

The Application of "Temporary Tutor System" in Anesthesiology Training for Non - Anesthesiology Specialty Trainees

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Abstract

To train and teach students of non-anesthesiology specialty is an integral part of the standardized training of anesthesiology department. However, there are not many reports on teaching experiences for non-anesthesia students. This research aimed to observe the effect of relatively fixed teachers and teaching process in the rotation training of anesthesiology department for non-anesthesia students. Sixty non-anesthesia residents were included in this study and divided into observation group and control group. The observation group was assigned with fixed teachers and the teaching process was relatively fixed. The control group was assigned with teachers randomly according to the traditional scheduling method of our department, and the teachers decided the specific teaching plan and content by themselves. Results showed that the theoretical and skill test scores of the observation group were significantly higher than those of the observation group at the end of rotation training. In terms of teaching satisfaction, the observation group was significantly higher than the control group. The results showed that fixed teacher and teaching process had a positive effect on improving the quality of teaching and the satisfaction of teaching during the rotation training in the department of anesthesiology.

Keywords: Standardized training; Non-anesthesiology professional; Teaching methods; Teaching quality

Introduction

Standardized training is an important part of continuing education for medical students after graduation, and it is also a necessary stage for residents to learn and grow. The department of anesthesiology is a secondary clinical discipline, which plays an important role in the standardized training of resident doctors. The department of anesthesiology not only undertakes the training tasks for the trainees of anesthesia specialty, but also undertakes the training tasks for the trainees of non-anesthesia majors such as surgery-related majors and emergency-related majors [1]. For non-anesthesia students, the training period is relatively short. In order to complete the training content stipulated in the training program and achieve the training objectives, students need to make more efforts. Besides, teachers also need to pay more attention to the students, and constantly explore and improve the teaching methods, aiming to achieve the purpose of efficient and high-quality training [2,3].

At present, there is no uniform requirement for teaching methods of non-anesthesia professional students in rotation training of anesthesiology department, and the relevant experience is not enough [4]. Training bases are also constantly exploring teaching methods. This study analyzed the training effect of non-anesthesia students received by the anesthesia professional base of the First Affiliated Hospital of Anhui Medical University, and observed the effect of fixing the teacher and teaching procedure on the training quality of students through "temporary tutorial system".

Materials and Methods

Materials

Sixty residents of non-anesthesia specialties who participated in standardized training in the anesthesia professional base of the First Affiliated Hospital of Anhui Medical University in China from 2016 to 2019 were selected as the study subjects. The training majors of the trainees mainly include general surgery, neurosurgery, bone surgery, plastic surgery and other related majors in the surgery departments, and the training time of all the trainees in the department of anesthesiology is 2 months.

Methods

A total of 60 non-anesthesiology majors with rotation training requirements in anesthesiology were included in this study. After admission, the students were randomly divided into two groups, namely observation group and control group. Among them, the trainees in the observation group will be assigned temporary tutors within the 2-

month training period, so as to fix the tutors and carry out the teaching according to the training plan. The specific training process and content are shown in **Table 1**. In the control group, the training process was arranged according to the existing scheduling habits of the department. The teachers were not fixed, and the specific clinical teachers were arranged by themselves. All instructors shall be qualified as resident training instructors, senior attending physicians or above, and all instructors shall understand the training content to be completed by the trainees during the training.

Table 1: Specific training process of students in the observation group.

Schedule	Training contents	Training goals
Week 1	1. To finish admission training (carried out by chief residents); 2. To understand the working process of anesthesiology department; 3. To attend preoperative visit; 4. to learn basic theoretical knowledge related to anesthesia.	To be familiar with the working procedure of anesthesiology department and to understand the basic theory of anesthesiology.
Week 2	1. To follow with the teacher to carry out blood pressure, pulse, ECG monitoring and other operations; 2. To practice mask ventilation, tracheal intubation, laryngeal mask placement and other skills through video learning and simulated human operation; 3. To continue with learning the basic theoretical knowledge related to anesthesia.	To master basic anesthesia related monitoring; to be familiar with basic operation skills process.
Week 3	Students follow teachers to carry out anesthesia implementation and management.	To understand general anesthesia management, and to master the technical operation of tracheal intubation.
Week 4	Students observe and learn about the preparation and management of complex anesthesia.	To understand complex anesthesia management.
Weeks 5-7	Students work as general doctors with the teacher's instruction to implement anesthesia management.	To master the skill of arterial puncture catheterization; to understand nerve block, deep vein puncture and other procedures.
Week 8	Anesthesia recovery room study, including tracheal/laryngeal mask removal, acute pain and other convalescent complications management.	To be familiar with anesthesia management during convalescence.

Observation index

Result of examination: At the end of rotation in the department of anesthesiology, all trainees need to accept two parts of assessment: theoretical assessment and clinical skill assessment. The full score of both tests is 100 points.

Students' satisfaction with teaching methods: After completing the graduation examination, the students completed the anonymous questionnaires, and gave a comprehensive score to the teaching satisfaction in our department, with full score of 100.

Statistical analysis

We used SPSS19.0 statistical software to analyze the data. Measurement data were reported as mean \pm standard error of mean (SEM). Independent-samples T test was used to compare data between two groups. Qualitative data were expressed with relative number and Fisher's exact test was used to compare the difference between two groups. $P < 0.05$ was considered as of difference and significant.

Results

Comparison of general characteristics between two groups

We analyzed and compared the gender, age, education background and other basic information of the two groups of students. There was no significant difference in gender composition, age and educational background between the two groups. In addition, all students have obtained bachelor's or master's degrees. There was no statistical difference between the two groups in terms of educational background composition. The detailed basic information of the two groups of students is shown in [Table 2](#).

Table 2: Demographic characteristics of students.

Group	Age (y)	Gender (male/female)	Education background (graduate/master)
Control (n=30)	24.37 \pm 1.43	26/4	27/3
Observation (n=30)	24.17 \pm 1.45	25/5	26/4

Notes: There was no statistical difference between groups.

Comparison of two groups of students' exam results

The results showed that the test scores of the students from observation group were higher than those of the control group. In particular, the skill operation scores of the students from observation group improved more significantly than that of the control group. The detailed results of the two groups are shown in [Table 3](#).

Table 3: Examination results of two groups of students (Mean±SEM).

Group	Theory test score	Skill test score
Control (n=30)	80.43±6.70	80.63±7.66
Observation (n=30)	84.27±6.28*	86.17±5.29**

Notes: Compared with the control group, *p<0.05, **p<0.01

Comparison of students' satisfaction scores on teaching

In addition to the examination, students also conduct a survey of satisfaction with teaching after completing training in anesthesiology. The results showed that the satisfaction score of the observation group was significantly higher than that of the control group. The specific satisfaction scores of the two groups are shown in [Table 4](#) below.

Table 4: Satisfaction scores of students on teaching (Mean±SEM).

Group	Teaching satisfaction rating
Control (n=30)	82.60±5.92
Observation (n=30)	89.37±4.62***

Note: Compared with the control group, ***p<0.01

Discussion

In this study, we observed the effect of "Temporary Tutor System" in anesthesiology training. In this training system, teachers and teaching process were relatively fixed for each non-anesthesia students in the training of anesthesiology department. The results showed that both the theoretical and skill test scores of students trained with the "Temporary Tutor System", named observation group, were significantly higher than those students trained with traditional methods, named control group. In terms of teaching satisfaction, the observation group

was significantly higher than that in the control group.

The clinical teaching and training of non-anesthesiology students is a part of the standardized training of anesthesiology residents [1]. Through regular and reasonable training in the department of anesthesiology, surgical trainees can further improve their understanding and mastery of the preoperative preparation of surgical patients and the management of common postoperative acute pain. It can help to improve the quality of perioperative management of surgical patients. Since the standardized training of resident doctors has been promoted throughout the country, educators in the field of anesthesia have been exploring more optimized teaching methods [3,5]. However, these works mainly focus on the training of anesthesia professional students, and the experience of teaching non-anesthesia professional students is relatively less. In addition, due to the short rotation training time in the department of anesthesiology, the teachers and students in the department of anesthesiology often have problems such as insufficient attention, poor sense of belonging and so on [2]. The existence of these problems is very unfavorable to the completion of the training content of non-anesthesia majors in the department of anesthesiology, to achieve the training objectives. This study shows that non-anesthesia professional students during the training of anesthesiology department relatively fixed teaching teachers, according to the unified training content and process can significantly improve the quality of training students, mainly reflected in the significant improvement of the theory and skill assessment results. In addition, this teaching mode and program makes students more satisfied with teaching.

Theoretical study is an important content of standardized training for resident doctors. In this study, the teachers in the observation group were relatively fixed, which was of great significance in urging residents to learn basic theories of anesthesiology. Teachers can help students consolidate the theoretical knowledge they have learned and achieve the goal of efficient learning by combining theory with practice and asking questions about the theoretical knowledge in clinical teaching. The results of this study also confirmed that the students in the teacher group with relatively fixed band had a better grasp of the basic theories of anesthesiology than those in the teacher group with non-fixed band.

Clinical skill operation training is another important part of the standardized training of resident doctors. For the training of residents' skill operation, the department of anesthesiology has great advantages in arterial puncture catheterization, deep vein puncture, open airway, tracheal intubation and first aid resuscitation, etc. [6-8]. The instructors have very rich experience, and the trainees have more practical operation opportunities required by relevant training. However, rotation and training in the department of anesthesiology is relatively short for non-anesthesiologists. The duration of training in the department of anesthesiology for most non-anesthesiology

students is 2 months, and the rotation time for some specialties is only 1 month. Due to the limited training time and the constant change of instructors, teachers may overestimate or underestimate the knowledge and skills mastered by students, thus affecting both clinical safety and also the rapid and efficient learning of students. In this study, teachers for students of observation group are relatively fixed and students are guided according to established training procedures. This kind of teaching mode ensure that the teachers have a full understanding of the students, teach according to the learning, and achieve the purpose of high-quality teaching and efficient learning. Besides, relatively fixed teaching teachers can also enhance students' sense of belonging, increase teacher-student communication, promote teaching and learning, and improve students' satisfaction with teaching. Indeed, the results of this study also confirm that the relatively fixed tape teacher also has a more positive effect on the training of clinical skills.

Conclusion

This study shows that the application of "Temporary Tutor System" for non-anesthesia students while they study in department of anesthesiology plays a positive role in improving the quality of training and improving the satisfaction of teaching.

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