

# To Explore the Effect of PBL Teaching Method on Clinical Interns' Cardiopulmonary Resuscitation Training

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## Abstract

**Objective** To explore the training effect of PBL teaching method on cardiac resuscitation of clinical interns. **Methods:** 40 clinical interns who were interned in our hospital from July 2019 to July 2020 were selected as the research objects. They were divided into two groups by random number method: experimental group and routine group, with 20 cases in each group. The routine group adopts the routine teaching method, that is, oral teaching; The experimental group adopted PBL teaching method on the basis of the control group, that is, designed a set of learning scenario teaching. The learning effect, teaching effect and satisfaction of the two groups were observed and compared. **Results:** the scores of theoretical knowledge and practical skills of the students in the experimental group were higher than those in the conventional group ( $P < 0.05$ ); The clinical interns in the experimental group can significantly improve their learning efficiency, increase their autonomous ability of self-learning, meet their self-learning needs, enhance their understanding of cardiopulmonary resuscitation knowledge, mobilize their enthusiasm for learning, understand more knowledge, deepen and expand their knowledge. Its effect was generally higher than that of the traditional teaching method in the conventional group ( $P < 0.05$ ); The total satisfaction of interns in the experimental group (100%) was much higher than that in the conventional group (70.00%) ( $P < 0.05$ ). **Conclusion:** compared with conventional teaching methods, PBL teaching method has better training effect on cardiopulmonary resuscitation of clinical interns, and can arouse students' academic achievement and learning enthusiasm. It is worthy of clinical teaching promotion and application.

## Keywords

PBL teaching method; Clinical intern; Cardiopulmonary resuscitation; Effect.

## 1. Introduction

Cardiopulmonary resuscitation (CPR) is a life-saving technique for cardiac and respiratory arrest. The purpose is to restore the patient's autonomic respiratory and circulatory function [1-2]. In August 2020, the Red Cross Society of China and the Ministry of Education jointly issued the notice on Further Strengthening and improving the Red Cross work in schools in the new era, which included students' health knowledge, first aid information, especially cardiopulmonary resuscitation. For clinical interns, cardiopulmonary resuscitation is one of the operation skills that must be mastered in clinical practice [2-4]. If they can not effectively combine the theoretical knowledge and practical knowledge, they will feel panic in front of patients with cardiac and respiratory arrest. The traditional form of clinical education is mainly teacher knowledge education, which is difficult to give full play to the practicality and initiative of clinical interns [5-6]. In the actual teaching, due to the lack of teaching time, it is difficult for

clinicians to teach all knowledge points and practical operations to students, resulting in the lack of students' practical ability. For clinical interns who are about to go to work, effective cardiopulmonary resuscitation is the key to the survival of patients when they have cardiac arrest in the hospital [7-9]. PBL teaching method is a set of teaching methods for specific disciplines. It is a teaching method based on problem-based learning or project-based learning. It is a problem-centered and student-centered teaching mode [10]. In view of this, this paper discusses the effect of PBL teaching method on cardiopulmonary resuscitation training for clinical interns. The report is as follows.

## 2. Data and Methods

### 2.1. General Information

40 clinical interns in our hospital from July 2019 to July 2020 were selected as the research objects. They were divided into two groups with 20 students in each group by random number table. Routine group: 12 boys and 8 girls, aged 18-22 years, with an average age of  $(5.22 \pm 20.17)$  years; Study Group: there were 13 boys and 7 girls, aged 18-22 years, with an average age of  $(5.87 \pm 21.22)$  years. There was no significant difference in basic data such as gender, age, education and achievement between the two groups ( $P > 0.05$ ).

### 2.2. Teaching Methods

#### 2.2.1. Routine Group

Adopt the routine learning mode, that is, teach doctors the theory and knowledge related to cardiopulmonary resuscitation on site, and teach their own clinical experience and knowledge to interns. It is mainly to explain and demonstrate as a teacher. In the actual teaching process, it is mainly oral and demonstration teaching to teach students theoretical knowledge and practical operation demonstration.

#### 2.2.2. The Experimental Group

Implements PBL teaching mode on the basis of the conventional group. ① Training content: knowledge points related to cardiopulmonary resuscitation, i.e. practical operation, including unarmed cardiopulmonary resuscitation, application of simple respirator, use of cardiac electric shock defibrillation, etc; ② In theory teaching, set up teaching scenes, create training atmosphere, scene simulation and other ways to make clinical interns immersive. Prepare the teaching plan according to the actual cases of cardiopulmonary resuscitation encountered in clinic, formulate each teaching content into multiple questions according to the focus of knowledge, and put forward relevant problems of cardiopulmonary resuscitation, such as the application of cardiopulmonary resuscitation, airway support and respiratory support methods of cardiopulmonary resuscitation, effective indicators of cardiopulmonary resuscitation, etc. Then discuss in groups with 5 people in each group for about 20 minutes. After receiving the questions, the students will take the group as the unit and summarize the answers through discussion; The clinical teaching teacher patrolled the discussion class, pointed out the problems existing in the students, and guided the students to query the problems by means of textbooks and network to find the corresponding answers to the problems. After the group discussion, one group member shall be selected to report the discussion results of the group, which shall be supplemented or revised by other groups; ③ Practical teaching: after theoretical learning, organize students to carry out practical operation. Since hospital patients cannot be used as the test object, simulators are used for practical skill operation. The clinical teaching teacher should make a practical demonstration, subdivide the actions first, and point out the operation difficulties and essentials, so that the students can watch next to them. If there is something they don't understand, they can put forward it, and the teaching doctor can answer and demonstrate. Then, after the demonstration, organize

students to carry out the actual operation of cardiopulmonary resuscitation in turn, and remind and correct the incorrect and nonstandard behaviors of clinical interns. After all interns have finished their practice, they will be assessed and their actual operation will be scored; ④ The clinical simulation scenario is designed in combination with the actual clinical situation, so that the clinical interns can play the roles of doctors, nurses, patients and family members to conduct the scenario simulation exercise. After the exercise, they can independently summarize the clinical practice steps and key points of cardiopulmonary resuscitation, and analyze the key points and precautions in the process of cardiopulmonary resuscitation. Finally, the teacher guides and evaluates the answers and demonstration process.

### 2.3. Evaluation Method

① Academic performance: observe and compare the academic performance of the two groups of clinical interns after the end of this internship. It includes theoretical knowledge (basic knowledge related to cardiopulmonary resuscitation, etc.) and practical skill operation (unarmed cardiopulmonary resuscitation, etc.), and the theoretical knowledge is conducted in a unified closed book examination; The operation of practical skills is completed under the supervision of clinical teachers. The full score of both items is 100. The higher the score, the better the performance under this learning mode.

② The evaluation of teaching effect includes seven aspects: improving learning efficiency, increasing self-learning autonomy, meeting self-learning needs, enhancing knowledge understanding of cardiopulmonary resuscitation, mobilizing learning enthusiasm, clarifying knowledge explanation, expanding the scope of knowledge and supplementing the amount of knowledge.

③ Satisfaction: observe and compare the satisfaction rates of the two groups of clinical interns with the two learning modes, including teaching form, teaching effect and teacher-student interaction, which are divided into three aspects: satisfaction, basic satisfaction and dissatisfaction. Satisfaction = (very satisfied + basically satisfied) cases / total × 100%.

### 2.4. Statistical Methods

SPSS 24.0 software was used to process the data. The measurement data is expressed in  $\bar{x} \pm s$ , using t-test, and the counting data is expressed in percentage, using  $\chi^2$  test,  $P < 0.05$ , the difference was statistically significant.

## 3. Results

### 3.1. Compare the Learning Achievements of Interns in the Two Groups under Different Teaching Modes

The scores of theoretical knowledge and practical skills of the students in the experimental group were higher than those in the conventional group, and the difference was statistically significant ( $P < 0.05$ ). See Table 1 for details.

**Table 1.** Comparison of learning achievements of two groups of interns under different teaching modes (scores)

| Group         | n  | Theoretical knowledge score | Practical skill score |
|---------------|----|-----------------------------|-----------------------|
| Test group    | 20 | 89.28±7.41                  | 86.44±6.82            |
| General group | 20 | 81.71±6.55                  | 78.37±6.03            |
| $\chi^2$      |    | 3.423                       | 3.964                 |
| P             |    | <0.001                      | <0.001                |

### 3.2. Compare the Evaluation Effects of the Two Groups of Clinical Interns on the Two Different Teaching Modes

Among the 40 interns who participated in this study, the interns in the experimental group believe that PBL teaching method can significantly improve the learning efficiency, increase the autonomy of self-learning, meet the needs of self-learning, enhance the understanding of cardiopulmonary resuscitation knowledge, mobilize their enthusiasm for learning, understand more knowledge, deepen and expand their knowledge. In conclusion, the students in the experimental group generally recognized the PBL teaching method, which was higher than that in the conventional group ( $P < 0.05$ ). See Table 2.

**Table 2.** Evaluation effect of two groups of interns on two teaching modes [n (%)]

| Survey items   | Test group(n=20) |           |           | General group(n=20) |           |           |
|--|------------------|-----------|-----------|---------------------|-----------|-----------|
|  | Yes              | No        | uncertain | Yes                 | No        | uncertain |
| Improve learning efficiency  | 17(85.00%)       | 2(10.00%) | 1(5.00%)  | 12(60.00%)          | 6(30.00%) | 2(10.00%) |
| Increase self-learning autonomy                                      | 18(90.00%)       | 1(5.00%)  | 1(5.00%)  | 13(65.00%)          | 4(20.00%) | 3(15.00%) |
| Meet self-learning needs   | 18(90.00%)       | 2(10.00%) | 0(0.00%)  | 12(60.00%)          | 5(25.00%) | 3(15.00%) |
| Enhance understanding of CPR knowledge                               | 19(95.00%)       | 1(5.00%)  | 0(0.00%)  | 14(70.00%)          | 3(15.00%) | 3(15.00%) |
| Arouse learning enthusiasm   | 17(85.00%)       | 2(10.00%) | 1(5.00%)  | 13(65.00%)          | 3(15.00%) | 4(20.00%) |
| Clarity of knowledge explanation                                     | 18(90.00%)       | 1(5.00%)  | 1(5.00%)  | 15(75.00%)          | 3(15.00%) | 2(10.00%) |
| Expand the scope of knowledge and supplement the amount of knowledge | 16(80.00%)       | 2(10.00%) | 2(10.00%) | 14(70.00%)          | 4(20.00%) | 2(10.00%) |

### 3.3. Compare the Satisfaction of Two Groups of Clinical Interns with Two Different Teaching Modes

The total satisfaction of interns in the experimental group (100%) was much higher than that in the conventional group (70.00%) ( $P < 0.05$ ). See Table 3 for details.

**Table 3.** Satisfaction of two groups of clinical interns with different teaching modes [n (%)]

| Group               | Satisfied  | Basically satisfied | dissatisfied | Satisfaction |
|---------------------|------------|---------------------|--------------|--------------|
| Test group(n=20)    | 17(85.00%) | 3(15.00%)           | 0(0.00%)     | 20(100%)     |
| General group(n=20) | 6(30.00%)  | 8(40.00%)           | 6(30.00%)    | 14(70.00%)   |
| $\chi^2$            |            |                     |              | 19.063       |
| P                   |            |                     |              | <0.001       |

## 4. Discussion

Cardiopulmonary resuscitation (CPR) is a necessary skill in both clinical and real life. Compared with other medicine, it pays more attention to practical operability and needs strong and skilled hands-on operation ability [11-13]. It is difficult to learn or master the key points and difficulties of cardiopulmonary resuscitation only by relying on classroom or oral teaching of clinical TCM doctors. Clinical practice is not only the first step for students to move towards social work, but also the key turning point for medical students from theoretical learning to

practical operation [14-16]. The learning at this stage is related to students' learning quality and mastery of professional skills. Cardiopulmonary resuscitation is one of the skills that clinical interns need to master. As an important operation content of eating technology, interns not only need to have a solid theoretical foundation, but also need to accurately master practical operation skills, so as to improve the success rate of cardiopulmonary resuscitation and reduce its mortality [17-19]. Therefore, it is very important to improve the training of clinical interns in cardiopulmonary resuscitation.

PBL teaching method is very different from the traditional subject based teaching method. PBL emphasizes students' active learning rather than teachers' teaching in traditional teaching[20]. It is a problem-oriented teaching method, a student-centered education method based on the real world, and "student-centered and problem-based" under the guidance of teachers, Through the form of group discussion, students independently collect data around problems, find and solve problems, and cultivate students' autonomous learning ability and innovation ability. The results of this study show that the indexes of interns in the experimental group using PBL teaching method are higher than those in the conventional group using traditional teaching method. The scores of theoretical knowledge and practical skills of students in the experimental group are higher than those in the conventional group, and the difference is statistically significant ( $P < 0.05$ ); The clinical interns in the experimental group can significantly improve their learning efficiency, increase their autonomous ability of self-learning, meet their self-learning needs, enhance their understanding of cardiopulmonary resuscitation knowledge, mobilize their enthusiasm for learning, understand more knowledge, deepen and expand their knowledge. Its effect was generally higher than that of the traditional teaching method in the conventional group ( $P < 0.05$ ); The total satisfaction of interns in the experimental group (100%) was much higher than that in the conventional group (70.00%) ( $P < 0.05$ ). The reason is that compared with the traditional teaching mode, PBL teaching method is student-centered, problem-oriented and scenario simulation. It can give full play to students' subjective initiative and improve students' learning interest, so as to achieve better teaching effect [21-22]. This teaching method is especially suitable for the training of cardiopulmonary resuscitation skills of clinical interns. It gives practical training, like students throwing out problems, and then let students discuss by themselves. In the process of discussion, interns have the right to speak and choose [23-24]. The teaching teacher can help students solve problems faster at any time, and finally evaluate and correct the discussion results. On the one hand, PBL teaching method can not only help clinical interns better master and understand the professional knowledge related to cardiopulmonary resuscitation, but also pay attention to the development of practical skills, and emphasize the combination of theoretical knowledge and practice [25]. Under this teaching mode, clinical interns can actively participate in the learning process, It improves the interns' theoretical knowledge and practical skills of CPR related theories, and improves the clinical thinking ability of clinical interns. On the other hand, it also promotes the continuous progress of clinical teaching teachers, adapts to the teaching needs of the new era, keeps learning, brings this teaching method to the whole clinical teaching, and combines traditional theories with practical cases, laying a solid foundation for clinical training of high-quality medical personnel in the future [26-27].

To sum up, compared with the traditional teaching mode, the application of PBL teaching method can better show the key points and difficulties of cardiopulmonary resuscitation training. For clinical interns, it is one of the best teaching methods at present. It can effectively improve the learning quality and performance of interns and improve students' autonomous learning ability, which is unmatched by the traditional teaching mode. In view of this, it is suggested to further promote and apply it in clinical teaching.

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