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# *Research on the Path to Improve the Effect of Practical Training in Sports Rehabilitation Major*

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***Abstract:*** This study aims to construct a practical training teaching mode oriented by the professional qualification certification standards and the competency requirements of national skill competitions, and to explore its effect on the enhancement of the quality of talent cultivation of sports rehabilitation majors. Specific research adopts stratified random sampling method to select students majoring in sports rehabilitation as experimental group and control group, the experimental group implements the modular teaching design integrating the key points of the national vocational qualification assessment and the scoring system of the National Rehabilitation Skills Competition, focuses on constructing a three-dimensional teaching strategy of "clinical scenario simulation-standardized case analysis-complex skills training", and establishes a two-track assessment system including process evaluation and summative evaluation. The assessment system includes process evaluation and summative evaluation. The results showed that the experimental group improved significantly in core skills such as sports injury assessment and rehabilitation program development ($p<0.001$), and there was a significant difference between the theoretical assessment scores ($p=0.021$). The student teaching satisfaction survey showed high overall ratings. The study demonstrated that the practical training model constructed based on industry standards and competition competency matrix can effectively promote the development of professional core literacy and provide an innovative path for the clinical competency development of sports rehabilitation students.

## 1. Introduction

With the popularization of national fitness in recent years, it has gradually become a trend for the public to pay attention to scientific exercise. Sports rehabilitation services are transforming from a niche demand for professional athletes and sports enthusiasts to providing health services for patients with chronic diseases and the elderly. With the increasing demand, sports rehabilitation will play an important role in the construction of public health. Under the background of the integration of sports and medicine and healthy China, higher requirements have been put forward for the cultivation of composite rehabilitation talents, and the cultivation of talents specialized in sports rehabilitation

should develop practical courses such as vocational skills and professional skills from the perspective of job requirements and competence-based. This study based on the constructivist learning theory and the concept of Outcome-Based Education, the study focuses on solving the outstanding problems of the traditional practical training teaching, such as the disconnection between skill cultivation and industry demand, and the single dimension of practical evaluation, by integrating the industry certification standards and the evaluation system of the competition. This project aims to cultivate sports rehabilitation professionals with high professional abilities and professional qualities, and will strive to achieve the integration of teaching content and job requirements.

## 2. Research subjects and methods

### 2.1. Research subjects

Undergraduate students majoring in Exercise Rehabilitation who are sophomores and juniors in an institution of higher education and have taken the core major courses. The study subjects were randomly divided into experimental (n=44) and control groups (n=35).

### 2.2. Research methods

The experimental group implements the modular teaching design integrating the key points of the national vocational qualification assessment and the scoring system of the National Rehabilitation Skills Competition, focuses on constructing a three-dimensional teaching strategy of “clinical scenario simulation-standardized case analysis-complex skills training”, In this study the clinical practice ability of undergraduate students majoring in sports rehabilitation is mainly explored through both the practical teaching session of the professional core courses and the internship session. Through the design of practical training and internship content that is more in line with the students' work content, it aims to improve the students' competitiveness in employment.

#### 2.2.1. Practical Training Session

The content of the practical training teaching session in order to be more compatible with the skills required for clinical work, mainly combines with the syllabus of the qualification examination for rehabilitation medicine therapeutic technician and the assessment content of the relevant professional skills competition of the national colleges and universities, and improves the content of the practical teaching and the assessment method. The effect is evaluated through students' theoretical scores, practical scores, total evaluation scores and satisfaction. Rehabilitation therapist qualification examination syllabus is divided into four parts, basic knowledge, related professional knowledge, professional knowledge, professional practice ability. The enhancement of practical training teaching mainly centers on the parts of professional knowledge and professional practice ability syllabus. The syllabus of the practice qualification examination has consistency with the syllabus of the core classes in the part of sports rehabilitation. The content of the foundation of rehabilitation assessment in professional knowledge is applied to the course of Rehabilitation Functional Assessment, including the general theory of rehabilitation assessment, muscle strength assessment, muscle tension assessment, joint mobility assessment, sensory function assessment, balance and coordination function assessment, gait analysis, cardiorespiratory function assessment, and daily life activities assessment, etc. The basic aspects of rehabilitation therapy include: physical factor therapy, joint mobility training, joint loosening, muscle strength training and muscular endurance training, and muscle strength training and muscular endurance training. The basic aspects of rehabilitation therapy include: physical factor therapy, joint activity training, joint loosening technique, muscle strength

training and muscle endurance training, detraction training, aerobic training, respiratory training, balance and coordination training, and related treatment techniques for patients with central nervous system injuries and other related points.

The content of the professional competition is based on the curriculum system and professional requirements of the sports rehabilitation specialty, using a combination of written theoretical examination and skills operation. The written theoretical examination covers sports anatomy, exercise physiology, rehabilitation assessment, sports injuries, musculoskeletal rehabilitation, rehabilitation of chronic diseases and sports prescription, and the relevant sports rehabilitation technology and other courses; the skills operation competition includes sports protection skills such as cardio-resuscitation and taping, muscle training, and muscle training. The skills operation competition includes sports protection skills such as cardiopulmonary resuscitation and taping, musculoskeletal rehabilitation, and exercise prescription for chronic diseases, which can help to enhance the social adaptability, professional competitiveness, teamwork, innovation, and ability of the participating students, and improve the students' entrepreneurial practice literacy, competition literacy, and professional practice ability, so as to achieve the effect of comprehensive parenting.

### 2.2.2. Internship Session

The internship units mainly include general tertiary hospitals, sports management companies and provincial sports management centers. Students complete a 30-week internship. The internship includes participation in the functional assessment of rehabilitation. Students learn to use a variety of rehabilitation assessment tools, including scales and unaided assessment, to conduct a comprehensive assessment of the patient's rehabilitation needs and current status. Based on assessment results, interns learn to develop individualized rehabilitation plans to meet specific patient needs. Interns participate in the design and implementation of rehabilitation exercises. Based on the patient's rehabilitation needs, combined with the knowledge and theory of rehabilitation medicine, the intern implements the training program designated by the rehabilitation physician, and completes the program of physical training, exercise training, and functional training under the guidance and supervision of the lead instructor. During this process, interns will learn to utilize a variety of rehabilitation techniques and tools to promote the functional recovery of patients. Learn to provide rehabilitation instruction and education to patients and their families. This includes explaining the importance, methods, and expected outcomes of rehabilitation, guiding patients to actively participate in rehabilitation, and answering their questions and concerns about the rehabilitation process. Interns learn how to establish good communication with patients and families to improve outcomes and patient satisfaction. Interns participate in the teaching component of the department. This includes teaching visits, case discussions, departmental mini-lectures or symposia, participation in simulation training, and participation in the department's daily activities such as learning, assessment, and case discussions. Some interns will also collect and analyze professionally relevant data from the rehabilitation clinic to assess the effectiveness and quality of rehabilitation treatment. During the internship, students will also be able to learn about and use various advanced equipment and techniques used in the Rehabilitation Department of a tertiary hospital, including suspension systems, isokinetic muscle strength testers, balance trainers, etc. Through these practical activities, interns will be able to gain a more comprehensive understanding of the workflow and clinical practice of the Rehabilitation Department, and to improve their own professionalism and practical skills.

## 3. Results

### 3.1. Evaluation of student satisfaction with the internship training process

Questionnaires were distributed to the experimental group and 21 valid questionnaires were recovered. The questionnaire consisted of 15 questions, and each objective question was divided into 4 levels: very compliant, quite compliant, not very compliant, and very non-compliant, and the average satisfaction score of the questionnaire was 3.78/4 points. Overall, the students' satisfaction index with the practical training and internship teaching activities of the program is high, as shown in Table 1.

Table 1: Satisfaction evaluation of practical training and internship sessions.

| Question | Satisfied | Quiet satisfied | General | Dissatisfied | Question score/total score |
|---|---|---|---|---|---|
| Satisfaction with Practical Teaching Sessions in Core Courses | 14 | 4 | 3 | 0 | 3.57/3.78 |
| Satisfaction with Practical Teaching in Your Internship Unit | 16 | 5 | 0 | 0 | 3.78/3.78 |

Through the process of practical training and teaching and internship, students are able to obtain professional competence enhancement as shown in Table 2. In the questionnaire survey, there are mainly three questions centered on this aspect, and the data show that the students' recognition of the practical training and internship sessions is also at a high level.

Table 2: Satisfaction evaluation of practical training and internship sessions.

| Question | Strongly agree | Agree | Disagree | Strongly disagree | Question score/total score |
|---|---|---|---|---|---|
| Through the internship, you can master the necessary practical skills and improve their comprehensive quality. | 15 | 6 | 0 | 0 | 3.74/3.78 |
| Teachers in the internship unit carefully guide you in practical operation and help solve the difficulties encountered in the operation. | 17 | 4 | 0 | 0 | 3.83/3.78 |
| The practical teaching sessions of your specialized core courses can improve your direct clinical practice ability. | 16 | 4 | 1 | 0 | 3.70/3.78 |

The results of the questionnaire showed that the students thought that the practical teaching content of the professional program was closely related to the clinical skills required for the profession. Students also commented positively on other aspects, including the professionalism, supervisory ability, and diversity of practicum teaching methods of the instructors in the practicum unit.

### 3.2. Analysis of students' performance in specialized courses

The exploration of the enhancement of practical training teaching methods is mainly carried out in the core course of sports rehabilitation. The total final evaluation grade of the course consists of three parts, including 30% of class performance, 30% of practical assessment grade, and 40% of final examination grade. The class performance is the result of the comprehensive assessment of students' attendance and class participation. The control group and the experimental group of sports rehabilitation professional practice assessment in the same way, are random to the examination question mark note serial number, students draw the serial number immediately after the start of the

examination operation of the demonstration, practical operation assessment of the grading standard remains consistent. The final examination is completed by a closed-book unified college examination, including subjective and objective questions. An overall grade of greater than 90 is considered excellent. Students' professional core course assessment results are shown in Table 3. The statistical results show that students have a very significant increase in their practical assessment scores and a significant increase in their final assessment scores under the same grading criteria. The overall excellence rate has also increased. It indicates that the students have improved their ability in practical and final theoretical assessment accordingly.

Table 3: Comparison of performance on specialized core course ($\bar{x}\pm s$).

| Group | n | Practical examination | Final examination | Overall grade | Outstanding rate |
|---|---|---|---|---|---|
| Control group | 35 | 75.71±12.84 | 82.46±6.88 | 82.43±6.63 | 14.29% |
| Experimental group | 44 | 86.7±9.27** | 78.52±6.97* | 84.75±5.47 | 20.45% |
| *P* | | <0.001 | 0.021 | 0.101 | |

*Represents a significant difference between groups, $p<0.05$, ** represents a highly significant difference between groups, $p<0.01$.

## 4. Discussion

Three Year Action Plan for Improving National Health Literacy in 2024 aims to improve the health literacy of the entire population, enhance people's health awareness, improve the universal health service system, strengthen preventive health care, prevent and control major diseases, promote the high-quality development of the health industry, and satisfy the diverse health needs of the people. The National Health Commission 2024 has issued four guidelines on food and nutrition[1], which encourages residents to rationally combine their daily meals. With the introduction of numerous policies, the popularization of mass sports and the hot fitness market, sports injuries, dietary guidance, injury and chronic disease prevention have gradually been emphasized, and the market demand for sports rehabilitation professionals is increasing.

The study showed that contextualized practical training teaching design can enhance students' clinical operation ability, a result that confirms the effectiveness of constructivist learning theory[2]in rehabilitation professional education, which promotes knowledge transfer and skill internalization by simulating real clinical scenarios, using standardized patients in learning, and introducing real cases. Further analysis revealed that the main reason for students' difficulties in bridging theory and practice may lie in the lack of association between the knowledge modules of the core professional courses, such as the fragmentation of the teaching and assessment of rehabilitation assessment techniques and sports rehabilitation techniques, which leads to the lack of students' clinical reasoning ability. It is suggested to introduce the Spiral Curriculum, embedding the same case clusters in the core courses such as Sports Rehabilitation Technology and Rehabilitation Functional Assessment in a hierarchical progression to strengthen the knowledge correlation. Currently, the internship units of professional students are mainly hospitals with a single structure, which is difficult to meet the practical needs of diversified injury scenarios, such as the treatment of various acute sports injuries and sports intervention for patients with chronic diseases. Students' demand for diversification of internship units reflects that rehabilitation education needs to buttress the demand for talents in the three-level rehabilitation network: including medical institutions (acute rehabilitation), community rehabilitation (functional training in the recovery period), and sports and health institutions (training in the return to sports). It is necessary to establish a dynamic evaluation mechanism for internship bases, and use the “clinical competency matrix”, which covering the three major fields of neurological,

musculoskeletal, and cardiopulmonary rehabilitation, as the basis for selecting professional internship cooperation units, so as to ensure that the types of illnesses encountered by students cover the full dimensions of the International Classification of Functioning. The model of integration of health and fitness requires that rehabilitators have the ability to design exercise prescriptions, manage chronic diseases and provide nutritional guidance. In response to this demand, the curriculum reform needs to focus on opening community rehabilitation-related social practice activities[3], integrating dietary guidance, group exercise supervision techniques, etc., combining clinical medicine, nutrition and psychology majors to carry out community chronic disease joint care practical training, and training students to formulate personalized intervention plans. The assessment requirements of the rehabilitation therapist qualification examination for traditional Chinese treatments such as the Baduanjin and the Five Animal Exeicises reveal the necessity of Cultural Competence in rehabilitation education. Studies have shown that the first four postures of Baduanjin can increase the active mobility of the hand, wrist, elbow, and shoulder joints on the affected side, and that it has obvious advantages for breast cancer patients to improve the function and quality of life of the upper limbs after surgery[4] . In view of the obvious efficacy of Chinese traditional health maintenance exercises in a variety of chronic diseases[5], it is recommended that a modular traditional exercises course be developed for rehabilitation students, and that additional units related to it be added to courses such as musculoskeletal anatomy and exercise therapy, accompanied by a virtual simulation case library.

## 5. Conclusions

By building a multi-dimensional coupled training teaching model of “industry standard - competition ability - clinical practice”, this study demonstrates that the curriculum reform based on the professional qualification certification and the national professional skill competition evaluation system can significantly improve the clinical adaptability of the training of sports rehabilitation talents. The students in the experimental group showed significant improvement in the core professional qualities such as clinical thinking ability and practical ability, and the standardization of their skill operation was improved compared with the traditional teaching mode. This teaching mode innovatively transforms the practice qualification standard and the ability of disciplinary competitions into teaching and learning, and provides data support for the dynamic adjustment of the OBE curriculum system of the sports rehabilitation specialty.

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