SPS-CTDI Dual-evaluation Model-oriented Nursing Undergraduate Gold Course Development and Implementation

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RESEARCH

SPS-CTDI dual-evaluation model-oriented nursing undergraduate gold course development and implementation

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Abstract

Objective: When applying the "golden lesson" concept to pediatric nursing teaching, under the condition that the two evaluation models support each other, study the application effect of the new teaching concept in the teaching process.

Method: Two classes of nursing major of 2018 were used as the golden lesson group and the tradition group. The tradition group used traditional teaching methods, and the golden lesson group used the "golden class" concept combined with the "Internet +" platform for teaching. After the course, compare the two groups of students' problem-solving scores and their theoretical and practical scores.

Results: The problem-solving ability of the students in the golden lesson group was better than the tradition group in terms of "negative problem orientation", "avoidance style" and "impulsive/negligence style" [(8.75±1.32VS12.59±4.7) points, (11.14±2.4) VS13.86±2.36) points, (8.59±2.55VS10.53±2.03)] (P<0.05).

Conclusion: This teaching mode conforms to the professional development characteristics of nursing students, helps to improve students' problem-solving ability and strengthens their thinking, but it also puts forward more requirements on teachers' teaching and practical experience.

Keywords: Nursing Education; Nursing Pediatrics; Golden Class; Double Evaluation of "SPS-CTDI"

Introduction

The implementation of China's second to third child policy will raise the demand for pediatricians in hospitals in the future. As a result, several universities and hospitals have made it a priority to improve the training of high-quality pediatric nursing talent. Given that our hospital has achieved some success in developing nursing talent through the technique of merging colleges and universities, it is especially important to update the "golden course" of pediatric nursing theory and practice instruction.

Chen Baosheng first proposed the concept of "golden course". In his exposition, he asked colleges and universities to reasonably increase the difficulty of courses, expand the depth of courses, expand the selectivity of courses, and require colleges and universities to comprehensively sort out the teaching content of each course and eliminate "Water class", create a "golden class", and effectively improve the quality of course teaching[1]. This study sets the effective participation of learners as the

principle of building a "golden lesson" [1, 2]. Because each student's cognitive level is different, and in order to create a good learning atmosphere, and to enable students at all levels to actively participate in classroom teaching, this study designed learning tasks that meet students at different levels. In specific teaching, we design not only difficult questions that require high-level thinking, but also problems that can be answered with low-intensity thinking. If the learner is in a high-level thinking tension stage for a long time, no matter who it is, he will feel tired of studying and even give up studying. In order to effectively stimulate learners' learning motivation when implementing the "Golden Lesson" teaching. This research designs one or two high-level questions in each classroom teaching, interspersed with several low-thinking activities during the period, which can not only enrich the classroom experience of students, but also maximize the participation of students of all thinking levels in classroom teaching. So that students can be at the same frequency as the instructor in the brain and thinking level, and resonate in the classroom.

It is also important to choose a suitable evaluation method. This study mainly uses the "SPS-CTDI" dual evaluation model to evaluate the teaching effect. The dual evaluation model is the Social Problem Solving Inventory (SPS) and the Critical Thinking Disposition Inventory (CTDI). At present, Facione's Critical Thinking Trait Scale is mostly used internationally. This scale is the only scale that can effectively measure the tendency of critical thinking traits in the world [3, 4]. It is not only suitable for people with any learning or social background, but also allows people to know the critical thinking tendency of the testee through relatively few test items. Revised by Chinese scholars to form a critical thinking ability measurement form (Chinese version) (Chinese version of critical thinking disposition inventory, CTDI-CV). The problem-solving ability questionnaire published by Andrew M.H. Siud in 2005 evaluates problem-solving ability and defects from the aspects of problem, problem-solving goal, solution strategy, and inspection effect [5, 6]. Based on this, this project combines the research of lau and luo [7, 8] to apply the two tables to the evaluation of the teaching results.

Materials and methods

Participants

Two classes of 2018 nursing majors from local colleges and universities in the autumn semester of 2019-2020 are selected as the experimental group and the control group. The control group (49 students) adopts traditional training mode, and the experimental group (51 students) adopts the golden lesson model to train, there were 100 people in the two groups, 12 boys and 88 girls, with an average age of (20.43 ± 0.56) years old. There was no statistical difference in age between the two groups ($P > 0.05$).

Teaching strategy

The training mode of the control group adopts the traditional mode. The students complete the pediatric nursing course in the school, and then carry out clinical practice in accordance with the established traditional training program. The experimental group adopts the following training models to prepare before class: 1. The preparatory tasks of the department are issued through the wisdom cloud vocational education platform. 2. Teachers set up open questions to guide students

to discuss by themselves; teaching in class: fully implement the concept of "Golden Lesson". Each class is set with multiple low-difficulty professional practice questions; at the same time, a high-difficulty case discussion question is set, so that students can fully discuss and form answers in their respective groups. Make all the senses of each student participate fully in the learning. When teaching clinical teaching content, change the conditions of the simple practical questions asked in the previous classroom to make the question slightly more difficult, increase the discussion time, and allow students to ask each other's questions. Inspire students to find the truth and exercise their analytical and reflective abilities.

Teaching evaluation and assessment

1.Question-solving ability questionnaire: In this experiment, we used the Chinese version of the question-solving ability questionnaire translated and simplified by mainland researcher lau[7]and others. The questionnaire contains 5 dimensions and a total of 25 items, each of which uses a 5-level scoring method, from "very consistent" to "not consistent" with 5 to 1 points in turn. "Negative problem orientation", "impulse/negligence style", and "avoidance style". The higher the score in these three dimensions, the more defects and deficiencies the respondent has in solving problems; the "positive problem orientation ability", "Rational Problem Solving Ability" has 5 items in each of the two dimensions, with a total score of 10-50 points. The higher the score, the better the respondent's ability to perceive problems;2.Pediatric Nursing Achievements: Two groups of students are assessed by a closed-book, and the test paper adopts a hundred-point system, and the test time and the teacher who revise the paper are the same;3.Pediatric clinical practice operation: the content of the assessment includes intravenous infusion, micro pump, intramuscular injection, subcutaneous injection, and aerosol inhalation;4.Teaching mode satisfaction questionnaire: It contains three levels of satisfaction, general and poor; 5.SPS and CTDI-CV were translated and revised by alinier[5], mainly from the three dimensions of cognitive thinking, rational thinking, and system thinking to evaluate. When the experiment is over, extract part of the content of the table and let the students self-evaluate. There are only two options for improvement and no improvement in each item. Choosing one of them will give up the other option. The purpose is to provide a basis for improving teaching methods in the future.

Statistics

Use R software to perform statistical analysis on the obtained data. The measurement data are in accordance with the normal distribution. The homogeneity of variance is expressed by the mean $\pm$ standard deviation. The comparison uses the t test of paired samples or independent samples. The comparison between groups uses the χ^2 test or Fisher exact probability method. $P < 0.05$ is considered statistically significant.

Results

There was no statistical difference between the two groups of students in gender and average grades at the time of entering the school ($p > 0.05$)(Table 1 and Figure 1).

In order to explore whether there is a difference in the problem-solving ability of the two groups of students before the experiment. We used SPSS to investigate the problem-solving ability of the two groups of students. The analysis results showed that the total scores and the scores of each dimension of the two groups of students' problem-solving ability questionnaires were not significantly different, and the differences were not statistically significant ($p < 0.05$) (Figure 2).

After the experiment, the two groups of students were evaluated using SPSS to compare the two groups of students' problem-solving ability. Data analysis shows that the three groups are significantly different in terms of "negative problem orientation", "avoidance style" and "impulse/negligence style". The experimental group is better than the control group ($P < 0.05$) (Figure 3).

Then we paid attention to the changes in the problem-solving abilities of the students in the experimental group before and after teaching. Therefore, we compared the scores of the simplified question-solving ability questionnaire of the experimental group students. There are significant differences in the dimensions "negative problem orientation", "positive problem orientation", "avoidance style" and "impulsive/negligence style". There is a statistical difference ($P < 0.05$) (Figure 4).

The corresponding ability of the control group students who use traditional teaching methods before and after the experiment still needs to be investigated. Therefore, the scores of the simplified question-solving ability questionnaires before and after the teaching of the control group were compared, in the dimensions "negative problem orientation", "rational problem solving", "positive problem orientation", "avoidance style" and "impulse/negligence style" shows no statistical difference. The result is shown in Figure 5.

At the end of this study, a combination of theoretical examination and operational examination was implemented to assess the knowledge system of the two groups of students. From the theoretical scores and operational scores of the students at the end of the experiment, it can be seen that the difference between the two groups is statistically significant ($P < 0.05$), as shown in Figure 6. At the same time, we also conducted a survey of teaching satisfaction. The teaching satisfaction of the experimental group was higher than that of the control group, and the difference was statistically significant ($P < 0.05$). See Table 2.

Through the combined use of the simplified Critical Thinking Ability Scale and the self-made evaluation table, the improvement of each item of the two groups of students before and after the experiment is found, which provides a basis for future teaching reforms. Self-made evaluation forms include improving team awareness, enhancing communication skills, improving learning enthusiasm, and promoting knowledge understanding. Short version of the critical thinking ability scale items: 1. Cognitive thinking; 2. Rational thinking; 3. System thinking. The size of the circle in the picture represents the number of people who choose the item, the darker the color, the more people choose (Figure 7).

Discussion

Currently, "golden class" and "water class" are two hot words in the field of higher education. Wu Yan[9] summarized the standards of "Golden Class" as: high-level, innovative and challenging. The teaching principles of this research are designed in

accordance with the golden class standard proposed by Wu Yan in "Building China's Golden Class", focusing on cultivating students' problem-solving ability and high-level thinking; at the same time, without losing the advanced nature, combined with internet equipment to increase student interaction. Combining teaching with on-line platforms, creating a multi-factor training model through multi-tasking, multi-cooperative group cooperation, etc., to develop students' problem-solving abilities and exercise their critical thinking; The most important thing is that this research has set up exploratory questions, so that students of different thinking levels can participate in learning. The hospital is one of the clinical teaching points of a certain medical college, and it has an extremely important clinical teaching mission. In the context of effectively "increasing the burden" on college students and creating a "golden class" to eliminate "water classes" [10], improving students' professional skills has become the focus of our clinical teaching work.

The "SPS-CTDI" dual-evaluation teaching model helps students improve their performance

From the perspective of the Golden Class, after passing the teaching reform, the experimental group students' theoretical and operational performance are better than those of the control group (83.29 ± 5.27 VS 78.94 ± 5.52 , 82.69 ± 4.82 VS 74.48 ± 5.76). This shows that the theoretical and practical levels of students have improved after experiencing the "Golden Lesson" teaching reform, especially the improvement in operational performance, which is consistent with the research results of other scholars who also integrate the "Golden Lesson" concept into teaching, See Figure 6, Table 2 for details.

The "SPS-CTDI" dual-evaluation teaching model helps students improve their problem-solving skills

In terms of problem-solving ability, there are significant differences in the three dimensions of negative problems, avoidance styles, and conflicting styles between the two groups of students, as shown in Figure 3. The lower the scores in these three dimensions, the stronger the student's problem-solving ability. For example, the items in negative questions mostly revolve around whether the testee sees the problem as a threat, whether he feels pessimistic about his ability to solve the problem, and is frustrated and upset when facing problems; the avoidance style items mostly revolve on whether the testee procrastinates, dependence, passivity, inaction; impulsive negligence style items mostly center around whether the testee is one-sided, impulsive, careless, flustered, etc. when solving problems [5]. Figure 3E is a graphical representation of the directional scores for negative problems. It can be seen intuitively that after a round of teaching reform experiments, students can avoid negative problems well. Moreover, the average score of the experimental group of students in this item is much lower than that of the control group, and the dispersion of scores is very small. If you focus on the problem-solving ability of the students in the experimental group before and after the experiment, this study finds that the scores of positive problem orientation are significantly different before and after the experiment (16.22 ± 4.62 VS 20.08 ± 3.66), as shown in Figure 4B. The positive problem-oriented items mostly revolve around whether the testee is actively

and not giving up when solving the problem. It can be seen that through this round of experiments, students in the experimental group can adjust their attitudes and are more willing to actively seek solutions to problems when facing problems.

Problems in the "SPS-CTDI" dual-evaluation teaching model

Although we have quantified the results of this research through the performance and problem-solving ability scale, we still don't know where we need to improve our work in the future. Therefore, we improve the information of teaching and feedback through the improvement of thinking ability. Refer to Figure 7, "Rational Thinking 1: Compulsory subjects in schools are a waste of time" item. Even students in the experimental group still feel that it is necessary for schools and teachers to improve the required courses in schools. See Figure 7 for details. This puts forward higher requirements for future teaching reforms. As a clinical teaching teacher in the new context, we should use information technology to improve teaching methods and strengthen curriculum innovation, which is also in line with the principle of "gender once" in the "golden class" standard.

Conclusions

Pediatric nursing is a medical clinical discipline with a solid theoretical and practical foundation. In clinical practice, medical personnel's subjects are children and their family members, thus they will face numerous challenges. Staff must handle temporary difficulties at all times, contact with children's families, and deal with difficult occurrences all at the same time. As a result, during the training process, we must concentrate on increasing students' problem-solving abilities. According to the findings of this study, the "SPS-CTDI" double-evaluation teaching method used in the golden class perspective can improve students' classroom participation, accommodate to students of different levels of thinking, stimulate students' high-level thinking, and cultivate their problem-solving skills. In order to fulfill the goal of developing pediatric nursing talents capable of dealing with clinical emergencies.

Appendix

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Funding

The theoretical exploration and practice of the "Internet + Pediatric Nursing" mixed teaching model under the golden class of Jiangsu Medical Vocational College Education Research Project (No.: L202001).

Abbreviations

SPS: the Social Problem Solving Inventory; CTDI: the Critical Thinking Disposition Inventory. Cognitive thinking 1: The essence of a thing is consistent with its appearance; Cognitive thinking 2: Personal experience is the only criterion for verifying truth; Cognitive thinking 3: I mostly follow the opinions on controversial topics and finally talk to me; Cognitive thinking 4: I will only look for some facts that support my opinion, but will not find some facts that oppose my opinion; Cognitive thinking 5: The decision made by a powerful person is the right decision; Cognitive thinking 6: The best way to solve problems is to ask others for answers; Cognitive thinking 7: It is impossible for me to express my opinions objectively; Rational thinking 1: Compulsory subjects in school are a waste of time; Rational thinking 2: thinking that foreigners should learn our culture instead of us to understand their culture; Rational thinking 3: I am panicked when dealing with complex problems; Rational thinking 4: I am not a very logical person, but often pretend to be logical; Rational thinking 5: I am afraid to find the truth about the facts when there are many problems; Rational thinking 6: people say that I am too impulsive in making decisions; Rational thinking 7: In group discussions, if someone's opinions are considered wrong by others, so I think he has no right to continue to express his opinions; System thinking 1: I am afraid to ask the teacher questions in class; System thinking 2: My attention is easily affected by the external environment; System Thinking 3: People think that I am hesitant to make a decision.

Availability of data and materials

The datasets generated and analysed during the current study are not publicly available due to the confidential nature of the content but are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

We confirm that all methods were carried out in accordance with relevant guidelines and regulations. The study was approved by the Ethics Committee of Yancheng Third People's Hospital (No. YCTPH-2019-16), and all students provided written informed consent to participate in this study. Besides, all the experiment protocol for involving humans was in accordance to Declaration of Helsinki.

Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable.

Authors' contributions

WY and WN contributed equally to this work. WN analyzed data. WY was a major contributor in writing the manuscript. ZYT performed the majority of follow-up. LYY is responsible for the data collection of the arrival part. All authors read and approved the final manuscript.

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Figures

Figure 1 Figure 1 Entrance score box diagram of the two groups of students, NS. indicates that there is no statistical difference in the scores of the two groups of students after the T test.

Figure 2 Figure 2 The SPS scores of the two groups of students before the experiment. A: rational problem solving score; B: positive problem score; C: avoidance style score; D: negligence/conflict style score; E: negative problem orientation score. NS. means there is no statistical difference. The P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

Figure 3 Figure 3 The two groups of SPS score chart, after the experiment. A: rational problem solving score; B: positive problem score; C: avoidance style score; D: negligence/conflict style score; E: negative problem orientation score. The P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

Tables

Figure 4 Figure 4 Comparison of the questionnaire score data of the students in the experimental group before and after teaching reform. A: Rational problem-solving score; B: Positive problem-oriented score; C: Avoidance style score; D: Negligence/conflict style score; E: Negative problem-oriented score. The P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

Figure 5 Figure 5 Comparison of questionnaire score data before and after teaching in the control group. A: Rational problem-solving score; B: Positive problem-oriented score; C: Avoidance style score; D: Negligence/conflict style score; E: Negative problem-oriented score. The P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

Figure 6 Figure 6 Comparison of the theoretical and operational scores of the two groups of students at the end of the research period. A.Theoretical results after the study;B.Practical performance after the studyThe P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

Figure 7 Figure 7 The questionnaire on the improvement of students' thinking ability after the experiment.

Table 1 Gender comparison of the two groups of students

Group	male	female
Experiment group	6	45
Control group	6	43
χ^2 value		2.37E-30
P value		1

Table 2 Comparison of teaching satisfaction between the two groups of students

	Excellent	Good	Bad
Experimental group	37	10	4
Control group	18	21	10
χ^2 value			13.003
P value			0.0015

Figures

Figure 1

Entrance score box diagram of the two groups of students, NS. indicates that there is no statistical difference in the scores of the two groups of students after the T test.

Figure 2

The SPS scores of the two groups of students before the experiment. A: rational problem solving score; B: positive problem score; C: avoidance style score; D: negligence/conflict style score; E: negative problem orientation score. NS. means there is no statistical difference. The P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

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Figure 5

Comparison of questionnaire score data before and after teaching in the control group. A: Rational problem-solving score; B: Positive problem-oriented score; C: Avoidance style score; D: Negligence/conflict style score; E: Negative problem-oriented score. The P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

A

B

Figure 6

Comparison of the theoretical and operational scores of the two groups of students at the end of the research period. A.Theoretical results after the study;B.Practical performance after the studyThe P value is represented by an asterisk, ***: 0; **: 0.001; *: 0.01

Figure 7

The questionnaire on the improvement of students' thinking ability after the experiment.