Journal of Medical Surgical Nursing
An International Peer-Reviewed Journal
Published by Genius Publishing
https://geniusjournal.net/
geniusjournalmsn@gmail.com

E-ISSN: 3125-0122 (Online)
Volume 1, Issue 2, 2026, pp. 35–43
https://doi.org/10.66763/gjmsn.v1i2.41

ORIGINAL ARTICLE

Effectiveness of Animated Splinting Video Media in Improving Clinical Self-Confidence Among Nurse Anesthesiology Students: A Quasi-Experimental Study

Ahmad Syawlan Alfajri[1], Ellyda Septiani Pramita[2], Astika Nur Rohmah[3]

[1] Universitas 'Aisyiyah Yogyakarta, Indonesia
[2] Universitas 'Aisyiyah Yogyakarta, Indonesia
[3] Universitas 'Aisyiyah Yogyakarta, Indonesia

ARTICLE INFORMATION

Article history:
Received: 2026-07-04
Revised : 2026-07-21
Accepted: 2026-07-30

Keywords:
Animated video; clinical self-confidence; nurse anesthesia students; nursing education; splinting and bandaging

Corresponding Author:

Ahmad Syawlan Alfajri Universitas 'Aisyiyah Yogyakarta
ahmadsaulan21@gmail.com

How to cite:
Alfajri, A. S., Pramita, E. S., & Rohmah, A. N. (2026). Effectiveness of Animated Splinting Video Media in Improving Clinical Self-Confidence Among Nurse Anesthesiology Students: A Quasi-Experimental Study. *Genius Journal of Medical Surgical Nursing*, 1(2), 35–43. https://doi.org/10.66763/gjmsn.v1i2.41

ABSTRACT

Background: Clinical self-confidence is essential for nurse anesthesia students when performing emergency procedures such as splinting and bandaging. Animated videos may improve procedural understanding and psychological readiness by providing clear, standardized, and repeatable visual demonstrations.

Objectives: To evaluate the effectiveness of an animated splinting video in improving clinical self-confidence among nurse anesthesia students.

Methods: This quasi-experimental study used a pretest–posttest control-group design involving 70 undergraduate nurse anesthesia students at Universitas 'Aisyiyah Yogyakarta, Indonesia. Participants were assigned to an intervention group (n = 35) and a control group (n = 35). The intervention group viewed an animated video presenting the purposes, principles, indications, safety considerations, and procedural steps of splinting and bandaging, whereas the control group received no intervention. Clinical self-confidence was measured using a validated 20-item questionnaire. Data were analyzed using the Wilcoxon signed-rank test and Mann–Whitney U test.

Results: Before the intervention, 68.6% of students in the intervention group and 85.7% in the control group had low clinical self-confidence. After the intervention, 62.9% of students in the intervention group had very high confidence and 37.1% had high confidence. The intervention group demonstrated a significant pretest–posttest improvement ($p < 0.001$), whereas no significant change occurred in the control group (p = 0.482). Posttest confidence was significantly higher in the intervention group than in the control group, with mean ranks of 52.91 and 18.09, respectively ($Z = -7.168$, $p < 0.001$).

Conclusions: The animated splinting video effectively improved clinical self-confidence among nurse anesthesia students. It may be used as a supplementary learning resource before simulation, laboratory practice, and supervised clinical training.

Introduction

Nursing education integrates theoretical knowledge, psychomotor skills, clinical judgment, communication, and patient-safety principles to prepare students for professional practice (Cant & Cooper, 2017; Foronda et al., 2013). In nurse anesthesia education, clinical learning occurs in complex environments that require students to connect theoretical knowledge with perioperative and emergency-care competencies. Clearly communicated expectations, supportive supervision, preparation before clinical placement, and constructive feedback have been identified as important facilitators of student nurse anesthetists' learning in the operating room (Hedlund et al., 2024). Self-directed and repeated clinical learning activities may also strengthen nursing students' confidence, perceived competence, and readiness for professional practice (Park & Cho, 2022; Platt et al., 2024).

Musculoskeletal injuries and fractures remain a major health burden worldwide. The Global Burden of Disease 2019 study estimated that approximately 178 million new fractures occurred globally in 2019, representing an increase of 33.4% compared with 1990 (GBD 2019 Fracture Collaborators, 2021). First-aid guidelines recommend protecting an injured limb through splinting and advise against straightening an angulated long-bone fracture in the first-aid setting. Appropriate splinting requires careful assessment, protection of the injured extremity, minimization of unnecessary movement, and continued observation of the patient's condition (Zideman et al., 2021). Consequently, students who may encounter trauma cases require adequate preparation before undertaking bandaging and splinting procedures.

Clinical self-confidence represents students' perceived belief that they can perform required clinical activities appropriately and effectively (Brocker & Scafide, 2024; Ramezanzade Tabriz et al., 2024). Higher self-confidence may encourage nursing students to participate in clinical activities, make clinical judgments, communicate with patients, and collaborate with healthcare teams (Alrashidi et al., 2023). Conversely, insufficient confidence may be accompanied by hesitation and anxiety when students are expected to perform unfamiliar procedures (Labrague et al., 2019). Nevertheless, perceived confidence should not be regarded as equivalent to objectively demonstrated competence because confidence and skill performance do not always develop at the same level (Brocker & Scafide, 2024).

Structured learning experiences can strengthen students' confidence by allowing them to observe, practise, evaluate, and repeat clinical procedures in controlled environments (Hung et al., 2021; Kim et al., 2016). Simulation-based education has been associated with improvements in nursing students' perceived competence, self-efficacy, satisfaction, and self-confidence (Alrashidi et al., 2023; Hung et al., 2021). Supportive learning environments and well-designed simulation activities are also associated with greater student satisfaction and confidence (Bdiri Gabbouj et al., 2024; Moreno-Cámara et al., 2024). However, simulation-based instruction commonly requires trained facilitators, laboratory facilities, equipment, scheduling, and opportunities for repeated practice (Cant & Cooper, 2017).

Video-based learning provides students with access to standardized procedural demonstrations that can be reviewed repeatedly according to their individual learning needs. A systematic review and meta-analysis concluded that video is a beneficial supplementary method for teaching psychomotor nursing skills and may improve students' confidence and clinical performance (Clerkin et al., 2022). Video-assisted instruction has demonstrated beneficial effects on nursing students' intravenous catheter insertion skills and self-confidence compared with conventional demonstration alone (İsmailoğlu et al., 2020). Video-supported learning has also improved nursing students' knowledge, self-efficacy, and performance in advanced life support and range-of-motion exercises (Jang et al., 2021; Melikoğlu et al., 2025).

Animated instructional videos combine verbal explanations with visual representations of movement, equipment, positioning, and procedural sequences. The cognitive theory of multimedia learning explains that learning occurs through the coordinated processing of verbal and visual information within a working-memory system of limited capacity. Multimedia principles such as coherence, signalling, temporal contiguity, spatial contiguity, and segmentation

can help learners focus on essential information and manage complex instructional content (Mayer, 2024). In splinting education, animation can present limb positioning, splint placement, bandaging direction, fixation, safety precautions, and post-procedure assessment in an organized and repeatable format.

The effects of technology-assisted education may vary according to instructional design, content, learning duration, opportunities for repetition, and integration with active practice (Saidkhani et al., 2024; Wu et al., 2022). A comparative quasi-experimental study among nurse anesthesia students found that scenario-based and video-based training produced different outcomes in basic life-support knowledge and cardiopulmonary-resuscitation performance (Saidkhani et al., 2024). Differences have also been reported between simulation-based and video-enhanced interprofessional education in the learning outcomes of nursing and medical students (Wu et al., 2022). Therefore, animated videos should be considered supplementary preparatory resources rather than complete replacements for supervised demonstration, simulation, and direct skills practice.

Existing reviews have examined video instruction, simulation, psychomotor performance, and self-confidence across various nursing procedures (Alrashidi et al., 2023; Clerkin et al., 2022; Ramezanzade Tabriz et al., 2024). However, evidence specifically examining animated splinting videos and clinical self-confidence among nurse anesthesia students remains limited. A preliminary assessment involving 10 nurse anesthesia students at Universitas 'Aisyiyah Yogyakarta indicated that most students had not fully mastered the procedural steps of splinting and lacked confidence in performing the procedure on patients. Therefore, this study aimed to evaluate the effectiveness of an animated splinting video in improving clinical self-confidence among nurse anesthesia students using a quasi-experimental pretest–posttest control-group design.

Methods

This study used a quantitative quasi-experimental design with a pretest–posttest control group. It was conducted among undergraduate nurse anesthesia students at Universitas 'Aisyiyah Yogyakarta, Indonesia, in 2026. The intervention group received an animated video on splinting and bandaging, whereas the control group did not receive the intervention. Clinical self-confidence was measured before and after the intervention in both groups.

The study population consisted of 235 students enrolled in the 2025 cohort of the Undergraduate Applied Nurse Anesthesia Program. Participants were recruited using probability sampling with a stratified sampling approach based on the existing class groups. The final sample included 70 students, comprising 35 participants in the intervention group and 35 participants in the control group. Students were eligible when they were enrolled in the 2025 cohort, had not received formal instruction or practical training in splinting and bandaging, and provided written informed consent. Students who were absent during data collection, declined participation, or were on academic leave were excluded.

The educational intervention consisted of an animated video presenting the purposes, principles, indications, safety considerations, and sequential procedures of splinting and bandaging. The video was designed to provide a clear and repeatable visual demonstration before students undertook direct clinical practice. Its content, procedural accuracy, audio, visual presentation, and usability were reviewed by an expert in nurse anesthesia education. The video was considered suitable for use after revisions were made according to the expert's recommendations.

Clinical self-confidence was measured using a 20-item questionnaire adapted from Khoiri et al. (2024). The instrument assessed students' confidence in recognizing fractures and bleeding, determining priorities, selecting appropriate interventions, performing splinting procedures, maintaining patient comfort, communicating with patients and families, identifying potential complications, collaborating with healthcare professionals, positioning patients, making clinical decisions, adapting to changing situations, and evaluating the effectiveness of splinting. Each item

was scored on a four-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*), producing a total score of 20–80. Scores were categorized as very low (<20), low (21–40), high (41–60), or very high (61–80). Previous testing showed that all 20 items were valid, with item correlation coefficients exceeding 0.349, and the instrument demonstrated excellent internal consistency with a Cronbach's alpha of 0.951.

Before data collection, eligible students received information about the study objectives, procedures, voluntary nature of participation, potential benefits, and confidentiality protections. Students who agreed to participate provided written informed consent. Both groups completed the clinical self-confidence questionnaire as a pretest. The intervention group then viewed the animated splinting and bandaging video, while the control group received no educational intervention. Afterward, both groups completed the same questionnaire as a posttest. Completed questionnaires were checked for completeness before data entry.

Data were analyzed using IBM SPSS Statistics version 24. Participant characteristics and clinical self-confidence categories were summarized using frequencies and percentages. The Wilcoxon signed-rank test was used to evaluate differences between pretest and posttest scores within each group. The Mann–Whitney U test was used to compare posttest clinical self-confidence between the intervention and control groups. All statistical tests were two-tailed, and statistical significance was established at $p < 0.05$.

Ethical approval was obtained from the Health Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta under approval number 2267/KEP-UNISA/II/2026. Participation was voluntary, and students were informed that they could withdraw at any time without academic consequences. Participant anonymity was protected through identification codes, and all collected data were maintained confidentially.

Results

A total of 70 nurse anesthesia students completed the study, comprising 35 participants in the intervention group and 35 in the control group. In the intervention group, most participants were female (57.1%) and had no previous experience related to splinting and bandaging (68.6%). Similarly, most participants in the control group were female (68.6%) and had no previous splinting and bandaging experience (82.9%).

Table 1: Characteristics of participants

Characteristic	Category	Intervention		Control	
		n	%	n	%
Sex	Male	15	42.9	11	31.4
	Female	20	57.1	24	68.6
Previous splinting experience	Yes	11	31.4	6	17.1
	No	24	68.6	29	82.9
Total		**35**	**100.0**	**35**	**100.0**

Before the intervention, most participants in both groups had low clinical self-confidence. In the intervention group, 24 participants (68.6%) had low clinical self-confidence and 11 (31.4%) had high clinical self-confidence. In the control group, 30 participants (85.7%) had low clinical self-confidence and five (14.3%) had high clinical self-confidence. No participants in either group were categorized as having very low or very high clinical self-confidence at baseline.

After the animated video intervention, all participants in the intervention group moved into the high or very-high clinical self-confidence categories. Thirteen participants (37.1%) had high clinical self-confidence, while 22 (62.9%) had very high clinical self-confidence. In contrast, the distribution in the control group remained unchanged, with 30 participants (85.7%) in the low category and five (14.3%) in the high category.

Table 2: Distribution and within-group differences in clinical self-confidence before and after the intervention

Group	Measurement	Very low		Low		High		Very high		Total		*p*-value
		n	%	n	%	n	%	n	%	n	%	
Intervention	Pretest	0	0.0	24	68.6	11	31.4	0	0.0	35	100.0	<0.001
	Posttest	0	0.0	0	0.0	13	37.1	22	62.9	35	100.0	
Control	Pretest	0	0.0	30	85.7	5	14.3	0	0.0	35	100.0	0.482
	Posttest	0	0.0	30	85.7	5	14.3	0	0.0	35	100.0	

Note. Within-group differences were examined using the Wilcoxon signed-rank test. Values reported as 0.000 in the statistical output are presented as p < 0.001.

The Wilcoxon signed-rank test showed a statistically significant difference between pretest and posttest clinical self-confidence in the intervention group ($p < 0.001$). In contrast, no statistically significant difference was observed between the pretest and posttest results in the control group ($p = 0.482$).

The Mann–Whitney U test showed that the intervention group had a higher posttest mean rank than the control group (52.91 vs 18.09). The difference in posttest clinical self-confidence between the groups was statistically significant ($Z = -7.168$, $p < 0.001$). These results indicate that students who received the animated splinting video had higher postintervention clinical self-confidence than students in the control group.

Table 3: Difference in posttest clinical self-confidence between the intervention and control groups

Outcome	Intervention mean rank	Control mean rank	*Z*	*p*-value
Posttest clinical self-confidence	52.91	18.09	−7.168	<0.001

Note. Between-group differences were analyzed using the Mann–Whitney U test. Statistical significance was established at p < 0.05.

Discussion

This study demonstrated that the animated splinting video significantly improved clinical self-confidence among nurse anesthesia students. In the intervention group, most students initially had low clinical self-confidence, whereas after the intervention all participants moved into the high or very-high categories. The Wilcoxon signed-rank test confirmed a significant pretest–posttest improvement in the intervention group ($p < 0.001$), while no significant change occurred in the control group ($p = 0.482$). The Mann–Whitney U test also showed significantly higher posttest clinical self-confidence in the intervention group than in the control group, with mean ranks of 52.91 and 18.09, respectively ($Z = -7.168$, $p < 0.001$).

The low baseline confidence observed in both groups may be related to the participants' limited previous exposure to splinting and bandaging procedures. Most students in the intervention and control groups reported no previous experience with splinting, indicating that they had few opportunities to develop familiarity with the procedure before the study. Limited mastery experience can reduce students' belief in their ability to perform unfamiliar clinical tasks effectively (Kleppang et al., 2023). Clinical self-confidence generally develops through repeated learning, successful practice, observation, feedback, and opportunities to apply knowledge in realistic situations (Ramezanzade Tabriz et al., 2024). Nursing students with insufficient practical exposure may therefore understand basic concepts but remain hesitant when required to perform procedural skills independently (Alrashidi et al., 2023).

The substantial improvement after the intervention is consistent with previous evidence regarding video-supported nursing education. Clerkin et al. (2022) found that video-based instruction supported psychomotor learning and improved nursing students' confidence in performing clinical procedures. Video-assisted instruction has also been shown to improve self-confidence and performance in intravenous catheter insertion compared with conventional demonstration methods (İsmailoğlu et al., 2020). Similarly, Jang et al. (2021) reported that repeated self-learning using instructional videos improved nursing students' knowledge, self-efficacy, and advanced life-support performance. These findings support the present results by indicating that repeated visual exposure can strengthen students' perceived readiness to perform procedural clinical tasks.

Animated video may improve confidence by providing a structured visual representation of each procedural stage. Multimedia learning is more effective when verbal explanations and relevant visual information are presented in an integrated and organized manner. Animation can demonstrate limb positioning, equipment placement, bandaging direction, splint fixation, and safety precautions more clearly than written explanations alone. Segmenting the procedure into manageable stages may also help students process complex information without excessive cognitive load (Mayer, 2024). The ability to observe a standardized demonstration may have helped participants form a clearer mental representation of splinting and reduced uncertainty regarding how the procedure should be performed.

The repeatability of the intervention may also have contributed to the improvement in clinical self-confidence. Video-based learning allows students to pause, review, and repeat difficult procedural steps according to their individual learning needs (Clerkin et al., 2022). Repeated observation can reinforce procedural memory and increase familiarity before students participate in laboratory or clinical practice (Jang et al., 2021). Melikoğlu et al. (2025) similarly found that video-assisted instruction improved nursing students' practical performance and reduced anxiety during range-of-motion exercises. Reduced uncertainty and greater procedural familiarity may therefore explain why participants in the intervention group reported stronger confidence after viewing the animated splinting video.

The absence of change in the control group suggests that clinical self-confidence was unlikely to improve without a structured educational experience during the study period. Students in the control group remained predominantly in the low-confidence category at both measurement points. Saidkhani et al. (2024) reported that instructional approaches involving scenarios or video produced better learning outcomes among nurse anesthesia students than the absence of comparable active educational exposure. Simulation research has also shown that confidence improves when students receive organized learning activities, realistic procedural experiences, and supportive feedback (Alrashidi et al., 2023; Bdiri Gabbouj et al., 2024). These findings indicate that intentional educational interventions are needed to strengthen students' readiness for unfamiliar clinical procedures.

Although the animated video was effective in improving perceived clinical self-confidence, confidence should not be interpreted as direct evidence of clinical competence. Self-confidence reflects students' perceptions of their ability, whereas competence requires objective demonstration of procedural accuracy, clinical judgment, communication, and patient-safety behavior (Brocker & Scafide, 2024). A student may report high confidence but still require supervision and corrective feedback during actual performance. Therefore, animated video should be used as preparatory learning before skills-laboratory practice, simulation, return demonstration, and supervised clinical training rather than as a replacement for direct practice.

The findings have practical relevance for nurse anesthesia education because splinting is a procedural skill that may be required in emergency and trauma-related care. Integrating animated videos into teaching may provide students with a standardized and accessible resource that can be reviewed before laboratory sessions. Video preparation may allow face-to-face learning time to focus more on hands-on practice, error correction, clinical reasoning, and instructor feedback. The combination of multimedia preparation and supervised simulation may provide stronger educational outcomes than either method alone (Cant & Cooper, 2017; Saidkhani et al., 2024).

The results should nevertheless be interpreted with consideration of the study design. Participants were drawn from a single institution, which may limit the applicability of the findings to students in other educational settings. Clinical self-confidence was assessed using a self-reported questionnaire and was not accompanied by an objective assessment of splinting performance. The study also evaluated the immediate postintervention outcome and did not determine whether the increase in confidence was sustained over time. Future studies should include multiple institutions, randomized group allocation, delayed follow-up assessments, and objective performance measures such as structured skills checklists or objective structured clinical examinations.

Implication and limitation

The findings support the use of animated splinting videos as supplementary learning resources in nurse anesthesia education because they can provide standardized, repeatable, and accessible procedural demonstrations before laboratory practice, simulation, or supervised clinical training; however, such videos should complement rather than replace direct demonstration, hands-on practice, instructor feedback, and objective competency assessment. The findings should be interpreted cautiously because the study was conducted at a single institution with a relatively small sample, used a quasi-experimental design, and measured clinical self-confidence through self-report rather than objective splinting performance. In addition, outcomes were assessed immediately after the intervention, so the long-term retention of confidence and skills remains unknown. Future multicentre randomized studies should include larger samples, objective clinical performance measures, and follow-up assessments to evaluate the sustainability of the intervention's effects.

Relevance for Practice

Animated splinting videos can be integrated into nurse anesthesia education as preparatory learning resources before laboratory demonstrations, simulation, and supervised clinical practice. Their standardized and repeatable presentation may help students understand procedural sequences, safety principles, and required equipment while strengthening confidence before performing splinting and bandaging. Educators should combine animated videos with hands-on practice, instructor feedback, and objective skills assessment to ensure that increased confidence is accompanied by accurate and safe clinical performance.

Conclusion

The animated splinting video was effective in improving clinical self-confidence among nurse anesthesia students. Students in the intervention group demonstrated a significant increase in confidence from pretest to posttest, whereas no significant change occurred in the control group, and posttest confidence was significantly higher in the intervention group ($p < 0.001$). These findings support the use of animated videos as supplementary preparatory media before laboratory practice, simulation, and supervised clinical training, while direct skills practice and objective competency assessment remain necessary to ensure safe and accurate performance.

Acknowledgment

The authors gratefully acknowledge Universitas 'Aisyiyah Yogyakarta for granting permission and facilitating the study. Appreciation is also extended to the faculty members and staff of the Nurse Anesthesia Program for their support during data collection and intervention implementation. The authors sincerely thank all participating students for their time, cooperation, and valuable contribution to this study.

Author Contribution

Ahmad Syawlan Alfajri contributed to the conceptualization, methodology, investigation, data collection, data curation, formal analysis, visualization, and preparation of the original manuscript draft. Ellyda Septiani Pramita contributed to the conceptualization, methodology, supervision, validation, interpretation of the findings, and critical revision of the manuscript. Astika Nur Rohmah contributed to the validation, interpretation of the findings, and critical review and editing of the manuscript. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Funding

This research received no external funding.

Declaration of Conflicting Interest

The authors declare no conflict of interest.

Declaration of Use of AI in Scientific Writing

The authors declare that generative AI and AI-assisted technologies were used to support language editing and grammatical refinement of the manuscript.

References

Alrashidi, N., Pasay-an, E., Alrashedi, M. S., Alqarni, A. S., Gonzales, F., Bassuni, E. M., Pangket, P., Estadilla, L., Benjamin, L. S., & Ahmed, K. E. (2023). Effects of simulation in improving the self-confidence of student nurses in clinical practice: A systematic review. *BMC Medical Education, 23*, 815. https://doi.org/10.1186/s12909-023-04793-1

Bdiri Gabbouj, S., Zedini, C., & Naija, W. (2024). Nursing students' satisfaction and self-confidence with simulation-based learning and its associations with simulation design characteristics and educational practices. *Advances in Medical Education and Practice, 15*, 1093–1102. https://doi.org/10.2147/AMEP.S477309

Brocker, A., & Scafide, K. N. (2024). Systematic review: Self-efficacy and skill performance. *International Nursing Review, 71*(4), 810–822. https://doi.org/10.1111/inr.12915

Cant, R. P., & Cooper, S. J. (2017). Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review. *Nurse Education Today, 49*, 63–71. https://doi.org/10.1016/j.nedt.2016.11.015

Clerkin, R., Patton, D., Moore, Z., Nugent, L., Avsar, P., & O'Connor, T. (2022). What is the impact of video as a teaching method on achieving psychomotor skills in nursing? A systematic review and meta-analysis. *Nurse Education Today, 111*, 105280. https://doi.org/10.1016/j.nedt.2022.105280

Foronda, C., Liu, S., & Bauman, E. B. (2013). Evaluation of simulation in undergraduate nurse education: An integrative review. *Clinical Simulation in Nursing, 9*(10), e409–e416. https://doi.org/10.1016/j.ecns.2012.11.003

GBD 2019 Fracture Collaborators. (2021). Global, regional, and national burden of bone fractures in 204 countries and territories, 1990–2019: A systematic analysis from the Global Burden of Disease Study 2019. *The Lancet Healthy Longevity, 2*(9), e580–e592. https://doi.org/10.1016/S2666-7568(21)00172-0

Hedlund, J., Blomberg, K., Hjelmqvist, H., & Jaensson, M. (2024). Student nurse anesthetists' and supervisors' perspectives of learning in the operating room: An integrative review. *Journal of PeriAnesthesia Nursing, 39*(2), 303–310.e8. https://doi.org/10.1016/j.japan.2023.07.023

Hung, C.-C., Kao, H.-F. S., Liu, H.-C., Liang, H.-F., Chu, T.-P., & Lee, B.-O. (2021). Effects of simulation-based learning on nursing students' perceived competence, self-efficacy, and learning satisfaction: A repeat measurement method. *Nurse Education Today, 97*, 104725. https://doi.org/10.1016/j.nedt.2020.104725

İsmailoğlu, E. G., Orkun, N., Eşer, İ., & Zaybak, A. (2020). Comparison of the effectiveness of the virtual simulator and video-assisted teaching on intravenous catheter insertion skills and self-confidence: A quasi-experimental study. *Nurse Education Today, 95*, 104596. https://doi.org/10.1016/j.nedt.2020.104596

Jang, K., Kim, S. H., Oh, J. Y., & Mun, J. Y. (2021). Effectiveness of self-re-learning using video recordings of advanced life support on nursing students' knowledge, self-efficacy, and skills performance. *BMC Nursing, 20*, 52. https://doi.org/10.1186/s12912-021-00573-8

Kim, J., Park, J.-H., & Shin, S. (2016). Effectiveness of simulation-based nursing education depending on fidelity: A meta-analysis. *BMC Medical Education, 16*, 152. https://doi.org/10.1186/s12909-016-0672-7

Labrague, L. J., McEnroe-Petitte, D. M., Bowling, A. M., Nwafor, C. E., & Tsaras, K. (2019). High-fidelity simulation and nursing students' anxiety and self-confidence: A systematic review. *Nursing Forum, 54*(3), 358–368. https://doi.org/10.1111/nuf.12337

Mayer, R. E. (2024). The past, present, and future of the cognitive theory of multimedia learning. *Educational Psychology Review, 36*, 8. https://doi.org/10.1007/s10648-023-09842-1

Melikoğlu, S. E., Demircan, B., & Kıyak Yorulmaz, Y. (2025). The effect of video-assisted teaching on nursing students' practice skills and anxiety levels in range-of-motion exercises: A randomized controlled study. *BMC Medical Education, 25*, 1134. https://doi.org/10.1186/s12909-025-07714-6

Moreno-Cámara, S., da-Silva-Domingues, H., Parra-Anguita, L., & Gutiérrez-Sánchez, B. (2024). Evaluating satisfaction and self-confidence among nursing students in clinical simulation learning. *Nursing Reports, 14*(2), 1037–1048. https://doi.org/10.3390/nursrep14020078

Park, H., & Cho, H. (2022). Effects of a self-directed clinical practicum on self-confidence and satisfaction with clinical practicum among South Korean nursing students: A mixed-methods study. *International Journal of Environmental Research and Public Health, 19*(9), 5231. https://doi.org/10.3390/ijerph19095231

Platt, A., Allan, J., Leader, C., Prescott-Clements, L., & McMeekin, P. (2024). Preparing for practice, the effects of repeated immersive simulation on the knowledge and self-efficacy of undergraduate nursing students: A mixed methods study. *Nurse Education in Practice, 74*, 103866. https://doi.org/10.1016/j.nepr.2023.103866

Ramezanzade Tabriz, E., Sadeghi, M., Tavana, E., Heidarian Miri, H., & Heshmati Nabavi, F. (2024). Approaches for boosting self-confidence of clinical nursing students: A systematic review and meta-analysis. *Heliyon, 10*(6), e27347. https://doi.org/10.1016/j.heliyon.2024.e27347

Saidkhani, V., Albooghobeish, M., Rahimpour, Z., & Haghighizadeh, M. H. (2024). The effect of scenario-based training versus video training on nurse anesthesia students' basic life support knowledge and skill of cardiopulmonary resuscitation: A quasi-experimental comparative study. *BMC Medical Education, 24*, 488. https://doi.org/10.1186/s12909-024-05490-3

Wu, J.-C., Chen, H.-W., Chiu, Y.-J., Chen, Y.-C., Kang, Y.-N., Hsu, Y.-T., O'Donnell, J. M., & Kuo, S.-Y. (2022). Comparison of simulation-based interprofessional education and video-enhanced interprofessional education in improving the learning outcomes of medical and nursing students: A quasi-experimental study. *Nurse Education Today, 118*, 105535. https://doi.org/10.1016/j.nedt.2022.105535

Zideman, D. A., Singletary, E. M., Borra, V., Cassan, P., Cimpoesu, C. D., De Buck, E., Djärv, T., Handley, A. J., Klaassen, B., Meyran, D., Oliver, E., & Poole, K. (2021). European Resuscitation Council Guidelines 2021: First aid. *Resuscitation, 161*, 270–290. https://doi.org/10.1016/j.resuscitation.2021.02.013