Impact of OBE-Based Multi-dimensional Interactive Teaching on the Comprehensive Quality of Clinical Nursing Students

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Abstract

Objective To explore the application effects of a multi-dimensional interactive teaching method based on the Outcome-Based Education (OBE) concept in cultivating the comprehensive quality and abilities of clinical nursing undergraduates. Methods According to the random number table method, 70 clinical nursing undergraduate interns were divided into a control group and an observation group, with 35 in each group. The control group received conventional clinical teaching, while the observation group adopted the multi-dimensional interactive teaching method based on the OBE concept. The teaching implementation period for both groups was one month. After implementation, the specialized theoretical knowledge and practical skills assessment scores of the two groups were compared, and their clinical nursing comprehensive quality and abilities were evaluated. Results After one month of implementation, the theoretical knowledge and practical skills scores of the observation group were higher than those of the control group ($P<0.05$); clinical instructors' evaluation of nursing students' clinical nursing comprehensive quality and abilities was also higher than that of the control group ($P<0.05$). Conclusion The multi-dimensional interactive teaching method based on the OBE concept, which conducts teaching through different dimensions and various interactive forms, effectively stimulates nursing students' learning interest, improves their mastery of specialized knowledge, and enhances clinical nursing comprehensive quality and abilities such as autonomous learning, clinical management ability, clinical nursing thinking, teamwork, and nurse-patient communication, and can be promoted and applied in clinical teaching practice.

Full Text

The Influence of Multi-Dimensional Interactive Teaching Under the OBE Concept on the Comprehensive Quality of Clinical Nursing Students

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Abstract

Objective To explore the application effect of multi-dimensional interactive teaching method based on the concept of Outcome-Based Education (OBE) in cultivating the comprehensive quality and ability of clinical nursing undergraduates. **Methods** According to the random number table method, 70 undergraduate clinical nursing interns were divided into a control group and an observation group, with 35 in each group. The control group received routine clinical teaching, while the observation group adopted multi-dimensional interactive teaching based on the OBE concept. The teaching implementation period for both groups was one month. After implementation, the specialized theoretical knowledge and skills operation assessment performance of the two groups were compared, and their comprehensive quality and ability in clinical nursing were evaluated. **Results** After one month, the theoretical and technical performance of the observation group was higher than that of the control group ($P < 0.05$). The evaluation of clinical nursing comprehensive quality and ability of nursing students was also higher than that of the control group ($P < 0.05$). **Conclusion** The multi-dimensional interactive teaching method based on the OBE concept, conducted through different dimensions and various interactive forms, can effectively stimulate nursing students' learning interest, improve their mastery of specialized knowledge, and enhance their comprehensive quality and ability in clinical nursing, including independent learning, clinical management ability, clinical nursing thinking, teamwork, and nurse-patient communication. This approach can be promoted and applied in clinical teaching practice.

Keywords: OBE concept; Multi-dimensional interactive teaching; Clinical nursing students; Comprehensive quality

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Clinical nursing internship is an essential pathway for nursing students to transition from school to clinical practice and represents a critical stage in cultivating innovative nursing talent [1]. However, traditional teaching methods primarily rely on one-way knowledge transmission from teachers to students, lacking interaction and practicality, which fails to effectively stimulate students' learning enthusiasm and initiative, resulting in suboptimal teaching quality [2-3]. The

OBE concept is outcome-oriented [4], breaking away from the traditional teaching design 思路 (approach) centered on teachers, textbooks, and knowledge. It integrates intended learning outcomes, teaching implementation processes, and evaluation of teaching effectiveness to achieve "integration of production and education." This approach encourages nursing students to independently carry out learning activities, cultivates their ability to think independently and solve problems, promotes cooperative learning among students to enhance teamwork and communication skills, and guides inquiry-based learning to stimulate curiosity and cultivate innovative thinking and problem-solving abilities.

The fundamental philosophy of multi-dimensional interactive teaching mode is student-centered, employing various forms of teaching interaction to stimulate learning interest and motivation, promote autonomous, cooperative, and inquiry-based learning, and facilitate active thinking, exploration, participation, practice, and cognition [5]. This article analyzes and summarizes the application effect of multi-dimensional interactive teaching mode based on the OBE concept in cultivating the comprehensive quality and ability of nursing undergraduates during clinical practice, as reported below.

1.1 Study Subjects

Seventy undergraduate nursing interns who practiced in the Department of Metabolic Endocrinology of a hospital between October 1, 2021, and October 31, 2023, were selected. **Inclusion criteria**: Four-year full-time nursing undergraduate background; Completion of relevant theoretical courses at school; No prior clinical nursing work experience before internship; Endocrinology department internship period of one month; Voluntary participation. **Exclusion criteria**: Early withdrawal from the study; Current psychological disorders. Using the random number table method, the 70 interns were divided into a control group and an observation group, with 35 in each group.

1.2.1 Control Group

The control group adopted traditional teaching methods. According to the teaching plan, instructors selected typical clinical cases, introduced theoretical knowledge, demonstrated correct nursing technical operation procedures and techniques with examples, and arranged practice sessions. Instructors provided guidance and feedback, answered questions encountered by students during practice, and deepened their comprehension and application of learned knowledge and skills.

1.2.2 Observation Group

The observation group adopted multi-dimensional interactive teaching based on the OBE concept.

1.2.2.1 Theory Teaching. (1) **Pre-class**: According to the nursing teaching plan, instructors selected typical clinical cases from the department to create

courseware and listed corresponding questions. Relevant materials were sent to students in advance through online platforms (such as QQ, Rain Classroom, Chaoxing Learning App, etc.), requiring them to actively search for information, conduct in-depth understanding and analysis of the knowledge domain, comprehensively organize cutting-edge knowledge, and make objective and accurate summaries. Simultaneously, they recorded unclear content to focus on during class. (2) **In-class**: A discussion and interaction-oriented teaching model was adopted. Teachers actively guided students to discuss and analyze problems presented in cases, combined with nursing teaching aids. Theoretical knowledge was closely integrated with skill operations and clinical practice, enabling students to deeply understand the clinical application of theoretical knowledge and continuously improve their nursing skill level in practice. This comprehensive training approach not only helps cultivate students' problem-solving abilities but also stimulates innovative thinking and develops independent thinking and problem-solving skills.

1.2.2.2 Workshop. Based on nursing skill operation standards, demonstration activities were organized once a week. Through practical operation and scenario simulation, students' skill operation ability and nurse-patient communication skills were cultivated, with emphasis on evaluation and feedback. Inappropriate operations were promptly corrected, and necessary guidance was provided to help them gradually improve their skill level, thereby promoting their professional growth and progress.

1.2.2.3 Standardized Teaching. According to weekly teaching objectives, instructors formulated corresponding teaching plans to ensure the standardization and effectiveness of the teaching process. During teaching, an approach of "letting go without losing sight" was adopted to guide students to actively participate in clinical nursing work, provide necessary guidance and support, emphasize supervision and evaluation, and provide timely feedback and guidance to assist in completing weekly goals.

1.2.2.4 Nursing Rounds. Conducted once a week. Students independently selected representative clinical cases, conducted in-depth exploration and analysis, and created rounds courseware. During courseware production, they also consulted relevant professional books and academic literature to ensure content accuracy and reliability. Finally, under the careful guidance of the head instructor, students jointly completed nursing rounds while closely monitoring key points and precautions during the rounds to demonstrate their professional competence and skills.

1.2.2.5 Health Education. Conducted once a week. Students independently selected education modes, such as group-based picture dialogue, simulated experience education, one-on-one education, and small lectures. Additionally, every Saturday, students participated in diabetes health education clinic shadowing activities, learning how instructors flexibly applied theoretical knowledge to clinical practice and how to effectively communicate with patients and their families.

1.3.2 Evaluation of Comprehensive Quality and Ability

A department-developed scoring scale was used to evaluate the comprehensive quality and ability of the two groups after implementing different teaching modes. The scale included five items: **Autonomous Learning Ability**: Assessed whether students possessed the ability to actively learn, independently solve problems, and self-reflect and improve in clinical practice. **Clinical Management Ability**: Evaluated students' organization, coordination, and communication abilities in clinical practice, as well as their patient management capacity. **Clinical Nursing Innovative Thinking Ability**: Examined students' ability to use innovative thinking to propose effective solutions when facing clinical problems. **Teamwork Ability**: Assessed students' communication and collaborative abilities in teams, observed whether they could actively integrate into the team, promote teamwork, and demonstrate good interaction, cooperation, and communication skills. Finally, it determined whether students could work together toward team goals, reflecting their team spirit. **Nurse-Patient Communication Ability**: Evaluated students' communication skills and techniques with patients and their families, and their ability to establish harmonious nurse-patient relationships. Each item had a maximum score of 20 points, with a total score of 100 points. Higher scores indicated better teaching mode effectiveness. By comparing scores of different teaching modes, we could further understand which mode was more conducive to improving students' comprehensive quality and ability.

1.4 Statistical Methods

Data were processed using SPSS 20.0 software. Measurement data were presented as (mean ± SD) and analyzed using t-tests; count data were expressed as number (%) and analyzed using ^{2} tests. $P < 0.05$ was considered statistically significant.

2.1 Comparison of General Data

All study samples were from the same school, and their general data such as gender and age showed no statistically significant differences ($P > 0.05$). See Table 1 for details.

Table 1 Comparison of General Data Between Two Groups of Nursing Students (mean ± SD)

Groupn	Gender (M/F)	Age (years)	Pre-internship Theory	Post-internship Theory	Pre-internship Operation	Post-internship Operation
Contrȣ5	1 (1,2)	21 (20,22)	68.03$±4.93	88.63±6.16	76.26±4.33	86.31±4.42

Observation | 35 | 2(1, 2) | 20(20, 22) |

2.2 Specialized Knowledge Mastery

Through comparative analysis of theoretical and nursing skill operation assessment scores before and after implementing different teaching modes, the observation group's post-internship scores were significantly higher than those of the control group (P < 0.05). See Table 2 for detailed data.

Table 2 Comparison of Assessment Scores Between Two Groups of Nursing Students

Group	Pre-internship Theory	Post-internship Theory	Pre-internship Operation	Post-internship Operation
Control68.03$±4.93|88.63±6.16|76.26±4.33|86.31±4.42||*Observation*|68.66±4.95|91.77±4.51|78.77±3.26|90.23				

2.3 Comprehensive Quality Ability

Evaluation of comprehensive quality ability at the end of the internship showed that the observation group scored significantly higher than the control group in autonomous learning, clinical management ability, clinical nursing innovative thinking, teamwork, and nurse-patient communication. The difference between the two groups was statistically significant (P < 0.05). See Table 3 for detailed data.

Table 3 Comparison of Comprehensive Quality Ability Assessment Scores Between Two Groups of Nursing Students

Group	Pre-internship Comprehensive Ability	Post-internship Comprehensive Ability	Clinical Nursing Innovative Thinking	Clinical Management Ability
Control61.26$±2.57|81.51±1.69|12(11, 12)|12(11, 13)|15(…)|*Observation*|66.17±2.07|92.97±$2.32				

Traditional clinical teaching methods for nursing students typically rely on one-way knowledge transmission from teachers, causing students to lack initiative and enthusiasm in the learning process. Cultivating innovative nursing talent requires self-thinking and problem-solving abilities as a foundation; teaching methods lacking these abilities cannot achieve good learning outcomes or meet the nursing discipline's demand for innovative talent. Therefore, existing teaching methods must be improved and perfected to better cultivate nursing innovation talent. Particularly in learning nursing practical skills, which is highly operational, some students often merely mechanically imitate instructors' operations without deep understanding of operation principles and techniques. When teaching operation procedures, instructors overemphasize proceduralization and accuracy while neglecting the cultivation of students' comprehensive abilities,

or find it difficult to address both aspects simultaneously. This situation seriously restricts students' comprehensive and healthy development [6,7] and fails to achieve expected teaching objectives. Therefore, to effectively enhance students' thinking sensitivity and problem discovery and resolution abilities, it is necessary to actively explore and practice more targeted teaching models on the basis of conventional teaching to better cultivate these abilities and lay a solid foundation for their future careers [7].

The OBE-based multi-dimensional interactive teaching method is a teaching approach that guides nursing students to conduct autonomous learning through clinical cases, emphasizing student-centeredness and improved learning effectiveness as goals. It focuses on the implementation effect of the teaching process while evaluating and providing feedback on teaching outcomes, closely integrating expected outcome goals, teaching implementation process, and teaching effectiveness evaluation. By reversely designing the teaching process, it improves teaching quality and effectiveness, forming a new educational philosophy [8-11]. This educational philosophy aims to achieve educational goals effectively by optimizing the teaching process and improving teaching effectiveness, providing useful reference for nursing education. During the teaching process, teachers deeply explore various resources to promote multi-dimensional collaboration and communication. By tapping into students' learning potential and stimulating their subjective initiative, students can jointly explore, research, and solve problems encountered in practice. Through this process, students continuously accumulate experience and knowledge, improve active learning ability, and cultivate innovative thinking to prepare for future clinical nursing work.

In weekly theory teaching, students actively learn courseware and search for relevant materials before class. During class, they form teams to conduct scenario simulations using clinical nursing practice sites to deepen understanding and application of theoretical knowledge. Under teacher guidance, promptly discovering and correcting their own mistakes is crucial for improving learning ability and level. Through continuous reflection and improvement, learning effectiveness and performance can be gradually enhanced. This learning method not only helps students master professional knowledge but also cultivates their autonomous learning and teamwork abilities. After class, they complete nursing record writing to timely integrate theory with clinical practice, thereby consolidating learned theoretical knowledge.

Additionally, multi-dimensional teaching activities such as nursing skill operation workshops, standardized teaching, nursing rounds, and health education effectively enhanced students' clinical adaptability. These activities not only provided opportunities for practical skill operation but also helped students better understand and respond to various situations in clinical work through simulated real scenarios. Through standardized teaching processes, students could learn standardized operation procedures to ensure they mastered correct methods. Nursing rounds gave students opportunities to participate in actual case discussions and learn disease treatment and nursing knowledge. Health

education activities provided opportunities for students to deepen professional knowledge and communicate with patients, helping consolidate and deepen their professional competence and improve nurse-patient communication skills.

This study's results show that applying OBE-based multi-dimensional interactive teaching in nursing clinical teaching, the observation group demonstrated significant advantages in specialized knowledge mastery, autonomous learning ability, nursing technical operation ability, clinical nursing thinking ability, teamwork ability, and nurse-patient communication ability ($P < 0.05$). Therefore, we recommend widely applying this clinical teaching method to effectively improve the clinical comprehensive quality of nursing undergraduates. However, OBE-based multi-dimensional interactive teaching faces some challenges and shortcomings. Teachers' and students' understanding and adaptation to this teaching method require time and training, necessitating adequate support and guidance. The teaching evaluation and feedback mechanism needs further improvement to ensure effective assessment and feedback on teaching effectiveness. Future research should continue to study and improve the method to enhance its effectiveness and sustainability, explore innovative teaching strategies, and improve the comprehensive quality and practical ability of nursing undergraduates.

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Note: Figure translations are in progress. See original paper for figures.