

# Analysis of the Application of the Ladder Teaching Method Combined with Case Teaching in Otolaryngology Nursing Teaching

Xiaorong Yang, Shasha Liu\*, Zhiquan Peng, Ruiqi Li

Shaanxi Provincial People's Hospital, Xi'an 710068, China

\*Corresponding author: Shasha Liu, 18149369221@163.com

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**Abstract:** *Objective:* To analyze the feasibility of adopting a combined ladder and case teaching method in otolaryngology nursing teaching. *Method:* Nursing students in the otolaryngology department were selected. According to the admission time of nursing students, 30 nursing students formed a control group (conventional nursing teaching), and 30 nursing students who were admitted later formed an observation group (ladder and case teaching method). The learning performance and teaching effectiveness of nursing students under different teaching methods were analyzed. *Result:* The academic performance and teaching effectiveness of the observation group were higher than those of the control group ( $P < 0.05$ ). *Conclusion:* The implementation of the ladder and case teaching method during the teaching of otolaryngology nursing significantly improved the student's academic performance and teaching effectiveness. This method has great practical value.

**Keywords:** Ladder teaching; Case teaching; Otolaryngology; Teaching effectiveness

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## 1. Introduction

Otolaryngology is a key department in the hospital and holds strong professionalism in clinical work. The anatomical structure of otolaryngology is complex, making it difficult for nursing students to learn. In the past, there was insufficient cultivation of initiative among nursing students, which resulted in a sense of fatigue during learning and the inability to achieve ideal teaching goals<sup>[1]</sup>. The ladder teaching method is a progressive teaching method based on the foundation of nursing students and gradually increasing the difficulty of the taught content. By combining it with the case teaching method, the learning effectiveness can be greatly improved<sup>[2]</sup>. This is because case-based teaching makes up for the shortcomings of traditional teaching methods, and cultivates the learning interest and thinking ability of nursing students. Hence, nursing students possess a sense of immersion, helping them explore systematic knowledge, developing a deeper understanding of otolaryngology anatomy, and continuously enrich their nursing experience<sup>[3]</sup>. In this study, nursing students included in the otolaryngology department of our hospital were selected to analyze the feasibility of applying

the ladder and case teaching method.

## 2. Materials and methods

### 2.1. General information

Sixty nursing students enrolled in the Department of Otolaryngology (January 2022 to September 2023) were selected as the observation subjects. According to their admission time, the students were divided into a control group of 30 subjects aged 20–24 years old, with an average of  $22.13 \pm 0.86$  years. Eight subjects had a college degree, 17 had a bachelor's degree, and 5 with other qualifications. The observation group consisted of 30 subjects aged 21–24 years old, with an average of  $22.17 \pm 0.76$  years. Nine subjects had a college degree, 17 cases had a bachelor's degree, and 4 with other qualifications. There were no significant differences in the comparison of basic information between the two groups ( $P > 0.05$ ).

Inclusion criteria: (1) All nursing students are interns in the Department of Otolaryngology; (2) students with complete personal information; (3) actively cooperates with teaching. Exclusion criteria: (1) Students who do not comply with the questionnaire survey; (2) quit due to personal reasons.

### 2.2. Method

The control group adopted the conventional step-by-step ladder teaching method. Guided by the teaching outline and the teacher, the nursing students were first taught about various diseases and general nursing knowledge. As the students slowly familiarized themselves with the department and had more comprehensive knowledge, the students were then taught about operation methods.

The observation group adopted a combination of the ladder and case teaching methods. This teaching plan was developed for over 4 weeks. During the first week, training was provided to the students to familiarize them with the internal environment of the ear, nose, and throat. Basic disease knowledge and related nursing knowledge were also taught. The student's awareness of hospital infections and occupational exposure was increased so that they could learn how to properly avoid and report needle injuries. On the first Monday, the teacher provided one-on-one guidance to help nursing students learn basic methods such as nebulization inhalation, ear canal drops, and nasal irrigation. In the second week, multimedia explanations were conducted, combined with case studies to facilitate the memory of nursing students. For example, through a case of nasal irrigation, the teacher conducted operational demonstrations and guided nursing students in operational training, and provided training based on their mastery level. During the operation, meticulous learning was carried out to help nursing students master the details of the operation. Teachers used WeChat groups for teaching, making it easier for teachers to understand teaching resources, discuss teaching experiences, and engage in online discussions with students. According to the requirements of the teaching curriculum, micro lessons were prepared and distributed to the students. The learning tasks were shown to the students before class so they could generate their learning plan and record key and difficult contents. In addition, students were encouraged to organize their learning notes. A video of the teacher creating a specialized model of cutting and cutting tubes was played so the students could focus on the demonstration and discussion. In the third week, nursing measures for different diseases were taught through case examples so that students could raise questions and propose targeted plans.

By integrating theoretical knowledge with Internet technology, nursing plans can be proposed by the students and teachers can provide the necessary evaluation and guidance. During the fourth week, students were required to operate independently. They were required to explain and demonstrate their operational abilities to the teachers based on learned knowledge. Appropriate assessment and feedback were then provided to the

students at the end of the operation.

### 2.3. Observation indicators

The theoretical test was used to assess the theoretical score, with a total of 100 points. Practical exercises were used to evaluate the operational ability of nursing students, with a total of 100 points. A high score indicates a good assessment score. A self-designed teaching effectiveness survey scale was developed, which included subjective initiative, communication ability, analysis and induction, and learning interest. Each item scored 25 points, with high scores indicating high nursing quality <sup>[4]</sup>.

### 2.4. Statistical analysis

The SPSS 22.0 software was used for statistical analysis., the standard deviation of measurement data was expressed as mean  $\pm$  standard deviation and compared with the *t*-test. Count data were expressed as % and analyzed using the chi-squared ( $\chi^2$ ) test. Results were considered statistically significant at  $P < 0.05$ .

## 3. Results

### 3.1. Comparison of assessment results between two groups of nursing students

As shown in **Table 1**, the assessment scores of nursing students in the observation group were higher than those in the control group ( $P < 0.05$ ).

**Table 1.** Comparison of assessment scores between two groups of nursing students (mean  $\pm$  standard deviation, points)

Group	Cases, <i>n</i>	Theoretical score	Practical achievements
Observation group	30	96.21 $\pm$ 3.25	97.15 $\pm$ 2.05
Control group	30	88.54 $\pm$ 4.15	90.23 $\pm$ 3.85
<i>t</i>		6.212	5.268
<i>P</i>		0.001	0.001

### 3.2. Comparison of teaching effects between two groups of nursing students

As shown in **Table 2**, the observation group had higher scores in various aspects of teaching effectiveness for nursing students than that of the control group ( $P < 0.05$ ).

**Table 2.** Comparison of teaching effectiveness between two groups of nursing students (points)

Group	Cases, <i>n</i>	Subjective initiative	Communication skills	Analysis and induction	Interest in learning
Observation group	30	22.65 $\pm$ 1.85	24.02 $\pm$ 0.36	23.51 $\pm$ 0.85	24.36 $\pm$ 0.28
Control group	30	19.36 $\pm$ 1.56	20.25 $\pm$ 1.32	19.36 $\pm$ 1.28	19.65 $\pm$ 0.41
<i>t</i>		3.856	4.025	5.236	4.138
<i>P</i>		0.001	0.001	0.001	0.001

## 4. Discussion

The nursing work in otolaryngology is highly specialized and has a relatively complex anatomical structure. During nursing teaching, nursing students must master knowledge of diseases such as sinusitis, otitis media, and pharyngitis <sup>[5]</sup>. According to research, the structure of the ear, nose, and throat, as well as the head and neck, is

relatively unique <sup>[6]</sup>. After ear, nose, and throat injuries occur, timely treatment is needed to save the patient's life. Otolaryngology nurses should possess professional ethics and adaptability to quickly and accurately judge sudden illnesses <sup>[7]</sup>. The teacher should enhance the attractiveness of the course, stimulate the student's ability to explore and learn independently, increase knowledge, and enhance their communication skills. According to a survey, in the teaching of otolaryngology, it is necessary to help nursing students form a holistic concept and promote the comprehensive development of education in China <sup>[8]</sup>. The traditional teaching model only provides limited opportunities for students to speak up and teachers have a limited understanding of the learning process of students, making it difficult to implement personalized and targeted education. Studies have shown that when compared with traditional teaching methods, the microteaching method better improves the teaching quality <sup>[9]</sup>. Video teaching uses medical records as the foundation and based on the etiology and auxiliary examination information, it uses images to allow nursing students to intuitively observe the patient's condition. Compared with textbook content, it is more sentimental and can help students deeply remember what they learned. Case teaching facilitates the transition of nursing students towards the role of nurses, and encourages them to actively address problems by mobilizing positive factors learned. In some studies, a flipped classroom combined with the (tasked-based learning) TBL teaching model was adopted to provide a platform for nursing students to voice out so that their weaknesses in speaking can be identified and rectified. Through this, students can experience a rich teaching experience, while providing support in the student's learning journey, and providing new paths for teacher growth <sup>[10]</sup>. In clinical medical research, integrating TBL teaching with flipped classrooms promotes the comprehensive quality growth of nursing students and promotes advanced nursing guidance.

During practical teaching, it is necessary to cultivate the movement and operation abilities of nursing students so that students learn how to implement aseptic operations, avoid hospital infections, and prioritize occupational protection <sup>[11]</sup>. In the past, the teaching effect was average and the ideal teaching objectives were not achieved. Nursing students lack initiative in routine nursing lessons, making them drowsy in class and teachers are unable to stimulate their interest <sup>[12]</sup>. The ladder teaching method is a new teaching method that gradually increases the difficulty of the lessons. In addition, the combined case teaching method can greatly enhance the learning interest of nursing students, and cultivate their communication skills, and analytical and inductive abilities <sup>[13]</sup>. Ladder teaching refines the student's internship experience, further refining the daily teaching tasks of nursing students, and increasing their awareness of the learning process. Furthermore, the learning frequency of each stage was clarified and relevant knowledge was provided in advance, so that the internship progressed in an orderly manner, greatly enhancing the enthusiasm of nursing students for learning. This makes the teaching process more standardized and systematic <sup>[14]</sup>. Otolaryngology is a complex field that requires high levels of professional expertise. The ladder teaching model takes into account the actual situation of the department and provides a systematic and standardized teaching plan, enabling teachers to purposefully complete phased education and ultimately complete overall teaching <sup>[15]</sup>. Teachers were encouraged to establish scenarios for teaching and incorporate new cases to help nursing students intuitively understand the structure of the ear, nose, and throat. Based on mechanism learning, teachers should master their knowledge of otoscopy to better stimulate the interest of nursing students during teaching <sup>[16]</sup>. Multimedia tools can be utilized to assist teaching, combined with the ladder teaching mode, to help nursing students form healthy learning habits, stimulate their clinical thinking abilities, and cultivate their operational abilities. Results of this study showed that the assessment scores and teaching effectiveness of the observation group were higher than those of the control group. This indicated that the combined ladder and case teaching method was significantly more effective than conventional teaching.

## 5. Conclusion

The combination of the ladder and case teaching method in otolaryngology teaching improved the performance level of nursing students and enhanced teaching effectiveness. This teaching model has practical value and should be popularized.

## Disclosure statement

The authors declare no conflict of interest.

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