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# The effect of card game-style training on the clinical performance of anesthesia nursing students in decision-making for recovery

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## Abstract

This study investigated the effect of card game on the clinical performance of intelligence students in making decisions for recovery. The necessity of implementing this plan includes the novelty and vitality of the subject, more practice for students, optimal use of educational opportunities and training of clinical professionals. With the accurate and regular implementation of this plan, intelligence students are professionally trained in the clinical field. In this interventional study, students were included in the study by available sampling and randomly divided into intervention and control groups. In order to collect the data, a researcher-made clinical evaluation questionnaire was used. Data analysis was done through SPSS version 26 software and using descriptive and analytical statistics (t test).The results showed that there is a significant difference between the average post-test scores of the two groups. Therefore, it can be said that the students who were trained in the recovery section based on the method of playing cards performed better compared to the students who were trained using the traditional method. The results of this research recommend the use of playing card methods in integrated recovery training.

**Key words:** card game, recovery, students, intelligence

## Introduction

After surgery, patients are transferred to the post-anesthesia care unit (PACU) or recovery room (Abdollahi et al., 2011). At this stage, patients face variable conditions and issues such as pain, wound site bleeding, airway spasm, nausea and vomiting, feelings of cold and shivering, fluctuations in blood pressure and heart rate, among others (Strand EB et al., 2007). Appropriate interventions during this period play a decisive role in reducing harm to surgical patients (Pogatzki-Zahn EM et al., 2017), indicating that each patient requires specific and individualized measures. Anesthesia nursing staff and students are the first responders at the bedside when complications arise in these patients and play a pivotal and vital role in their care. If their roles are not performed effectively, patients may suffer physical, financial, and even life-threatening consequences (Xu X et al., 2017).

The clinical environment is of high importance in the training process of medical and health science professions (Norozi V et al., 2021). However, it is often challenging to control this environment (Spreen AE, Schuurmans MJ, 2011), as it can simultaneously foster learning while also potentially supporting, inhibiting, or limiting students' learning opportunities (Taal L, Faber A, 1997). Issues such as a stressful environment, lack of welfare and educational facilities (Boyer NL et al., 2016), inconsistencies between student and patient numbers, poor communication from physicians, staff, and other personnel, limited time for interventions (Alvarez GF, Kirby AS, 2006), and lack of sufficient experience can induce fear, anxiety, and insufficient learning in students. Altogether, these lead to anesthesia nursing students graduating with inadequate clinical skills, resulting in decreased student confidence, and as noted above, ultimately harming patients and the healthcare system (Gasteratos K et al., 2022). Indeed, a study among nursing students reported both theoretical and practical deficiencies in their knowledge and performance (Nolan S, Murphy J, 2006). One strategy to bridge the gap between education and clinical practice is the shift from a traditional (lecture-based) system to active, student-centered learning (Shorofi SA et al., 2016).

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Generally, all educational methods fall into two categories: active and passive learning. In passive approaches, knowledge is transmitted to the learner primarily through lectures or reading, with the expectation that the learner can later apply this knowledge in similar situations. In contrast, active approaches require learners to reflect on their practice, thereby deepening learning (Wyskiel RM et al., 2015). One active teaching method is the use of games (Bäckström J et al., 2013), which have been well-integrated into medical education (Lolaty HA et al., 2014). Notably, the use of games among medical students increases both enjoyment and a sense of responsibility (Oravcová P, Králová E, 2021), while also promoting peer interaction and collaboration (Umbrello M et al., 2019).

Using card games as an active teaching method can enhance students' abilities in problem comprehension and resolution. Through such games, students engage in direct verbal interaction, enabling greater interpersonal engagement, and also derive intrinsic satisfaction upon completing learning tasks (Aiken LH et al., 2024). Card games, being more affordable than most digital educational tools, make learning accessible to lower-income students, who can even create their own DIY cards at home (Milner KA et al., 2021). Implementing these tools in various clinical training settings, particularly in the operating room and PACU, can have remarkable educational impacts. Therefore, utilizing card game-based training can significantly enhance anesthesia nursing students' knowledge and professional skills in caring for patients in special clinical conditions in the recovery room. As previously noted, role-playing within a card game format encourages students to consider the actions appropriate to given scenarios, effectively placing themselves in those circumstances and responding accordingly—thereby learning to manage the challenges existing in special recovery room situations (Wong P et al., 2020).

The key rationales for this study are: 1) its innovative nature in anesthesia nursing education; 2) the essential need for students' proficiency, given the lifesaving decisions anesthesia nurses must make rapidly; 3) providing repeated and practical opportunities to prepare students for real clinical work; 4) making optimal use of educational opportunities; and 5) the most important—training competent clinical professionals, since the discussed complications can arise not only in recovery but also in the operating room and other clinical scenarios. Therefore, the aim of this study is to determine the impact of card game-based teaching on the knowledge and clinical performance of students in decision-making for special PACU cases, as well as the quality of their clinical care. If implemented accurately and consistently, it can produce highly qualified and professional anesthesia nursing graduates for the clinical setting.

## Methods

This experimental study was conducted on 60 undergraduate anesthesia nursing students admitted from 2017 to 2019 at Jundishapur University of Medical Sciences, Ahvaz, in 2020 (1399 in the Iranian calendar). Students were randomly assigned from class lists into intervention (card-game) and control groups. Due to the emergence of COVID-19, students were required to attend clinical internships with appropriate safety measures and protocols. The intervention was conducted with physical distancing and adherence to health regulations. All students had previously attended the PACU for practical training and had received recovery-related coursework both in-person and virtually.

**Eligibility criteria** included: informed consent, being a 2017-2019 anesthesia nursing student, and not having participated in similar research. **Exclusion criteria** were: withdrawal of consent, irregular attendance, and incomplete questionnaire responses.

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**Data collection instruments** included two researcher-designed questionnaires: one on demographic factors and stress control, and one on clinical performance assessment.

- The first questionnaire (demographics & stress control) completed after explanation and consent, comprised two parts: three demographic items (age, gender, academic term) and 44 items evaluating stress factors in four domains—unpleasant emotions (14 items), humiliating experiences (7 items), clinical actions (13 items), and interpersonal communication (10 items)—rated on a four-point Likert scale (low, moderate, good, excellent) with scores from 1 to 4 per item. Domain scores were normalized to 100; total scores ranged from 25 to 100. Content validity was confirmed via literature review and feedback from eight faculty members; the Cronbach's alpha was 0.98 for internal consistency. Questionnaires were anonymized for ethical compliance.

- The clinical performance assessment evaluated students' practical skills in anesthesia principles and procedures (34 items), rated on a five-point Likert scale (no skill, low skill, moderate, high skill, not taught) based on the national anesthesia nursing curriculum. Scores ranged from 0% (no student skilled or trained) to 100% (all students highly skilled for that item). The questionnaire was validated by five anesthesia nursing faculty from Jundishapur University. Clinical instructors assessed students' skills for each competency, and all participant data remained confidential.

For the intervention group, in addition to standard theory and practical classes, five card game sessions were conducted by anesthesia faculty. The first session covered gameplay rules; sessions two through five involved students practicing the game. Each PACU case and corresponding interventions were listed in the game instructions and on individual cards used during the sessions. For example, airway spasm treatment cards included: maintain calm, open airway, CPAP, medication, which students arranged in the correct sequence. Students worked in pairs, each assigned a case and a shuffled set of intervention cards, and were tasked with demonstrating treatment combinations. Instructors reviewed the arrangements and provided feedback. At the end, key intervention summaries were reviewed. Students were encouraged to continue using cards individually or in groups for one month; the control group underwent only routine practical training.

It is noteworthy that the card content was based on references provided by the Ministry of Health for recovery theory coursework. Initial versions were reviewed and revised in collaboration with students, PACU nurses, and faculty, before being finalized and distributed for classroom use.

All data were analyzed via SPSS 26, using descriptive and inferential statistics, including independent t-tests (for comparing mean scores by age, gender, and term), means, standard deviations, and Spearman correlation tests.

**Results**

Pre- and post-test data from the experimental and control groups were analyzed using descriptive and inferential statistics. The descriptive analysis included frequency, percentages, means, and standard deviations; for inferential analysis, independent t-tests were performed.

**Pre-test scores** for the experimental group averaged 11.9 (range: 6–14, SD: 4.2; n=28), while the control group averaged 12.3 (range: 5–16, SD: 3.9; n=32) (Table 1).

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**Table 1: Pre-Test Scores of Experimental and Control Groups in PACU Course**

| Group | N | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Experimental | 28 | 11.9 | 4.2 | 6 | 14 |
| Control | 32 | 12.3 | 3.9 | 5 | 16 |

**Post-test scores** showed that in the experimental group, the mean was 17.15 (range: 8–19, SD: 1.63; n=28), and in the control group, 14.17 (range: 6–17, SD: 3.19; n=32) (Table 2).

**Table 2: Post-Test Scores of Anesthesia Nursing Students in Experimental and Control Groups**

| Group | N | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Experimental | 28 | 17.15 | 1.63 | 8 | 19 |
| Control | 32 | 14.17 | 3.19 | 6 | 17 |

Analysis revealed a statistically significant difference with a t-value of 5.39 (Table 3), indicating the effectiveness of the intervention.

**Table 3: Independent t-Test Comparing Mean Post-Test Scores between Groups**

| Levene's F | Sig. | t | df | Mean Diff | p-value |
|---|---|---|---|---|---|
| 8.72 | 0.72 | 5.39 | 12.12 | 3.79 | 0.001 |

Given the significant difference in mean scores between groups, it can be concluded that instruction via card-based games is more effective than traditional teaching methods.

**Discussion and Conclusion**

This study evaluated the impact of card game-based education on the clinical performance of anesthesia nursing students in decision-making for patient care in the PACU. Findings revealed that students instructed using card games achieved significantly higher post-test scores compared to those taught by traditional methods ($t=5.39$, $p<0.001$). These results concur with the broader literature on gamified learning.

For example, Cheung SY and colleagues (2021) demonstrated that integrating gamification with traditional teaching enhanced learning effectiveness among physical education students. Similarly, Zhao D et al. (2022) examined student reactions to game-based learning in programming courses and found universal benefits, though effectiveness varied by background and game type. Yu et al. (2021) concluded that most educational games increase students' motivation, attitudes, confidence, and academic achievements, with game-based learning fostering better engagement and memory than non-game-based methods.

Bulut D et al. (2022) also found that designing educational games significantly improved creative thinking skills among elementary students, indicating that games provide not only repetitive practice but also opportunities to nurture creative thought.

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Collectively, these findings indicate that educational games—including card games—are effective instructional tools. Card games, in particular, offer engaging, interactive learning environments, promoting active learning and enhancing clinical decision-making skills in simulated scenarios. Such approaches help bridge theoretical knowledge and practical application, better preparing students for real-world clinical challenges.

When comparing these findings with similar studies in related fields, game-based learning is shown to be effective across medical disciplines. For instance, Basiri Moghaddam et al. (2025 [1404]) reported that collaborative game-based education improved both learning and satisfaction among operating room students regarding surgical instruments; student engagement and attention increased due to the active nature and competitive atmosphere of the method. Asadzadeh et al. (2025 [1404]) found that pantomime-based game learning in environmental health engineering led to higher scores, knowledge, and satisfaction compared to traditional methods. Ranjbar Fard et al. (2021 [1400]) found students favored game-based education over software-based and traditional approaches, citing greater satisfaction, interactivity, enjoyment, increased motivation, and learning efficacy.

Overall, game-based learning can generally increase learning outcomes, skill development, and social activity levels among students. Creating attractive and interactive environments encourages active student engagement and strengthens skills vital for professional and social success.

**Recommendation:** Card game-based education should be considered a complementary and effective method in anesthesia nursing curricula, especially in clinical PACU training. This approach can enhance clinical care quality and improve students' decision-making skills in clinical settings.

**Limitations:** The main limitations were the relatively small sample size and convenience sampling, which may affect the generalizability of the results. Further studies with larger, randomly selected samples and long-term follow-up are needed to validate and extend these findings. Future research can also examine the impact of card games on other aspects of anesthesia nursing performance, such as communication skills, teamwork, and stress management.

**References**

Abdollahi, Entezari, Aminian K, Zare.Assessment of the Current Status of Recovery Rooms in Hospital Operating Theatres of Yazd Province, 2010-2011.Shahid Sadoughi University of Medical Sciences Scientific Research Monthly Journal. 2012; 20(3): 361-370.

Alvarez GF, Kirby AS. The perspective of families of the critically ill patient: their needs. Current opinion in critical care. 2006;12(6):614-8.

Aiken LH, Sermeus W, McKee M, Lasater KB, Sloane D, Pogue CA, Kohnen D, Dello S, Maier CB, Drennan J, McHugh MD. Physician and nurse well-being, patient safety and recommendations for interventions: cross-sectional survey in hospitals in six European countries. BMJ open. 2024 Feb 1;14(2):e079931.

Asadzadeh, Seyedeh Nastaran; Moradnia, Hadi. A Study and Comparison of the Educational Effectiveness and Student Satisfaction among Environmental Health Engineering Students at North Khorasan University of Medical Sciences with Respect to Water Quality Management Classes Using the Pantomime Educational Game Method versus the Traditional Teacher-Led Method in 2024. Horizons of Medical Education Development. 2025 May 10.

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Basiri Moghaddam, Mehsa; Arab Khazaei, Az; Pouladkhai.Comparison of the Effects of Cooperative Game-Based Education and Traditional Teaching on the Learning and Satisfaction of Operating Room Students in Recognizing Surgical Instruments and Equipment.Horizons of Medical Education Development. 2025 Apr 19.

Boyer NL, Forbes DA, Chung KK. Practical management of burns and inhalation injury. Current Pulmonology Reports. 2016;5(2):63-9.

Bäckström J, Willebrand M, Sjöberg F, Haglund K. Family members of patients with severe burns: Experiences during care and rehabilitation. 2013.

Bulut D, Samur Y, Cömert Z. The effect of educational game design process on students' creativity.Smart Learning Environments. 2022 Jan 21;9(1):8.

Cheung SY, Ng KY. Application of the educational game to enhance student learning. InFrontiers in Education 2021 Mar 31 (Vol. 6, p. 623793). Frontiers Media SA.

Gasteratos K, Papakonstantinou M, Man A, Babatsikos E, Tamalonis A, Goverman J. Adjunctive nonpharmacologic interventions for the management of burn pain: a systematic review. Plastic and Reconstructive Surgery. 2022 May 1;149(5):985e-94e.

.Lolaty HA, Bagheri-Nesami M, Shorofi SA, Golzarodi T, Charati JY. The effects of family-friend visits on anxiety, physiological indices and well-being of MI patients admitted to a coronary care unit. Complementary therapies in clinical practice. 2014;20(3):147-51.

Milner KA, Marmo S, Goncalves S. Implementation and sustainment strategies for open visitation in the intensive care unit: a multicentre qualitative study. Intensive and Critical Care Nursing. 2021 Feb 1;62:102927.

Norozi V, Ghazi A, Amani F, Bakhshpoori P. Effectiveness of sublingual buprenorphine and fentanyl pump in controlling pain after open cholecystectomy. Anesthesiology and pain medicine. 2021 Aug 8;11(3):e113909. Nolan S, Murphy J. The tried, true, and new: a traditional approach to critical care education with a new twist. Critical care nursing quarterly. 2006;29(3):199-206.

Oravcová P, Králová E. Use of Canistherapy in the Rehabilitation of a Child with Cerebral Palsy. University Review. 2021;15(3):6-11.

Pogatzki-Zahn EM, Segelcke D, Schug SA. Postoperative pain—from mechanisms to treatment. Pain reports. 2017 Mar 1;2(2): e588.

Ranjbar Fard, Zandvakili.Comparison and Evaluation of Three Methods: Game-Based Education, Specialized Educational Software, and Traditional Teaching from Students' Perspectives. Educational Technology. 2021 Sep 23; 15(4): 635-647.

Shorofi SA, Jannati Y, Moghaddam HR, Yazdani-Charati J. Psychosocial needs of families of intensive care patients: perceptions of nurses and families. Nigerian medical journal. 2016 Jan 1;57(1):10-8.

Spreen AE, Schuurmans MJ. Visiting policies in the adult intensive care units: a complete survey of Dutch ICUs. Intensive and Critical Care Nursing. 2011;27(1):27-30.

Strand EB, Kerns RD, Christie A, Haavik-Nilsen K, Klokkerud M, Finset A. Higher levels of pain readiness to change and more positive affect reduce pain reports–a weekly assessment study on arthritis patients. Pain. 2007;127(3):204-13.

Taal L, Faber A. Burn injuries, pain and distress: exploring the role of stress symptomatology. Burns. 1997;23(4):288-90.

Umbrello M, Sorrenti T, Mistraletti G, Formenti P, Chiumello D, Terzoni S. Music therapy reduces stress and anxiety in critically ill patients: a systematic review of randomized clinical trials. Minerva anestesiologica. 2019;85(8):886-98.

Wyskiel RM, Weeks K, Marsteller JA. Inviting families to participate in care: a family involvement menu. Joint Commission journal on quality and patient safety. 2015;41(1):43-6.

Wong P, Redley B, Digby R, Correya A, Bucknall T. Families' perspectives of participation in patient care in an adult intensive care unit: A qualitative study. Australian Critical Care. 2020 Jul 1;33(4):317-25.

Xu X, Wen H, Hu Y, Liu Z, Pan X. Efficacy of intra-articular magnesium for postoperative analgesia in total hip arthroplasty. Biomedical reports. 2017 Feb 1;6(2):232-6.

Yu Z, Gao M, Wang L. The effect of educational games on learning outcomes, student motivation, engagement and satisfaction. Journal of Educational Computing Research. 2021 Jun;59(3):522-46.

Zhao D, Muntean CH, Chis AE, Rozinaj G, Muntean GM. Game-based learning: Enhancing student experience, knowledge gain, and usability in higher education programming courses. IEEE Transactions on Education. 2022 Jan 10;65(4):502-13.