

Application of Microteaching Combined with Problem-Based Learning (PBL) Teaching Model in Teaching Clinical Nursing Interns in Otorhinolaryngology Department

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Abstract: *Objective:* To explore the application effect of microteaching combined with problem-based learning (PBL) teaching mode in teaching clinical nursing interns in otorhinolaryngology department. *Methods:* A total of 72 nursing students who interned in our hospital from June 2022 to February 2023 were selected, and all of them were comprehensively trained in basic theoretical knowledge as well as practical skills before the beginning of their learning tasks. The students were randomly divided into the control group and the experimental group, with 36 students in each group. The control group was taught using the traditional clinical nursing teaching mode, and the experimental group was taught using microteaching combined with the PBL teaching mode, subsequently comparing the differences between the two groups of interns in the degree of mastery of theoretical knowledge, hands-on skills, teamwork ability, patient satisfaction, and other aspects. *Results:* In terms of mastery of theoretical knowledge, the interns in the experimental group (97.22%) were significantly better than that of the control group (75.00%) ($P < 0.05$); the interns in the experimental group had significantly better practical skills (77.78%) than that of the control group (55.56%) ($P < 0.05$); the interns in the experimental group had significantly better teamwork ability than the control group ($P < 0.05$); through the questionnaire survey, it was found that students' satisfaction with teaching in the experimental group (97.22%) was also significantly higher than that in the control group (75.00%) ($P < 0.05$). *Conclusion:* The application of microteaching combined with PBL teaching mode in the teaching of clinical nursing interns in otorhinolaryngology department achieved significant results. It can not only improve the professional knowledge and application ability of nursing students, but also cultivate their independent thinking, problem-solving skill, as well as teamwork ability. It can also improve the teaching quality and patient satisfaction, and contribute positively to the development of medical education.

Keywords: Microlearning; Problem-based learning (PBL); Nursing trainee mentoring

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1. Introduction

With the continuous development and progress of medical technology, the teaching of clinical nursing interns is also facing new challenges and opportunities. Although the traditional clinical nursing teaching model can help students to master the basic theoretical knowledge and skills, there are problems such as single teaching method, low participation of interns, and insignificant teaching effect. Therefore, exploring a new and effective clinical nursing teaching mode has become an urgent problem to be solved at present. In this context, microteaching combined with problem-based learning (PBL) teaching mode came into being. Microteaching is a kind of digital teaching resource with micro-video as the core, which has the characteristics of being short and concise, targeted, flexible, convenient, and suitable for the learning needs of different interns^[1-3]. The PBL teaching mode, on the other hand, is a problem-oriented teaching method, which emphasizes that students take the initiative to learn and think during the process of solving practical problems, and cultivates their comprehensive quality and innovation ability^[4-6]. Under the current medical situation, combining microteaching with PBL teaching mode and applying it to the teaching of clinical nursing interns in otolaryngology department has certain practical significance and application value.

2. General information and methods

2.1. General information

A total of 72 nursing students, 21 males and 51 females, who were undergoing internship in our department from June 2022 to February 2023 were selected. The age range was 18–23 (20.3 ± 1.4) years. All the students were thoroughly trained in basic theoretical knowledge as well as practical skills before the commencement of their study assignment. The students were randomly divided into the control group and the experimental group, with 36 students in each group.

2.2. Teaching methods

The control group adopted the traditional clinical nursing teaching mode, which mainly includes pre-service training, business learning, and regular assessment.

The experimental group adopted microteaching combined with PBL teaching mode, and the specific implementation steps are as follows:

- (1) Microteaching: Experienced teachers produced high-quality micro-videos, including case analysis, operation procedures, nursing skills, and other content. Interns watched and learned online at any time during the internship, and at the same time, they communicated with teachers through the online platform to solve problems encountered in learning.
- (2) PBL teaching: Teachers set up problems for interns to find the answers through self-learning and group discussion. Each group carried out internal discussion and role-playing simulation of clinical situations for hands-on practice in specific cases to exercise and strengthen their theoretical knowledge, and cultivate teamwork and hands-on skills. At the same time, teachers tracked the whole process of guidance and timely correction of errors, to ensure good learning effect for interns.
- (3) Regular assessment: For weekly assessment of theoretical knowledge and practical skills, the content of the assessment mainly included basic knowledge, case analysis, operation procedures, etc. The results of the assessment were linked to the internship results, so as to motivate the interns to actively participate in learning.

2.3. Observation index

The differences between the two groups of interns in the degree of mastery of theoretical knowledge, practical skills, teamwork ability, patient satisfaction, and other aspects were compared.

2.4. Statistical methods

All data were analyzed using SPSS22.0 statistical software, and the measurement data were expressed as mean \pm standard deviation (SD) and *t*-test was used; the count data were expressed as rate and χ^2 test was used. The difference was considered statistically significant at $P < 0.05$.

3. Results

3.1. Comparison of the degree of mastery of theoretical knowledge between the two groups of interns

In terms of mastery of theoretical knowledge, the interns in the experimental group (97.22%) were significantly better than that of the control group (75.00%), and the difference was statistically significant ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison between the two groups of interns in terms of mastery of theoretical knowledge [n (%)]

Group	Mastered	Average	Not mastered	Mastery rate
Experimental group ($n = 36$)	31	4	1	35 (97.22)
Control group ($n = 36$)	21	6	9	27 (75.00)
χ^2				7.43
P				0.00

3.2. Comparison of practical skills between the two groups of interns

The excellence rate of interns in the experimental group in terms of practical skills (77.78%) was significantly better than that of the control group (55.56%), and the difference was statistically significant ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison between the two groups of interns in terms of practical skills [n (%)]

Group	Good	Average	Poor
Experimental group ($n = 36$)	28 (77.78)	6 (16.67)	2 (5.56)
Control group ($n = 36$)	20 (55.56)	8 (22.22)	8 (22.22)
χ^2	12.15	0.37	4.32
P	0.00	> 0.05	0.04

3.3. Comparison of teamwork ability between the two groups of interns

The interns in the experimental group were significantly better than the control group in terms of teamwork ability, and the difference was statistically significant ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison between the two groups of interns in terms of teamwork ability [n (%)]

Group	Strong	General	Weak
Experimental group (<i>n</i> = 36)	29 (80.56)	5 (13.89)	2 (5.56)
Control group (<i>n</i> = 36)	16 (44.44)	10 (27.78)	10 (27.78)
χ^2	11.38	2.22	6.67
<i>P</i>	0.00	> 0.05	0.01

3.4. Results of student satisfaction survey

Through the questionnaire survey, it was found that the students' satisfaction with teaching in the experimental group (97.22%) was also significantly higher than that in the control group (75.00%), and the difference was statistically significant ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of students' evaluation and satisfaction survey results [n (%)]

Group	Very satisfied	Satisfied	Unsatisfied	Total satisfaction rate
Experimental group (<i>n</i> = 36)	31	4	1	35 (97.22)
Control group (<i>n</i> = 36)	24	4	8	27 (75.00)
χ^2				4.57
<i>P</i>				0.03

4. Discussion

In the teaching of clinical nursing interns in otolaryngology department, the application of microteaching has been increasingly emphasized. Microteaching is a kind of digital teaching resource with video as the main carrier, which has the characteristics of strong relevance, vivid and interesting, and strong interactivity, and it can help students to better understand and master the knowledge points. In otorhinolaryngology clinical nursing internship, microteaching can provide detailed explanations for common nursing problems, nursing skills, etc., and help students to better master nursing knowledge and skills^[7-10].

PBL teaching mode is a problem-oriented teaching method that emphasizes students' acquisition of knowledge and skills through independent learning, cooperative learning, and critical thinking in the process of solving practical problems. In otolaryngology clinical nursing practice, the PBL teaching model can help students to better understand the patient's condition and nursing needs, and improve their clinical thinking and problem-solving skills^[11-13].

In the teaching of otolaryngology clinical nursing interns, the application of microteaching combined with PBL teaching mode is also becoming more and more widespread. This teaching mode can give full play to the advantages of microteaching and PBL teaching mode to improve students' learning effect and comprehensive quality. In specific practice, teachers can first formulate teaching plans and objectives, and then guide students to learn independently and cooperatively through the combination of microteaching and PBL teaching mode to cultivate students' clinical thinking and problem-solving skills^[14-16].

In the teaching of otolaryngology clinical nursing interns, the application effect of microteaching combined with PBL teaching mode is mainly reflected in the following aspects^[17-20]. In terms of mastery of theoretical knowledge, the interns in the experimental group (97.22%) were significantly better than the 75.00% in the control group ($P < 0.05$), indicating that the use of microteaching in combination with the PBL teaching mode

can help the nursing students to deepen their understanding and impression of the professional theoretical knowledge and skills in the process of internship. By watching micro-videos, nursing students can more intuitively understand the characteristics of otorhinolaryngology-related diseases and the therapeutic nursing process, and they can learn and master relevant nursing skills in a targeted way. At the same time, through the problem-oriented teaching method, it can help nursing students to better utilize what they have learned in the actual work and improve their clinical practice skills.

The PBL teaching mode emphasizes the problem-oriented approach, allowing nursing students to learn and think actively in the process of problem-solving. The excellence rate of 77.78% of interns in the experimental group in terms of practical skills was significantly better than that of the control group (55.56%) ($P < 0.05$), indicating that by guiding the nursing students to collect information independently, and conducting group discussion and role-playing, it can cultivate their independent thinking and problem-solving skills. At the same time, this teaching mode can also help nursing students to better discover, analyze, and solve problems in actual work, and improve their ability to cope with complex clinical situations.

The interns in the experimental group had significantly better teamwork ability than the control group ($P < 0.05$), indicating that the group discussion and role-playing in the microteaching combined with PBL teaching mode can help the nursing students to play their roles better in a team and also improve their teamwork ability. In addition, this teaching mode can also help nursing students to communicate and collaborate better with other medical staff in actual work and establish a harmonious healthcare relationship.

Through the questionnaire survey, it was found that students' satisfaction with teaching in the experimental group (97.22%) was also significantly higher than the 75.00% in the control group ($P < 0.05$), indicating that the use of microteaching combined with the PBL teaching mode can effectively improve the teaching quality and patient satisfaction. Continuously optimizing the teaching mode and teaching content can improve the learning enthusiasm and participation of nursing students, help them to better master professional knowledge and skills, and improve their comprehensive quality and innovation ability. At the same time, this teaching mode can also help nursing students to better understand the needs and nursing requirements of patients, and improve their service quality and patient satisfaction.

5. Conclusion

In conclusion, the application of microteaching combined with PBL teaching mode in the teaching of otolaryngology clinical nursing interns achieved significant results. It can not only improve the professional knowledge and application ability of nursing students, but also cultivate their independent thinking and problem-solving skills as well as teamwork ability. It can also improve the teaching quality and patient satisfaction, and make positive contributions to the development of medical education.

Disclosure statement

The authors declare no conflict of interest.

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