Macrothink Institute™

Journal of Biology and Life Science
ISSN 2157-6076
2025, Vol. 16, No. 2

Analysis of the Effect of Applying Group Teaching Mode on Nursing Students' Job Competence in Nursing Teaching in Anesthesiology Department

Siyu Peng

Anesthesia and surgery Center, Deyang People's Hospital

No. 173, Section 1, Taishan North Road, Jingyang District, Deyang City, Sichuan, China

Tel: 86-18142501805 E-mail: p18142501805@163.com

Qi Hu (Corresponding author)

Anesthesia and surgery Center, Deyang People's Hospital

No. 173, Section 1, Taishan North Road, Jingyang District, Deyang City, Sichuan, China

Tel: 86-15271900180 E-mail: 15271900180@163.com

Received: December 14, 2024 Accepted: February 5, 2025 Published: February 11, 2025

doi:10.5296/jbls.v16i2.22644 URL: https://doi.org/10.5296/jbls.v16i2.22644

Abstract

To explore the effect of the application of group teaching mode on nursing students' job competence in nursing teaching in anesthesiology department, 30 nursing students interned in the Department of Anesthesiology of our hospital from January 2023 to June 2023 were selected as the subject of this study, and they were randomly divided into the control group (traditional teaching mode) and the experimental group (group teaching mode) by using the method of simple numerical expression, and the overall performance and post-competitive ability of the two groups of nursing students were compared after being taught and studied. As a result, the scores of nursing students in the experimental group were obviously higher than those in the control group ($P<0.05$), and the scores of nursing students in the internship group were significantly higher than those in the control group ($P<0.05$). The application of group teaching mode to anesthesiology nursing students' job competency can effectively improve the overall achievement of nursing students' teaching and job competency, which is worthy of popularization and application in the clinic.

Keywords: anesthesiology nursing, nursing teaching, group teaching mode, job competency

1. Introduction

Anesthesia nursing is a discipline that integrates multidisciplinary knowledge and technology, which not only requires practical nurses to master a solid theoretical foundation, but also emphasizes the exercise of practical skills and clinical decision-making ability (Halterman et al., 2024). Traditional anesthesia nursing teaching, most of which relies on the individual independent learning of practice nurses, often neglects the training and guidance of practice nurses that emphasizes teamwork problem solving ability in the face of complex clinical situations, which may result in practice nurses who may lack the competence to communicate effectively and work in a team in actual practice, thus affecting the effectiveness of their practicing (Yu et al., 2024). The team-based group teaching method refers to the grouping of nursing students to discuss and solve problems encountered in clinical practice through group discussions, case studies and collaborative projects could better cope with this problem, thus deepening their understanding and application of anesthesia nursing-related knowledge, as well as promoting their independent learning ability and teamwork skills(Irvine & Tangalakis, 2024; Zhao et al., 2020) The following is an analysis of the application of group teaching mode in anesthesiology nursing teaching, the specific content is shown below.

2. Information and Methods

2.1 General Information

30 nursing students who were interns in the Department of Anesthesiology of our hospital from January 2023 to June 2023 were selected as the subjects of this study. Inclusion criteria: (1) all of them have completed the basic courses related to anesthesiology nursing at school while obtaining credits; (2) those who were informed and agreed to participate in this study. Exclusion criteria: (1) those who combined with abnormal thinking and logic or mental disorders; (2) those who discontinued their internships in the Department of Anesthesiology due to various reasons that led to the incomplete collection of data. The 30 nurses included in the study were equally divided into the experimental and control groups by using the simple numerical expression method, with 15 nursing students in the experimental group, all of whom were female, with an age distribution of 21-24 (22.36±0.54) years, and 15 nursing students in the control group, all of whom were female, with an age distribution of 21-24 (22.32±0.51) years. The general information of nursing students in the two groups was tested and analyzed by applying statistical software (SPSS 22.0), and the results yielded a P-value higher than 0.05 ($P>0.05$), suggesting that there was no statistical difference and thus they were comparable.

2.2 Methodology

2.2.1 Control Group

Nursing students in the control group were taught in the traditional teaching mode, and the steps are as follows: (1) Selecting teachers: the hospital management team carefully selected nurse practitioners with rich anesthesia nursing experience and high-level anesthesia professional skills to be the internship teachers, and all of the selected teachers must pass the hospital's internal strict examination system to ensure their teaching qualifications, so as to

guarantee the quality of the teaching process. (2) Determining the teaching plan: based on the anesthesiology nursing teaching syllabus and anesthesia work standard, the teachers carefully designed the teaching plan and flexibly adjusted the teaching plan according to the ability characteristics of each nursing student and the progress of the teaching to continuously optimize the content of the teaching procedure. (3) Theoretical knowledge teaching: Based on the established teaching arrangement, the teaching instructor introduced the core theories of anesthesia to each nursing student through face-to-face lectures, covering the characteristics of anesthesia drugs, choice of anesthesia methods, key points of anesthesia safety, as well as anesthesia procedures and regulations in the operating room, so as to build a solid theoretical framework for the nursing students, and to lay a solid foundation for the subsequent practice. (4) Practical skills guidance: after nursing students master the necessary nursing theory knowledge, with the consent of patients and their families, nursing students were arranged to observe the real anesthesia nursing process on site. In this session, nursing students needed to carefully observe the operation skills of the instructor, closely combine theoretical knowledge with practice, and record any doubts in the operation, so that they could communicate with the instructor after the class and seek solutions to their doubts. (5) Comprehensive ability assessment: in the first two weeks near the end of the internship, all the nursing students required to receive a comprehensive professional assessment, aiming at testing their learning effectiveness during the internship, clarifying their personal strengths and room for improvement, and preparing themselves for independent clinical anesthesia nursing work in the future.

2.2.2 Experimental Group

The experimental group adopted the group teaching mode, and the steps of teaching were as follows: (1) Selecting teachers: based on the clinical anesthesia experience, professional skill level, scientific research achievements and teaching ability in the anesthesiology realm, we carefully selected suitable teaching staff to ensure high-quality teaching resources. (2) Planning the teaching program: following the teaching syllabus of the hospital and the norms of anesthesia specialty, the teaching process was carefully designed, and the corresponding clinical examples were selected according to different teaching modules, so as to enhance the pertinence and effectiveness of teaching. (3) Formation of learning team: nursing students were divided into teams of 4 to 5 members, each of whom chose a certain nursing student with strong organizational and coordination skills as the team leader, who was responsible for communicating with both the teachers and team members, and discussing about teaching strategies together. At the initial stage of teaching, the team members should be familiar with the hospital environment and understand the rules and regulations of the Department of Anesthesiology and the operation procedures. (4) Cultivate problem awareness: for specific teaching content, teachers selected typical clinical cases, raised questions around the anesthesia knowledge in the cases, and played as a guiding role to explain the anesthesia process and nursing care precautions, plus encouraging the nursing students to think deeply. (5) Problem solving path: teachers inspired nursing students to take the initiative to learn, use extracurricular time to consult literature, watch videos, etc., and independently explore anesthesia knowledge and find solutions to problems accordingly. The team held regular

internal discussions to share their insights, determine the optimal solution and showed the results through comparative analysis. Consequently, they learnt from each other and broadened their clinical thinking horizons. (6) Sorting out the problems and answers: after the presentation, the instructors should provide standard answers to systematically summarize the thinking of the nursing students, help to construct a knowledge system, and facilitate the review and consolidation of the nursing students. At the same time, they should point out the defects in the solution, guide the nursing students to correct the wrong cognition and conception, and promote the formation of correct critical thinking mode. (7) Implementation of comprehensive assessment: two weeks before the end of internship, a comprehensive professional assessment was conducted for nursing students, covering theoretical test, practical operation and comprehensive evaluation. At the same time, the learning initiative of nursing students and their satisfaction with teaching were assessed, so as to lay a solid foundation for nursing students to engage in clinical anesthesia nursing in the future.

2.3 Observation Indicators

Comparison of the overall performance of the two groups of nursing students after teaching: the overall performance is mainly composed of 4 aspects: basic knowledge, clinical application, understanding and memory, comprehensive analysis, each aspect of the score was evaluated in accordance with the 0-25 points, the total score is 100 points, the higher the score suggests that the better the performance of teaching.

Comparison of the two groups of nursing students' post-competence ability after teaching: anesthesia nurse post-competence evaluation questionnaire for evaluation were distributed thereafter, with the questionnaire containing a total of 35 items in 6 dimensions, including basic knowledge, perioperative knowledge, operational skills, risk control, career development and personal attributes, with a full score of 222 points (Sun et al., 2023).

2.4 Statistical Methods

All the data in this study were analyzed by using SPSS 22.0 software, the overall performance and job competence after teaching with equal measurement data was expressed in($\bar{x} \pm s$). Using independent-sample T-test, the number of cases is expressed in n, and the results of P <0.05 suggests that there is a difference for pending discussion.

3. Results

3.1 Comparison of the Overall Performance of the Two Groups of Nursing Students after Teaching

After the implementation of different teaching modes, the overall scores of nursing students in the experimental group after teaching, such as the scores of basic knowledge, clinical application, comprehension and memorization, and comprehensive analysis were obviously higher than those of the control group, P<0.05, as shown in Table 1 bellow.

Table 1. Comparison of the Overall Performance of the Two Groups of Nursing Students After Teaching ($\bar{x} \pm s$), points

Group	Basic Knowledge	Clinical Application	Comprehension Memory	Comprehensive Analysis
Experimental Group (n=15)	22.45±1.12	21.35±1.24	21.22±1.27	22.05±1.35
Control Group (n=15)	19.36±1.35	18.24±1.45	18.21±1.41	19.45±1.57
t	6.823	6.313	6.143	4.863
P	<0.05	<0.05	<0.05	<0.05

3.2 Comparison of Nursing Students' Post-competency Scores after Teaching in the Two Groups

After the two groups of nursing students were taught in different ways, the post-competence of nursing students in the experimental group was significantly higher than that of the control group, P<0.05, as shown in Table 2.

Table 2. Comparison of Nursing Students' Post-competency Scores After Teaching in the Two Groups ($\bar{x} \pm s$), points

Group	n	Job competence score
Experimental Group	15	84.56.±6.68
Control Group	15	72.14±6.38
t		5.207
P		<0.05

4. Discussion

Nursing education is an important component of hospital nursing practice, and its core task focuses on the education and training of nursing students and in-service nursing personnel, aiming to ensure that the nursing team has a comprehensive grasp of professional knowledge, a high level of professional ethics, and the ability to flexibly apply theoretical knowledge to diverse clinical situations, effectively respond to various types of nursing challenges, and lay a solid foundation for ushering in the nursing career. As a practical extension of nursing education, clinical nursing tutoring is as a bridge connecting college theory and clinical practice, and plays a decisive role in the forging of nursing students' practical skills , It is the key transition of applying nursing-related knowledge from books to actual operation, and also a key link for hospitals to cultivate nursing staff with skillful expertise in line with job

requirements (Luders et al., 2021; Kaihlanen et al., 2019), therefore, clinical teaching is not only about personal growth, but also a powerful driving force to promote the development of nursing career in hospitals.

4.1 The Group Teaching Mode can Effectively Improve the Overall Performance of Nursing Students after Teaching

Traditional anesthesiology nursing teaching method tends to be collective lectures, detailing the key points of nursing work, operation procedures and precautions, and finally assessing the teaching effect through the examination, which is likely to lead to distraction of the students' attention and low participation, affecting the learning efficiency and the depth of knowledge mastery, thus then slowing down the speed of nursing students' adaptation to the actual workplace (Ma et al., 2023). In this study, by applying the group teaching mode to the observation group of nursing students and designating specialized instructors to be responsible for the group, the individualization and refinement of teaching were realized, which enabled the instructors to pay close attention to the specific performance of each member of the group in the practical operation, find and correct the errors in a timely manner, and at the same time respond quickly to the various questions encountered by the students in their internship, so as to ensure that each internship nurse could obtain sufficient hands-on opportunities and gain a deeper understanding of the anesthesiology department. Consequently, it ensures that every nurse have enough opportunities to do hands-on work and deeply understand the daily operation and core knowledge of the anesthesiology department, as explained in the overall scores of the experimental group, which were obviously higher than those of the control group.

4.2 Group Teaching Mode Can Effectively Improve Nursing Students' Job Competency

In this study, through the implementation of group teaching mode for the experimental group of nursing students, common problems and actual cases of anesthesia complications were discussed in a group manner, which promoted the sharing and deepening of knowledge, enhanced the nursing students' ability to analyze and solve problems , and also significantly improved the proficiency of the intern nursing students in the actual operation, which helped to lay a solid foundation for them to be competent in clinical anesthesia nursing in the future, and at the same time, they can also show stronger coping ability and skillful operation skills when facing the actual clinical situation, Meanwhile, they can better realize the process of learning, practicing and reflecting, which ensures that the nursing students are able to quickly identify the problems in clinical care and immediately find solutions with the assistance of the team, as explained in the job competence of nursing students in the experimental group, which is significantly higher than that of the control group (Gao et al., 2024).

5. Limitations and Conclusion

In this study, due to the lack of male nursing practitioners, the research subjects were limited to female nursing students, the results of the study have certain limitations and gender bias. At the same time, owing to the influence of internship courses and other factors, interns need to rotate through several departments, but the internship time in the Department of

Anesthesiology is relatively short, and the observation results are only those of the internship in the Department of Anesthesiology, and the interns' learning progress has not been tracked. Therefore, it is necessary to further improve and test the results of interns' learning progress in the future practices. In conclusion, the application of group teaching mode to the application of anesthesiology nursing students' job competence could effectively improve the overall performance of nursing students' teaching and job competence, which is worth researching, promoting and applying in the clinic.

Acknowledgments

Not applicable.

Authors contributions

Not applicable.

Funding

Not applicable.

Competing interests

Not applicable.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Macrothink Institute.

The journal’s policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Gao, N., Fu, K., Li, N., & He, W. (2024). Research on the application of CBL combined with BOPPPS teaching mode in oral and maxillofacial surgery teaching: A randomized controlled study. *Scientific Reports, 14*(1), 26510. https://doi.org/10.1038/s41598-024-77432-4

Halterman, R. S., Broxton, S., & Joshua, T. (2024). The effects of using a flipped classroom pedagogy in nursing anesthesia education: A program evaluation. *International Journal of Nursing Education Scholarship, 21*(1). https://doi.org/10.1515/ijnes-2023-0075

Irvine, S., & Tangalakis, K. (2024). An Exploratory Study of Undergraduate Nursing Students' Experiences of Group Work in Block Model Teaching. *Nursing Education Perspectives, 45*(6), 360-362. https://doi.org/10.1097/01.NEP.0000000000001234

Kaihlanen, A. M., Elovainio, M., Salminen, L., Haavisto, E., & Sinervo, T. (2019). Final clinical practicum of nursing education and transition experience of new nurses. *European Journal of Public Health, 29*(Supplement_4), ckz187.173. https://doi.org/10.1093/eurpub/ckz187.173

Luders, E., Cooper, S., Cant, R., Waters, D., Tower, M., Henderson, A., … & Reid-Searl, K. (2021). Nursing degree students' clinical placement experiences in Australia: A survey design. *Nurse Education in Practice, 54*, 103112. https://doi.org/10.1016/j.nepr.2021.103112

Ma, X., Duan, Y., Ma, Y., Gao, Z., & Zhang, H. (2023). Co-teaching in medicine and nursing in training nurse anesthetists: A before-and-after controlled study. *BMC Medical Education, 23*(1), 856. https://doi.org/10.1186/s12909-023-04827-8

Sun, J., Shan, W. C., Liu, J. M., Zhang, Q. Q., Ye, Y., Huang, S. T., & Zhong, K. (2023). Construction of clinical research nurse training program based on position competence. *World Journal of Clinical Cases, 11*(30), 7363-7371. https://doi.org/10.12998/wjcc.v11.i30.7363

Yu, H., Zhang, C., He, J., & Xu, J. (2024). Reflections on training and teaching modes for anesthesia monitoring nurses in China. *Heliyon, 10*(2), e24540. https://doi.org/10.1016/j.heliyon.2024.e24540

Zhao, W., He, L., Deng, W., Zhu, J., Su, A., & Zhang, Y. (2020). The effectiveness of the combined problem-based learning (PBL) and case-based learning (CBL) teaching method in the clinical practical teaching of thyroid disease. *BMC Medical Education, 20*(1), 381. https://doi.org/10.1186/s12909-020-02306-y