Exploration and Practice of Integrated Teaching in Middle and High School to Enhance Nursing Students' Caring Ability and Core Competencies

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Abstract: Objective: This study aims to evaluate the impact of the integrated teaching model in middle and high schools on nursing students' caring ability and core competencies, in order to provide empirical evidence for nursing education reform and explore new ideas and methods for cultivating high-quality nursing talents. Method: A quasi-experimental research design was adopted, randomly dividing 374 nursing students into an experimental group (176 people) and a control group (198 people). The experimental group adopted an integrated teaching model, while the control group used a traditional teaching model. Before and after the teaching intervention, the Caring Ability Scale and the Core Competency Scale for Registered Nurses were used to assess student abilities, and the theoretical exam scores and practical operation scores of both groups were collected for comprehensive evaluation. Results: Before the intervention, there were no statistically significant differences in various ability indicators between the two groups, indicating that the baseline levels of the two groups were comparable. After the intervention, the experimental group significantly outperformed the control group in indicators such as nursing caring ability, cognition, courage, patience, registered nurse competency, research ability, clinical nursing, leadership, interpersonal relationships, ethical and legal practice, professional development, and education and consultation ($p<0.05$). Additionally, the experimental group also achieved significantly better scores in 7 core courses and nursing operational skills compared to the control group. Although the median difference in anatomy scores did not reach statistical significance, the pass rate of the experimental group was slightly higher than that of the control group, with a chi-square test $P=0.017$ ($p<0.05$), indicating that the difference in pass rates for anatomy scores between the two groups was statistically significant. Conclusion: The integrated teaching model in middle and high schools can effectively enhance nursing students' caring ability and core competencies, positively impacting nursing education. This teaching model, through the close integration of theory and practice, improves students' learning interest and comprehensive abilities, providing a new method for cultivating nursing talents with high quality and a spirit of humanistic care.

Keywords: Integrated Teaching in Middle and High Schools, Nursing Education, Students' Caring Ability, Core Competencies

The "National Nursing Development Plan (2021-2025)" points out that there is a gap between nursing service supply and the diverse needs of the public, with weak service capabilities in grassroots medical institutions, urgently requiring an increase in the number of nurses and the expansion of nursing service connotations [1]. The nursing profession is listed as a national shortage talent profession, with a prominent global shortage of nursing personnel and severe imbalance in the doctor-nurse ratio. Against this background, the modern vocational education system emphasizes the organic connection between middle and high vocational education, enhancing students' comprehensive quality and cultivating high-skilled

comprehensive talents to meet the needs of medical institutions and improve students' employment rates [2]. The integrated training model for middle and high schools is of great significance for the sustainable development of vocational education and maintaining social stability, while also needing to construct a modern vocational education system that reflects the concept of lifelong education.

The nursing staff in secondary vocational schools are the main force in grassroots medical institutions. The nursing discipline urgently needs to cultivate compound nursing skill talents that meet grassroots needs, contributing to the construction of a healthy China. The caring ability and core competencies of nursing staff directly affect patient recovery and the quality of care, making them essential qualities. Foreign nursing schools have incorporated the cultivation of core competencies for nursing students into their teaching objectives, but domestic research shows that the core competencies and humanistic care abilities of nursing students still need improvement, necessitating deepening of teaching reforms.

Currently, although some scholars at home and abroad have explored the integrated training model and curriculum connection for secondary and higher vocational education, research on the integrated curriculum system for nursing professionals in this context mostly remains at the theoretical level, especially with few reports on the "3+2" integrated training curriculum system. Research on the impact of this model on nursing students' caring abilities and core competencies is also relatively scarce.

This study uses a quasi-experimental design to explore the impact of the integrated teaching model on the caring abilities and core competencies of nursing students in secondary and higher vocational education, assessing its effectiveness in nursing education, providing empirical evidence for nursing education reform, and offering new ideas for cultivating high-quality nursing talents.

1. Research Methods

1.1. Research Design

This study adopts a quasi-experimental research design, using a comparative method to assess the impact of traditional teaching models and integrated teaching models on students' caring abilities, core competencies, and other related indicators. The study sets up a control group and an experimental group, with the control group using the traditional teaching model and the experimental group using the integrated teaching model, and evaluations conducted before and after the teaching intervention.

1.2 Research Subjects

Control Group: A total of 198 students from classes 44-47 of the 2020 cohort of our school, using the traditional teaching model.

Experimental Group: A total of 176 students from classes 49-51 of the 2022 cohort, using the integrated teaching model.

Inclusion Criteria: The students and their parents (or guardians) must be informed and consent to participate in this study, voluntarily joining the research project, with no significant physical or psychological disabilities; students must be regularly attending classes without long-term absences (such as exceeding a certain number of hours due to illness or personal matters), ensuring they can fully receive the teaching intervention and participate in evaluations on time before and after the intervention, thus ensuring the integrity and validity of the data.

Exclusion criteria: There are serious learning disabilities (such as intellectual disabilities, reading disabilities, etc.) that may affect the understanding of teaching content and learning outcomes, thereby interfering with the accuracy of the comparison between the integrated teaching model and the traditional teaching model. There are serious psychological issues (such as depression, anxiety, etc.) that may affect their performance in the assessment of caring abilities and core competencies. During the teaching intervention process, individuals may withdraw from the study for personal reasons (such as transferring schools, dropping out, etc.), making it impossible to complete the entire teaching intervention and subsequent evaluation process.

1.3 Research Tools

1.3.1 General Information Questionnaire: Designed by the researcher, the content includes personal factors such as gender.

1.3.2 Care Ability Assessment

The care ability assessment is conducted using the Care Ability Scale, which was developed by American nursing scholar Nkongho in 1990 as a tool to evaluate the care ability of nursing staff. The scale includes three dimensions: cognition, courage, and patience, with a total of 37 items. The scale employs a 7-point Likert scoring method, assigning scores from 1 to 7 ranging from "strongly disagree" to "strongly agree." Among the 37 items, 13 require reverse scoring, with

higher scores indicating stronger care ability. The Cronbach's α coefficient for this scale is 0.84, while in this study, the Cronbach's α coefficient is 0.92.

1.3.3 Core Competency Assessment

The Chinese Registered Nurse Core Competency Scale is used, which was developed by Liu Ming from the Macao Polytechnic Institute's Nursing Department. This scale includes seven dimensions: critical thinking, clinical nursing, leadership, interpersonal relationships, ethics and legal practice, professional development, and education and training. It employs a 5-point Likert scoring method, with scores of 0 for no ability, 1 for basic ability, and 4 for high ability. There are no reverse scoring items in this scale. The overall reliability of the scale, measured by Cronbach's α, is 0.89, while in this study it is 0.95, indicating that it can reliably measure the core competencies of registered nurses.

1.4 Teaching Implementation

1.4.1 Control Group: Traditional Teaching Model

The teaching model of the control group follows the traditional segmented model of "theoretical teaching + practical teaching," executing the original talent training program during the vocational education stage and the higher vocational talent training program during the higher vocational stage. This model divides the teaching process into two main phases:

(1) Theoretical Teaching Phase: In this phase, students primarily learn the theoretical knowledge of the nursing profession systematically through classroom lectures, textbook study, discussions, and case analyses. This phase focuses on the imparting and understanding of theoretical knowledge, laying a solid theoretical foundation for the students.

(2) Practical Teaching Stage: After the completion of theoretical teaching, students enter the practical teaching stage. In this stage, students apply theoretical knowledge to practical operations through activities such as simulated laboratory operations, clinical internships, and skills training. Practical teaching focuses on cultivating students' clinical skills and operational abilities. By simulating clinical environments, students can practice and consolidate their nursing skills in a safe environment.

1.4.2 Experimental Group: Integrated Teaching Model

The experimental group adopts the "Teach-Learn-Do Integration" and "Theory-Virtual-Practice Integration" models, closely combining theory with practice to enhance the professional abilities of nursing students. The specific implementation strategies are as follows:

1.4.2.1 Establishing Organizational Structure: In 2022, the Nuclear Industry Health School signed a "Cooperative Education Agreement" with Changsha Health Vocational College to carry out a five-year integrated nursing program. A three-two segmented system is adopted, with the first three years at the Nuclear Industry Health School and the last two years at Changsha Health Vocational College. Both parties jointly formulate the talent training program and establish a leadership group and an implementation group to ensure the smooth execution of the teaching plan.

1.4.2.2 Establishing an Integrated Curriculum System for Secondary and Higher Vocational Education

(1) Clearly defined progressive training objectives: The secondary vocational stage focuses on basic courses and fundamental skills training, while the higher vocational stage emphasizes the deepening of professional knowledge and the enhancement of comprehensive practical abilities.

(2) Constructing a systematic and coherent curriculum system: Implementing modular design for courses, dividing nursing courses into four major modules: cultural, public foundation, professional foundation, and specialized courses. This ensures that the course content is systematic and coherent, with anatomy in the secondary vocational stage laying the foundation for learning in the higher vocational stage, achieving knowledge progression and avoiding repetition.

(3) Establishing unified curriculum standards: The two schools jointly formulate unified curriculum standards, clarifying the teaching objectives, content, methods, and evaluation for both secondary and higher vocational stages, ensuring the coherence of the curriculum system. Through six discussions, the talent training program for secondary and higher vocational education has been revised, including internships and course arrangements, establishing the "3+2" model aimed at enhancing students' core job competencies.

(4) Optimizing the structure of course content: Based on students' career development paths, the course content is divided into basic courses, core professional courses, and expanded courses. The course content is modularized, with each module corresponding to specific professional competency requirements. For example, in the nursing program,

courses can be divided into basic nursing modules, specialized nursing modules, and comprehensive nursing modules. The secondary vocational stage mainly completes the basic nursing module, while the higher vocational stage focuses on specialized nursing and comprehensive nursing modules.

(5) Sharing teaching resources: Secondary and higher vocational institutions cooperate to establish curriculum standards, ensuring teaching continuity through online and offline communication. Both parties establish a teacher exchange mechanism, with 54 teachers exchanged within two years, jointly training faculty, and co-building a teaching resource library to enhance teaching quality. To improve the efficiency of teaching resource utilization, both schools establish a resource sharing mechanism covering textbooks, courseware, and practical training resources. Cooperation optimizes resource allocation, establishing a nursing professional teaching resource library, and applying for a national nursing professional resource library in 2023. By March 2025, the resource library serves 12.7665 million users, with 51 courses launched, 4021 original teaching materials created, and an originality rate of 82.57%. The school-enterprise cooperation has developed six dual-system textbooks, integrating vocational qualification assessments, allowing students to obtain academic certificates while also acquiring vocational qualification certificates, such as the nursing practice qualification.

(6) Constructing an Integrated Evaluation System: An evaluation system covering the entire profession is established to break the evaluation barriers between secondary vocational education and higher vocational education. The "Management System for Evaluation of Integrated Teaching between Secondary and Higher Vocational Education," the "Implementation Plan for Mid-term Inspection of Integrated Teaching between Secondary and Higher Vocational Education," and the "Implementation Plan for Assessment of Transition between Secondary and Higher Vocational Education" have been formulated.

1.5 Evaluation Methods

1.5.1 Assessment of Caring Ability and Core Competencies

Using a questionnaire survey method, assessments were conducted on two groups of students at the beginning of the first semester and after the sixth semester internship, utilizing the Caring Ability Scale and the Core Competency Scale for Registered Nurses in China to understand the caring ability and core competencies of both groups before and after implementation.

1.5.2 Comprehensive Teaching Effectiveness Assessment

(1) Theoretical Assessment: After the course concludes, a unified closed-book examination will be organized to assess seven core courses: Human Anatomy, Basic Physiology, Nursing Pharmacology, Internal Medicine Nursing, Surgical Nursing, Obstetrics and Gynecology Nursing, and Pediatric Nursing. The total score is 100 points, with 60 points as the passing mark, to evaluate the theoretical performance levels of both groups of students.

(2) Practical Skills Assessment: Before the end of the fourth semester, practical abilities will be assessed through simulated clinical operation examinations, including projects such as cardiopulmonary resuscitation, aseptic techniques, oxygen administration, and vital signs measurement. Two teachers will independently score the assessments, and the average score will be taken, with a full score of 100 points, to evaluate the practical skills levels of both groups of students.

1.6 Statistical Methods

When comparing the differences in caring ability and core competencies between the two groups, independent sample t-tests or Mann-Whitney U tests will be selected based on the characteristics of the data distribution. When comparing the comprehensive teaching effectiveness assessments between the two groups, the collected data will be entered into an Excel spreadsheet after double-checking, and SPSS 23.0 software will be used to organize the data. Multivariate analysis will be employed to compare the differences in scores between the two groups, and the pass rate will be analyzed using the chi-square test. For missing data, multiple imputation methods will be used to ensure the reliability of the analysis results. A significance level of $P<0.05$ will be considered statistically significant.

1.7 Ethical Guidelines

To ensure the rights of the research subjects, the purpose and details of the study were clearly explained before the initiation of the research, and consent was obtained from the participants and their guardians. The collected information will be processed anonymously and will only be used for this study. Participants have also been informed that the relevant data will be destroyed three years after the completion of data

collection. Subsequently, questionnaires will be distributed to the consenting participants, who will fill them out independently. The questionnaire completion process will be conducted anonymously, emphasizing the principle of voluntary submission. Students who do not wish to participate have the right to choose not to submit the questionnaire.

2 Results

2.1 General Characteristics of Research Subjects

The initial sample of this study included 374 nursing students, with 176 in the experimental group and 198 in the control group. During the experiment, due to reasons such as dropout, a total of 371 students completed the comprehensive test (174 in the experimental group and 197 in the control group). In the questionnaire survey phase, a total of 348 valid questionnaires were collected (158 from the experimental group and 190 from the control group), resulting in a validity rate of 93.8%. Among all participants, there were 18 males (5.77%) and 294 females (94.23%). This gender distribution reflects the characteristic of a higher proportion of females among nursing students.

2.2 Comparison of Humanistic Care Ability and Core Nursing Ability of Two Groups of Students Before Integrated Teaching Implementation

Before the implementation of integrated teaching, a questionnaire survey was conducted on the care ability and core ability of the two groups of students. The survey showed that there were no statistically significant differences ($p>0.05$) between the two groups in terms of nurse care ability, cognition, courage, patience, registered nurse ability, research ability, clinical nursing, leadership, interpersonal relationships, ethics and legal practice, professional development, education, and consultation before the experiment began, indicating that the baseline levels of the two groups of students were comparable (see Table 1 for details).

Table 1 Comparison of Humanistic Care Ability and Core Nursing Ability of Two Groups of Students Before Implementation

Indicator	Group		*t*	p
	Control Group (N = 190)	Experimental Group (N = 158)		
Nursing Care Ability	161.76±14.65	162.34±12.89	-0.366	0.714
Cognition	56.83±5.54	56.53±4.92	0.492	0.623
Courage	52.48±4.48	52.65±4.39	-0.322	0.748
Patience	52.44±9.24	53.16±8.33	-0.709	0.479
Nurse Core Competencies	201.78±42.4	201.02±43.9	0.154	0.878
Research Ability	34.08±7.29	34.09±7.26	-0.021	0.983
Clinical Nursing	30.6±6.93	30.36±7.2	0.301	0.764
Leadership Ability	35.34±7.42	35.36±7.66	-0.020	0.984
Interpersonal Relationships	27.88±6.03	27.63±6.37	0.341	0.733
Ethics and Legal Practice	28±6.14	27.84±6.36	0.218	0.828
Professional Development	20.02±4.65	20.77±4.81	-1.381	0.168
Education and Consultation	25.86±5.12	24.96±5.38	1.501	0.134

2. 3 Comparison of Humanistic Care Ability and Core Nursing Ability Before and After Integrated Teaching for the Control Group Students

In this study, the control group students were assessed for their humanistic care ability and core nursing ability before and after receiving integrated teaching. The results showed that the control group students had significant improvements in key indicators such as nursing care ability, cognition, courage, patience, registered nurse ability, clinical

nursing, interpersonal relationships, ethics and legal practice, professional development, and education and consultation ($p<0.05$). Although the improvement in research ability and management ability did not reach statistical significance (research ability: $t=-1.799$, $p=0.074$; management ability: $t=-1.644$, $p=0.102$), the average scores after the experiment (research ability: 35.52±8.74; management ability: 36.68±8.67) still showed a positive trend. These results indicate that the integrated teaching model for middle and higher vocational education has a positive effect on enhancing nursing students' care ability and core competencies, providing empirical support for the application of this teaching model in nursing education (see Table 2).

Table 2 Comparison of Humanistic Care Ability and Core Nursing Ability Before and After Integrated Teaching for the Control Group Students

Indicator	Control group		t	p
	Before Implementation	After Implementation		
Nursing Care Ability	161.76±14.65	169.3±12.39	-5.514	<0.001
Cognition	56.83±5.54	59.97±7.93	-4.446	<0.001
Courage	52.48±4.48	54.53±3.45	-5.219	<0.001
Patience	52.44±9.24	54.8±5.81	-3.050	0.003
Nurse Core Competencies	201.78±42.4	214.88±49.77	-2.818	0.005
Research Ability	34.08±7.29	35.52±8.74	-1.799	0.074
Clinical Nursing	30.6±6.93	32.45±7.8	-2.521	0.013
Leadership Ability	35.34±7.42	36.68±8.67	-1.644	0.102
Interpersonal Relationships	27.88±6.03	29.27±7.04	-2.089	0.038
Ethics and Legal Practice	28±6.14	30.27±7.06	-3.398	0.001
Professional Development	20.02±4.65	23.6±5.44	-7.038	0.001
Education and Consultation	25.86±5.12	27.08±6.28	-2.091	0.038

2. 4 Integrated Teaching Implementation in the Experimental Group: Comparison of Humanistic Care Ability and Core Nursing Ability Before and After

In this study, an assessment of humanistic care ability and core nursing ability was conducted for students in the experimental group before and after receiving integrated teaching. The indicators covered aspects such as nurses' caring ability, cognition, courage, patience, registered nurse capability, research ability, clinical nursing, leadership, interpersonal relationships, ethics and legal practice, professional development, and education and consultation. The results showed that students in the experimental group significantly outperformed the control group on all indicators ($p<0.05$), indicating that integrated teaching across vocational and higher education can significantly enhance nursing students' caring ability and core competencies, providing strong support for the application of this teaching model in nursing education (see Table 3 for details).

Table 3 Comparison of Humanistic Care Ability and Core Nursing Ability Before and After Implementation in the Experimental Group

Indicator	Experimental Group		*t*	p
	Before Implementation	After Implementation		
Nursing Care Ability	162.34±12.89	175.69±11.11	-8.973	<0.001

Cognition	56.53±4.92	63.25±5.74	-9.789	<0.001
Courage	52.65±4.39	56.12±3.35	-7.279	<0.001
Patience	53.16±8.33	56.32±6.66	-3.470	0.001
Nurse Core Competencies	201.02±43.9	231.87±54.22	-4.861	<0.001
Research Ability	34.09±7.26	38.39±9.44	-3.947	<0.001
Clinical Nursing	30.36±7.2	34.34±8.46	-3.921	<0.001
Leadership Ability	35.36±7.66	38.86±9.45	-3.173	0.002
Interpersonal Relationships	27.63±6.37	32.31±7.54	-5.245	<0.001
Ethics and Legal Practice	27.84±6.36	32.69±7.64	-5.405	<0.001
Professional Development	20.77±4.81	25.65±5.75	-7.068	<0.001
Education and Consultation	24.96±5.38	29.63±6.79	-5.949	<0.001

2.5 Comparison of Humanistic Care Ability and Core Nursing Ability between Two Groups of Students after Implementing Integrated Teaching

This study compares the humanistic care ability and core nursing ability of two groups of students after implementing integrated teaching. The results indicate that the experimental group significantly outperformed the control group in key indicators such as nursing care ability, cognitive ability, courage, patience, registered nurse ability, research ability, clinical nursing, leadership ability, interpersonal relationships, ethical and legal practice, professional development, and education and consultation ($p<0.05$). These findings support the application of the integrated teaching model in nursing education, providing empirical support for its effectiveness in enhancing students' comprehensive abilities (see Table 4 for details).

Table 4 Comparison of Humanistic Care Ability and Core Nursing Ability between Two Groups of Students after Implementing Integrated Teaching

Indicator	Group		t	p
	Control Group (N = 190)	Experimental Group (N = 158)		
Nursing Care Ability	169.3±12.39	175.69±11.11	-4.761	<0.001
Cognition	59.97±7.93	63.25±5.74	-4.235	<0.001
Courage	54.53±3.45	56.12±3.35	-4.050	<0.001
Patience	54.8±5.81	56.32±6.66	-2.134	0.034
Nurse Core Competencies	214.88±49.77	231.87±54.22	-2.859	0.005
Research Ability	35.52±8.74	38.39±9.44	-2.758	0.006
Clinical Nursing	32.45±7.8	34.34±8.46	-2.027	0.044
Leadership Ability	36.68±8.67	38.86±9.45	-2.100	0.037
Interpersonal Relationships	29.27±7.04	32.31±7.54	-3.644	<0.001
Ethics and Legal Practice	30.27±7.06	32.69±7.64	-2.875	0.004
Professional Development	23.6±5.44	25.65±5.75	-3.202	0.002
Education and	27.08±6.28	29.63±6.79	-3.421	0.001

Consultation

2.6 Evaluation of Comprehensive Teaching Effectiveness of Two Groups of Students

This study employed non-parametric testing methods to compare the differences in scores of students in the experimental group and the control group under the integrated teaching model for middle and higher vocational education across seven core courses and nursing practical skills. The results showed that the experimental group significantly outperformed the control group in key indicators such as basic physiology, nursing pharmacology, internal medicine nursing, surgical nursing, obstetrics and gynecology nursing, pediatric nursing, and practical skills ($p<0.05$). Although the median score difference in human anatomy between the two groups did not reach statistical significance ($Z=0.659$, $p=0.509$), the pass rate of the experimental group (86.96%) was higher than that of the control group (77.50%), and the chi-square test indicated that the difference in pass rates for anatomy between the two groups was statistically significant ($p=0.017$, <0.05). These results suggest that the integrated teaching model for middle and higher vocational education can effectively enhance students' comprehensive abilities, providing strong support for its application in nursing education (see Table 5, Table 6).

Table 5 Evaluation of Comprehensive Teaching Effectiveness of Two Groups of Students

Exam Subjects	Experimental Group (N = 174)	Control group (N = 197)	Z	p
Human Anatomy	68.00 (61.00 - 76.00)	70.00 (60.00 - 81.00)	0.659	0.509
Fundamentals of Physiology	80.73 (71.70 - 87.00)	63.84 (60.00 - 75.12)	9.285	0.000
Nursing Pharmacology	82.00 (73.00 - 87.50)	72.00 (60.00 - 80.00)	6.151	0.000
Internal Medicine Nursing	85.30 (78.94 - 90.34)	73.40 (64.00 - 80.50)	9.987	0.000
Surgical Nursing	91.50 (86.65 - 94.45)	79.00 (72.30 - 85.10)	11.070	0.000
Obstetrics and Gynecology Nursing	75.15 (65.70 - 79.70)	72.00 (64.00 - 78.00)	2.142	0.032
Pediatric Nursing	85.50 (79.00 - 91.00)	67.00 (60.00 - 76.00)	11.2433	0.0000
Operational Skills	94.20 (90.00 - 96.20)	82.00 (73.00 - 89.00)	11.2991	0.0000

Table 6 Comparison of the pass rate of anatomy between the two groups of students

(N = 174)			
	Value	Degrees of freedom	P
Pearson Chi-square	5.732°	1	0.017

3. Discussion

This study aims to evaluate the impact of the integrated teaching model on the caring ability and core competencies of nursing students. The results indicate that this teaching model significantly enhances students' abilities across multiple key indicators, which has important implications for the field of nursing education.

3.1 The integrated teaching model between secondary and higher vocational education can effectively enhance nursing students' caring abilities and core competencies.

Before the intervention, a survey was conducted on the caring abilities and core competencies of two groups of students. The survey showed that there were no statistically significant differences in various ability indicators between the experimental group and the control group, indicating that the baseline levels of the two groups of students were comparable before the experiment began, thus ensuring the reliability of the research results. After the experiment, the control group students showed significant improvements in multiple indicators, which may be attributed to the traditional teaching model, which, over time and with the accumulation of teaching experience, can also enhance students' abilities to a certain extent. However, the improvements in the experimental group were more pronounced, especially in key indicators such as nursing caring ability, cognition, courage, patience, registered nurse competency, research ability, clinical nursing, leadership, interpersonal relationships, ethics and legal practice, professional development, and education and consultation. This indicates that the integrated teaching model between secondary and higher vocational education can not only enhance students' foundational levels but also gradually optimize their humanistic caring abilities and core competencies, forming a virtuous cycle.

These results indicate that the integrated teaching model between secondary and higher vocational education can effectively enhance nursing students' core competencies, particularly in caring abilities and professional development.

3.2 The integrated teaching model between secondary and higher vocational education can effectively enhance students' theoretical and practical skills.

The research results indicate that the experimental group students performed significantly better than the control group in theoretical and practical skills assessments, especially in key courses such as basic physiology, nursing pharmacology, internal medicine nursing, surgical nursing, obstetrics and gynecology nursing, pediatric nursing, and practical skills. Although the median difference in anatomy scores did not reach statistical significance, the pass rate of the experimental group was slightly higher than that of the control group, with a P-value of 0.017 from the chi-square test, indicating that the difference in pass rates for anatomy scores between the two groups was statistically significant. This further proves the effectiveness of the integrated teaching model between secondary and higher vocational education in improving students' basic skills and knowledge mastery.

This result provides theoretical support for practical applications and serves as a reference for educators in designing related courses. Future research can further explore how this model can be integrated with nursing education practices to better serve the development of nursing education.

4. Conclusion

The results of this study are consistent with existing literature on the impact of teaching models on enhancing nursing students' abilities [12, 13]. Multiple studies have demonstrated that more comprehensive and practical teaching models can better prepare students to face challenges in real work settings. This study further confirms this and emphasizes the effectiveness of the integrated teaching model between secondary and higher vocational education in enhancing nursing students' caring abilities and core competencies. The results of this study provide strong evidence to support the application of the integrated teaching model in nursing education. This teaching model can effectively enhance nursing students' caring abilities and core competencies, providing new ideas and methods for cultivating high-quality nursing talent.

In summary, the integrated teaching model between secondary and higher vocational education has shown significant effectiveness in enhancing nursing students' humanistic caring abilities and core competencies, and its potential for promotion can be verified through practical cases in the future.

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