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Problems and Countermeasures in Computer-Assisted Nursing Teaching and Learning

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Abstract. In order to explore the application effect of scenario simulation combined with computer-assisted instruction (CAI) in orthopedic nursing practice and provide a basis for further teaching promotion, problems and countermeasures in computer-assisted nursing teaching were put forward. 120 undergraduate intern nursing students from a medical university were randomly selected and divided into an experimental group and a control group of 60 students each; the experimental group used scenario simulation combined with CAI teaching, and the control group used traditional teaching. After the internship, the internship theory test with unified propositions, the Chinese version of the Exploratory Factors of Nursing Student Core Competency Scale (CINS), and the Nursing Practice Teaching Satisfaction Questionnaire were conducted to evaluate the effectiveness of the internship. The experimental results show that: there is no statistically significant difference in the theoretical performance of the experimental group and the control group; the critical thinking, general clinical skills and lifelong learning scores of the core competency scale of the experimental group are higher than those of the control group; the teaching satisfaction of the experimental group is better than that of the control group ($P<0.05$). Conclusion: Scenario simulation combined with computer-assisted teaching can effectively solve the teaching contradiction of insufficient clinical practice opportunities, and has a good effect on improving students' learning autonomy, comprehensive ability and teaching satisfaction.

Keywords. computer-assisted instruction, scenario-based simulation, integrative competencies, nursing

1. Introduction

Computer-assisted instruction (CAI) uses a variety of media such as graphics, text, audio, and video to realize the teaching process in an optimized way under the effective control of advanced computers. It can select various forms of teaching media according to different teaching contents and teaching objectives, build a computer control system for teaching information transmission and feedback adjustment, and promote students' deep understanding of system theory and practice in an intuitive, vivid and vivid way. Perceptual understanding of operations to achieve the purpose of improving classroom teaching effects [1]. CAI further enriches and diversifies teaching activities, making up for the shortcomings of "a piece of chalk, a wall chart, a blackboard, and a textbook"

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that cannot give students a variety of perceptions, turning nursing theoretical knowledge from static to dynamic, and from abstract to concrete, turning difficulties into easy ones, stimulating students' learning interest and knowledge potential, thereby achieving better teaching results [2]. Students' abilities and knowledge backgrounds vary. CAI can solve the problem of students' individual differences affecting the teaching effect through human-computer interaction, repeated playback, collective teaching and individual teaching. In particular, CAI can provide targeted individual tutoring without being limited to the existing teaching progress and depth, and can adapt to the needs of students at all levels [3].

CAI not only changes the role of teachers from simply teaching knowledge to designing teaching materials, organizing and regulating teaching, but also enables students to actively participate in teaching activities behaviorally and emotionally, mobilizing all senses for active learning, thereby developing potential, promoting intellectual development and The improvement of logical thinking ability is conducive to teaching students in accordance with their aptitude and developing students' individual strengths, thereby fully mobilizing students' autonomy, reflecting their dominant position in learning, and greatly improving classroom efficiency. Therefore, multimedia computer-assisted instruction has become an inevitable choice for modern education [4].

2. Literature review

Computer multimedia uses digital video, sound, animation, pictures and text to present information, and uses a variety of forms to conduct visual teaching, allowing students to establish a comprehensive, multi-sensory, visual and multi-dimensional knowledge system. This kind of organically combines computers with The method of integrating computers into teaching to give full play to the potential advantages of computers and achieve good results is called Computer Assisted Instruction (CAI). This teaching system organically organizes teachers, media, students, and teaching content together to form an optimized teaching environment. Tsai, M. J. and others pointed out that multimedia computers can be used as a tool for undergraduates to use computer-based learning (CBL) courses. CBL has become an integral part of undergraduate medical courses, and graduate students and professionals have also used CBL to learn knowledge. become possible [5]. In the United States, as nurses who are far away from universities require higher degree education, communities and health centers also require more nurses with higher degrees to take on important responsibilities. Some people have also suggested that a better way to solve this problem is to develop Distance nursing education [6].

At present, developed countries have set up an online teaching system in nursing education, the use of network technology, the core curriculum of nursing and related courses on the Internet, through the Internet to students around the online teaching, while providing students with lectures, course materials and references; the course involves institutions and need to know the rest of the contents of the course into hyperlinks and set up the assessment of the contents of the both convenient and effective. In foreign countries, online teaching has received a better effect, the relevant researchers on the acceptance of distance education and traditional education methods of the effect of comparative study, found that the acceptance of traditional education

methods and acceptance of distance education methods of students' examination results are not statistically different [7].

In the orthopedic nursing internship, this paper carries out the scenario simulation combined with computer-assisted teaching, changes the traditional teaching of the past dull into a richer "five-step" teaching method, and explores the application effect of the scenario simulation combined with computer-assisted teaching in orthopedic nursing internship.

3. The research methodology

3.1. The subject of the study

3.1.1 Inclusion criteria

In 2015-2016, 120 nursing students, including 113 females and 7 males, aged 22.39 ± 1.32 years, interned in the orthopedic department of the First People's Hospital of a certain province, and were randomly divided into 60 each in the experimental group and the control group. Internship nursing students have been systematically received formal nursing undergraduate teaching, in which the "Surgical Nursing" femoral neck fracture clinical symptoms and treatment modalities have a basic understanding of the orthopaedic nursing course has the ability to learn [8].

3.1.2 Establishment of the assessment team and the development of the teaching plan

By the first people's hospital in the province with experienced nursing education management surgical area nurse leader 1 person, surgical area nursing research team leader 1 person and orthopedic head nurse 3 people, composed of this teaching assessment team, undertake the scenario simulation case writing, teaching teachers access assessment and teaching effect assessment [8].

3.1.3 Inclusion criteria for lead teachers

①Orthopedic nurses who have obtained the nurse practitioner certificate in our hospital; ②Working in our hospital for more than 10 years; ③Bachelor degree or above, with professional title of nurse or above; ④Working in orthopedics for more than 5 years; ⑤2 years or more of clinical teaching experience; ⑥The CAI courseware production and teaching by the teaching teacher passed the review of the trial lecture by the assessment team [9].

3.1.4 Video package production standards

The highest ranked teachers are selected to produce a video package of operational skills as a learning resource through trial lectures and skill demonstrations.

3.1.5 Class scheduling

Orthopaedic teaching lasted for 4 credit hours and was conducted in a semi-discharge format. Surgical Nursing (5th edition) published by the People's Health Publishing House was used as the teaching material [10].

3.1.6 Teaching steps

Hip arthroplasty" is used as an example for comprehensive teaching.

3.1.6.1 Pre-reading

Strengthen independent learning ability; use the free database of our hospital library as the base, "Surgical Nursing" as the guiding textbook to collect teaching materials, and the electronic medical record of a certain hip postoperative patient as the guide to master the causes, treatment principles, and Nursing strategies and related health guidance [11]. In addition, the patient was taught to guide patients in thrombosis prevention rehabilitation exercises and ankle pump exercise rehabilitation training. Finally, a presentation (PPT) was produced with references marked, and outstanding works were selected for display during the teaching session.

3.1.6.2 Authorization

To strengthen life-learning ability; department teachers select real cases and produce PPT, pictures, three-dimensional animations and physical objects to systematically demonstrate the relevant knowledge of hip replacement for nursing rounds [12]. Brainstorming teaching was conducted after class: discussing how hospitals, communities and families can take preventive measures against hip fractures, combined with searching for the latest scientific and technological cutting-edge knowledge, and connecting tough professional knowledge with soft knowledge closely related to life. Really integrate theory with practice.

3.1.6.3 Exercises

Strengthening the technical learning ability; making teaching video process with "Axial Turning Method after Hip Arthroplasty". Teachers select real cases, on-site demonstration, high simulation simulators, triangular pillows, pillows, traction frames, pipelines and other equipment set up simulation scenarios, two groups of people to operate exercises. Teachers give timely guidance, so that everyone mastered [13]. The teaching video was compiled into the hospital's "nurse skills operation 50" video collection, which was included in the training of the whole hospital nurses, and comprehensively improved the overall technical level of nurses.

3.1.6.4 Operations

Enhance the practical learning ability; each group of two people for operation demonstration, in the process of operation to improve the mature and complex practice scenarios, to provide a comfortable position, awareness of skin protection, patient nutritional assessment, preventive measures for thrombosis and prevention of subluxation guidance, all and case-related content can be added to it, so as to achieve openness, authenticity, and global understanding . During the operation process, the instructor assessed the comprehensive ability according to the core competence table exploring factors, and only after passing the operation could the patient be operated individually in the clinic under the guidance of the instructor.

3.1.6.5 Appraisal

Comprehensive ability assessment and assessment. On-site "three-dimensional" evaluation of teaching effectiveness: theoretical assessment, core competency [refer to the Chinese version of the Core Competency Scale for Nursing Students (CINS)] evaluation and nursing students' satisfaction with teaching. Theoretical examination papers and teaching satisfaction questionnaires were distributed at the same time, with

a recovery rate of 100%, and the "Five Steps" achieved the comprehensive teaching goals.

3.1.6.6 Statistical methods

Data processing used SPSS 21.0 software, usingχ^2 Test, P<0.05 was considered as a statistically significant difference.

4. Analysis of results

4.1. Results

Table 1. Comparison of theory scores of nursing students in two groups ($\bar{x}\pm s$)

Groups	Number of persons	Theoretical performance
The test group	60	93.23±2.16
Control group	60	93.40±1.87

Table 2. Core competency scores of nursing students in both groups ($\bar{x}\pm s$)

Groups	Number of persons	Clinical Biomedical Sciences	critical thinking	Concern	Ethics and Responsibility	general clinical skills	Lifelong Learning
The test group	60	28.16±2.93	17.13±3.43	20.45±2.02	74.06±1.17	36.30±5.09	34.16±3.25
Control group	60	26.51±3.52	15.71±2.75	19.23±2.63	74.45±1.36	31.36±2.74	23.25±4.67
P		0.363	0.018	0.256	0.860	0.001	0.007

Table 3. Comparison of teaching satisfaction scores between the two group

Groups	Number of persons	Satisfaction
The test group	60	4.51±0.54
Control group	60	3.75±0.88

Notes .t=5.692,P=0.008

4.2. Discussion

4.2.1 Distinctive features of teaching and learning

① from the medium of teaching factors, according to the teaching program of post hip replacement nursing care to refine the characteristics of nursing skills, built on modern computer teaching tools, set up a simulator of the function of the project, the creation of scenarios simulation scenes, the purpose of the nursing students to immerse themselves in the implementation of patient-centered holistic nursing care, so that the nursing students from the passive implementation of the plan of care into an active plan of care implementer; ② From the teaching body factors, stimulate the interest of nursing students to learn orthopedic nursing. In China's undergraduate nursing education, schools and clinical teaching for various reasons for the relevant scientific research guidance is rare, access to information, analysis and processing aspects of the performance is poor. Through novel teaching methods and brainstorming discussions, not only can stimulate students' interest in learning, but also change the process from passive reception of information to active learning of knowledge. From the viewpoint of teaching effectiveness, teachers injected emotional factors into teaching, created simulation scenarios, improved teaching methods and teaching tools, as far as possible, to create an infectious, interested and good learning environment for the students, and

better guide the students, so as to make orthopedic internship teaching more effective, and produce good teaching results, and at the same time, improve the satisfaction of teaching.

4.2.2 Pedagogical issues

The Institute of Medicine has called for significant changes in healthcare education, requiring faculty and students to develop and exercise specific higher-order thinking skills, especially integrative skills. Currently, the majority of higher nursing education in China still utilizes a two-tiered learning structure with discipline-based nursing curricula, more basic medicine than nursing, and more theory than practice. The traditional hierarchical education can hardly support today's learners to gain a great future in such a world. Instead, a flexible, point-covered mesh structure can accommodate opportunities in a more expansive and generative manner. Currently, medical resources are scarce all over the world, and the aging population of China has seen its first peak in the 12th Five-Year Plan period, from 13.3% to 16%, which has led to a dramatic increase in geriatric healthcare, and as the proportion of the population expands, it is difficult to meet the needs of the existing medical resources. Hospitals are mainly responsible for the treatment of diseases. Nurses play a major role in preventive medicine as health managers, educators and counselors. Starting from every one of us, every detail, optimizing the environment, and raising people's health awareness, we can reduce the disease rate and thus reduce the medical burden. Strengthening our thinking on preventive medicine is the next step in the direction of improvement.

4.2.3 Responses to the development of teaching and learning

With the continuous development of my country's computer network technology in recent years and the advent of the Internet+ era, digital technology has become ubiquitous. Discussions, collaborations, comments and communication feedback are carried out through social media in life; in the field of teaching, virtual reality technology combined with traditional teaching is booming, allowing them to achieve good teaching purposes through the evolution of images, special effects sounds, and video synchronous or asynchronous teaching. CAI teaching has promoted the development of medical education and has become the focus of education reform in my country's teaching. It is also an inevitable trend in the development of medical education. The establishment of comprehensive development of comprehensive teaching requires the efforts of many aspects of society, such as policy support, multi-disciplinary cooperation, school cooperation, school-society cooperation and school-enterprise cooperation. Our hospital has introduced a systematic "school cooperation" clinical teaching model in undergraduate nursing students' internships, which can improve satisfaction and provide a reference for the reform of clinical nursing teaching and improvement of nursing teaching quality. Strengthening the cultivation and training of comprehensive abilities may be a breakthrough in solving problems.

5. Conclusion

Based on the actual situation, our department refines the characteristics of orthopedic specialty, integrates teaching resources, uses computer-assisted teaching and creates

situational simulation teaching in combination with its own conditions, and creates a knowledge network structure with "hip replacement" as the center point, which covers medical, nursing, rehabilitation, humanities, testing, community, science and technology, etc., so as to help students build up a net-like comprehensive thinking ability. Help students to build up the ability of comprehensive thinking in a net. Students not only learn knowledge and feel the learning method, but also have rational analysis of the problem, and truly understand the meaning and joy of lifelong learning. The integrated teaching effectively solves the teaching contradiction of insufficient opportunities for clinical practice, and has a good effect on improving students' autonomy in learning, comprehensive ability, and satisfaction with the teaching, providing a guiding direction for further optimizing the teaching methods, and at the same time, providing a basis for the reform of nursing internship teaching in our hospital.

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