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Empirical Research on the Integration of Medical and Educational Models in Cultivating Professional Abilities in Traditional Chinese Medicine Rehabilitation Techniques

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Abstract: This study empirically analyzes the application effect of the integration of medical and educational models in cultivating professional abilities in traditional Chinese medicine rehabilitation techniques. The research subjects are 100 students from the Traditional Chinese Medicine Rehabilitation Technology major at Y school. Through questionnaire scores, practical training results, and interview data, this study explores the outcomes of this integrated approach. The findings reveal that students in the experimental group significantly outperform those in the control group in terms of practical operation skills, professional responsibility, and communication and collaboration skills. This research confirms the notable role of the medical-educational integration model in enhancing the professional skills and accomplishments of students majoring in traditional Chinese medicine rehabilitation, providing a scientific basis for vocational education reform and the cultivation of rehabilitation technical talents.

Keywords: Medical-educational integration model; Professional ability; Education reform

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1. Introduction

The Traditional Chinese Medicine (TCM) Rehabilitation Technology major is a crucial component of medical-vocational education, aiming to cultivate skilled talents with both theoretical knowledge and practical skills. However, the traditional teaching model, primarily focused on classroom instruction, often lacks adequate practical components, leading to a mismatch between students' skill levels and industry demands. As the medical industry's demand for TCM rehabilitation professionals grows, the cultivation of professional abilities becomes increasingly important [1]. To address this issue, the integration of medical and educational models, which deeply combines education with medical practice, offers a new direction for the reform of

TCM rehabilitation education [2]. This study aims to systematically analyze the practical effectiveness of the medical-educational integration model through empirical research, explore its application pathways in TCM rehabilitation teaching, provide a scientific basis for higher vocational education reform, and deliver high-quality rehabilitation technical talents to the medical industry.

2. Literature review

2.1. Concept and development of the medical-educational integration model

The medical-educational integration model is one of the core directions of medical education reform. This model emphasizes effective linkage between classroom teaching and real medical scenarios, aiming to enhance students' practical skills and job adaptability [3]. In recent years, the medical-educational integration model has been widely applied in nursing, midwifery, and other majors. For instance, the integrated education model of "post, course, competition, and certificate" and case-based teaching practices have significantly improved students' comprehensive qualities [4,5]. In vocational education, this model utilizes school-enterprise cooperation, resource sharing, and situational teaching methods, enabling students to participate in clinical practice while learning theoretical knowledge. This approach helps bridge the gap between education and industry needs [6]. Although this model has achieved successful applications in multiple professional fields, research and practice in the TCM Rehabilitation Technology major remain limited, with scarce relevant literature, providing further exploration space for this study.

2.2. Current status and issues of TCM rehabilitation education

As a vital component of vocational education, the TCM Rehabilitation Technology major aims to cultivate skilled talents with a solid foundation in TCM theory and practical rehabilitation skills [7]. However, the current TCM rehabilitation education faces several challenges. Firstly, there is a disconnection between theory and practice in course settings. Students often learn through simulated exercises, lacking training in real clinical scenarios, which results in inadequate adaptability when facing actual work situations [8]. Secondly, existing teaching designs tend to focus on imparting basic knowledge while overlooking the comprehensive cultivation of professional abilities. This is particularly evident in the inadequate training of critical vocational skills such as patient communication, rehabilitation plan design, and implementation.

3. Research design and methods

3.1. Research subjects and scope

This study focused on students majoring in TCM Rehabilitation Technology at Y school. A total of 100 students were selected to participate in the study, including 80 second-year students and 20 third-year students. They were randomly divided into an experimental group and a control group, with 50 students in each group, based on factors such as gender, age, and basic abilities. Additionally, the project involved 11 teachers with rich teaching experience and clinical backgrounds to participate in teaching design and guidance.

3.2. Teaching design

3.2.1. Experimental group

Students in the experimental group were taught using the integrated medical-education model. Specific teaching contents and formats included hospital training, where students participated in patient rehabilitation under the

joint guidance of professional doctors and teachers at Jiaozuo Traditional Chinese Medicine Hospital; situational simulation teaching, where students designed rehabilitation plans and completed practical operations in the classroom [9]; and case-based teaching, which involved selecting real patient cases, analyzing the condition, and discussing rehabilitation plans to help students closely integrate theoretical knowledge with practical operations [10].

3.2.2. Control group

Students in the control group were taught using the traditional classroom teaching model, which mainly focused on theoretical courses. Practical courses primarily involved basic skill operations on campus and did not involve hospital training or situational simulation.

3.3. Data collection and analysis

To comprehensively evaluate the effectiveness of the integrated medical-education model on improving students' professional abilities, this study used a Likert 5-point rating scale for the questionnaire, covering multiple dimensions such as practical operation ability, communication and collaboration ability, and professional quality. The score range was from 1 (very inadequate) to 5 (very excellent).

3.3.1. Training performance records

Based on students' actual performance during hospital training and on-campus practice, scores were assigned by instructors and industry mentors, with a maximum score of 100. The scoring criteria included skill standardization, operational safety, patient communication, sense of responsibility, emergency response, and professional identity.

3.3.2. Interview records

Semi-structured interviews were conducted with students from both the experimental and control groups to collect feedback on teaching models and learning experiences. Key conclusions were extracted through thematic analysis.

3.3.3. Data analysis

Methods such as *t*-tests, variance analysis, and correlation analysis were used to compare the questionnaire scores, training performance, and the degree of correlation between professional ability improvement and specific aspects of the teaching models between the experimental and control groups.

4. Results

4.1. Initial results analysis

4.1.1. Questionnaire scores

The mean score for professional ability in the experimental group was 4.5 ± 0.3, which was higher than 3.8 ± 0.4 in the control group, indicating a statistically significant difference ($t = 7.34$, $P < 0.01$).

4.1.2. Training performance

The average training score in the experimental group was 88.5 ± 5.6, significantly higher than the 75.4 ± 6.2 in the control group ($t = 8.21$, $P < 0.01$).

4.1.3. Interview feedback

Students in the experimental group generally believed that the integrated medical-education model helped improve their confidence in practical operations and communication skills with patients. Feedback from the control group focused more on the accumulation of theoretical knowledge, with students feeling unfamiliar and unadapted to clinical scenarios.

4.2. Effectiveness of professional ability improvement

4.2.1. Skill scores

The average skill score for students in the experimental group was 88.5 ± 5.6, which was higher than 73.8 ± 6.4 in the control group, representing an increase of approximately 20% in the experimental group ($t = 9.15$, $P < 0.01$).

4.2.2. Professional responsibility

In terms of professional responsibility, the average score in the experimental group was 4.7 ± 0.4, which was 15% higher than the 4.1 ± 0.5 in the control group ($t = 6.23$, $P < 0.01$).

4.2.3. Communication skills

Students in the experimental group excelled in communication with patients and the team, with an average score of 4.5 ± 0.3 compared to 3.9 ± 0.4 in the control group, representing an improvement of approximately 15% ($t = 7.08$, $P < 0.01$).

4.2.4. Analysis

Repeated practice in real clinical scenarios significantly enhanced the operational skills and proficiency of students in the experimental group. Case-based teaching and situational simulation facilitated the cultivation of students' professional responsibility and improved their communication skills, enabling them to face actual job requirements more confidently.

4.3. Satisfaction and feedback

Analysis of questionnaire data revealed that the overall satisfaction rate of students in the experimental group with the integrated medical-education teaching model reached 90%. Feedback focused on the improvement of practical skills, recognition of teaching methods, and increased interest in learning. However, the satisfaction rate of students in the control group was only around 65%, mainly reflecting issues such as inadequate practical opportunities and the lack of real-scene training.

4.4. Evaluation from teachers and training bases

Teachers involved in teaching and managers of training bases unanimously recognized the significant role of the integrated medical-education model in enhancing students' abilities, particularly in terms of skill proficiency, operational standardization, and professional quality. Teachers pointed out that students in the experimental group could propose effective rehabilitation plans based on actual cases during rehabilitation treatment. Meanwhile, training base managers emphasized that students in the experimental group demonstrated a stronger sense of responsibility and team collaboration abilities during training, which were significantly better than those in the control group.

5. Discussion and suggestions

5.1. Discussion

Through hospital training and situational simulation, students' skills in manual therapy and exercise rehabilitation guidance have significantly improved, enabling them to more proficiently meet the demands of clinical scenarios. Furthermore, case-based teaching and team collaboration training have effectively enhanced students' professional responsibility and interpersonal communication skills, leading to notable progress in their professional qualities.

The integrated medical-education model closely aligns teaching content with actual job requirements, accelerating students' transition from theory to practice through repeated operations in real-world settings. Diversified teaching formats, such as case-based teaching and simulation training, have stimulated students' interest and initiative in learning, helping them master key skills.

Although the integrated medical-education model has excelled in enhancing professional abilities, there are still some shortcomings in its implementation. These mainly center around the uneven distribution of teaching resources and poor adaptation of some students to clinical teaching. Improvement directions should include increasing the number of training bases, optimizing scheduling mechanisms, and providing psychological counseling or adaptability training for students with poor adaptation.

5.2. Suggestions

5.2.1. Deepening the collaboration mechanism between schools and hospitals

First, establishing a long-term cooperation framework. Schools and hospitals should sign strategic cooperation agreements and jointly develop teaching plans to ensure stable training opportunities for students. Second, enriching practical aspects. Exploring an integrated mechanism of "1+2" and "internship-practicum-pre-job training" to increase students' exposure to actual cases and enhance their job adaptability. Third, sharing resource platforms. Utilizing digital technology to establish remote teaching platforms, enabling remote sharing of hospital cases, training equipment, and other resources to alleviate the issue of inadequate teaching resources.

5.2.2. Strengthening the construction of dual-qualified teacher teams

Clinical training for teachers is conducted. Regularly arranging clinical practice for teachers in hospitals can update their clinical knowledge and skills for better student guidance. Plus, diversified teacher training is ensured. Enhancing teachers' teaching abilities through professional competitions, case analysis training, and other methods to promote innovation in their teaching methods. Talent incentive mechanisms are realized. Providing more career development opportunities and incentive policies for teachers involved in the integrated medical-education model can increase their teaching enthusiasm.

5.2.3. Improving the curriculum system

First, optimizing course structure. Incorporating modern rehabilitation technology courses into the existing curriculum system, combining them with TCM rehabilitation methods to form a traditional and modern integrated course design. Next, strengthening practical teaching. Increasing the proportion of practical training in courses, such as regularly conducting group-based situational simulations or case discussions. Third, assessment and feedback mechanisms. Establishing a dynamic assessment system to timely adjust course content and teaching methods based on student feedback and training base evaluations.

6. Conclusion

This empirical analysis demonstrated that the integrated medical-education model significantly enhances the professional abilities of students majoring in TCM Rehabilitation Technology. Students showed notable improvements in practical skills, professional responsibility, and communication abilities. The diversified teaching formats of the integrated medical-education model effectively address the weaknesses of the traditional teaching model, which often lacks sufficient practical components. Feedback from participating teachers and training bases further validates the model's significant advantages in cultivating high-quality TCM rehabilitation professionals, providing valuable experience for the further development of modern vocational education.

The limitations of this study primarily lie in the sample coverage and duration of the practical component. The study focused only on students majoring in TCM Rehabilitation Technology at Y school, and the small sample size makes it difficult to fully reflect the actual situations in different regions and institutions. Therefore, the universality of the conclusions needs further verification. Future research can expand the sample scope by selecting students from more regions and levels of institutions to explore the specific impact of the integrated medical-education model on students' employment quality, career development, and job competency. This will further validate the educational value of this model.

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Disclosure statement

The authors declare no conflict of interest.

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