

Research on Virtual Simulation Experiment Teaching System of Integrated Medicine Based on IPE Concept

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ABSTRACT

At present, most medical colleges and universities in China follow the traditional curriculum-centered teaching mode. This kind of education mode cuts off the connection between disciplines, and is not conducive to the cultivation of students' overall medical concept, as well as the cultivation of compound medical talents, which is the strategic demand of healthy China. Therefore, the integrated medical curriculum training system based on the concept of IPE (Interprofessional Education) has become the main direction of current medical teaching reform. The main purpose of this paper is to study, within the framework of the existing education, research and integration of clinical medicine, preventive medicine, nursing, medical imaging, medical inspection technology, anesthesiology, rehabilitation therapeutics, applied psychology, and so on many specialized knowledge, using the integrated medical thinking, build integrated medicine integrated platform, thus forming IPE education the new idea of teaching strategies. Therefore, the focus of this study is to integrate and build an integrated virtual simulation platform of integrated medicine, and to provide an important practical basis and practicality for carrying out IPE education.

Keywords: Integrative medicine, Organ system, Interspecialty education, Multidisciplinary education component

1. INTRODUCTION

In recent years, with the rapid development of China's economy and society, people's living environment and lifestyle have undergone great changes. Health problems are becoming increasingly prominent, with chronic diseases, senile diseases, obesity and sub-health tending to increase. To solve these problems, it is urgent to establish the concept of big health. The so-called great health refers to the whole-process, comprehensive and total factor care of life, which pursues not only individual physical and physical health, but also psychological, spiritual, social, environmental, family and crowd health. However, most medical colleges and universities in China are using the traditional subject-centered curriculum teaching mode. This kind of education mode cuts off the connection between disciplines, and is not conducive to the cultivation of students' overall medical concept, as well as the cultivation of compound medical talents, which is the strategic demand of healthy China. Therefore, the

integrated medical curriculum training system based on the concept of IPE (Interprofessional Education) has become the main direction of current medical teaching reform [1].

2. THE NECESSITY OF CONSTRUCTING AN INTEGRATED MEDICAL CURRICULUM SYSTEM CENTERED ON ORGAN SYSTEM IN TODAY'S MEDICAL EDUCATION

As mentioned above, most medical colleges and universities in China follow the traditional subject-centered curriculum teaching mode. The advantages of this model reflect the system and integrity of medical science, convenient teaching implementation and management; However, it is not conducive to students' systematic mastery of medical knowledge and the establishment of an overall medical concept. In addition, there are inevitably overlapping and repetitive problems in the teaching contents of various subjects.

Faced with these problems, some medical colleges and universities at home and abroad have carried out the integration mode of medical curriculum centering on organ system. According to the principle of "from macro to micro, from form to function, from normal to abnormal", Systematic anatomy, histology and embryology, physiology, medical immunology, pathology, pathophysiology and pharmacology of basic medicine were organically integrated into one general course and 10 systematic module courses. The courses of clinical medicine including internal medicine, surgery, obstetrics and gynecology and pediatrics were integrated into one general course and 10 disease modules. Construct the curriculum model of "organ system as the center". At present, many medical colleges and universities in China have taken the initiative to adapt to the new development of contemporary medicine and the new demand of health services, closely connected with the new concept of medicine, integrated the teaching of basic medicine and clinical medicine, carried out the pilot teaching reform of "organ system as the center" curriculum mode, and cultivated the core competence of medical students. The pilot work tries to form a quality-oriented education model centering on cultivating students' innovative ability and practical ability by carrying out the teaching reform of comprehensive medical curriculum mode centering on organ system.

However, with the progress and development of medical concept, the concept of purely based on clinical medicine has changed. At present, the modern medicine is dominated by "disease" as to "health" as the leading factor, the overall level of the social demand for medical and health services improve, diversified trend of increase, therefore, objectively requires accomplishes a number as soon as possible size appropriate, good quality, reasonable structure distribution of comprehensive medical personnel, to promote the effective implementation of the strategy of "healthy China". Therefore, on the basis of the "organ system as the center" curriculum system, it is necessary to construct the new concept of modern medicine and cultivate comprehensive medical quality talents.

3. THE URGENCY OF CONSTRUCTING IPE (CROSS-SPECIALTY EDUCATION) INTEGRATED MEDICAL TEACHING PLATFORM UNDER THE GENERAL POLICY OF HEALTHY CHINA KEEP

Under the background of integrated medicine, the excessive fine division of specialized medicine is not the ultimate direction of medical development. Many scholars believe that the division of modern medicine is becoming more and more fine, knowledge is becoming more and more fragmented. Only grasp a point to cure the whole body is not good, this is the contemporary medicine must pay attention to the "pain point" problem. Therefore, modern medicine needs to synthesize the existing knowledge and integrate the existing experience, and inject this new idea into the stage of modern medical education becomes particularly important. Traditional medical education or current centered on organ system of the integration of medical education are difficult to get rid of the specialization of medical education purpose, resulting in medical division of labor is more and more sophisticated, more professional, serious lack of communication between the various professional contact, very easy to appear because of the thoughtless and affect the quality of medical treatment, serious cause medical accidents. How to improve the mutual understanding, understanding, cooperation and exchange among various specialties through medical education, in order to improve the quality of medical treatment, this has become a practical problem to be solved urgently.

The World Health Organization (WHO) issued a statement in the 1980s, suggesting that medical students can learn and cooperate with each other between their specialties, which is conducive to better play the advantages of multi-specialty cooperation in the future work practice. In recent years, IPE has been widely accepted and recognized in the field of medical education. For example, the conference on Cross-specialty Teaching Strategies held in the United States in 2011 attracted 750 members from more than 70 countries and carried out heated discussions on IPE preparation, development strategies, sub-institutions, and adjacent layer structure, marking the arrival of new strategies for IPE education in the new century. In a word, IPE education strategy is a new educational method for multiple majors to respect and learn,

enhance mutual trust, and improve the quality of medical education. It is a teaching method of global concern and has a specific application prospect and significance [2]. In 2019, the Ministry of Education promptly proposed to vigorously develop "new medical sciences" to adapt to the new round of scientific and technological revolution and industrial transformation, and at the same time implemented the "Six Excellent and One Top" plan 2.0, aiming to cultivate excellent medical talents who can use interdisciplinary knowledge to solve complex problems in the medical field. Therefore, the comprehensive and cross-disciplinary talent training mode is in line with and conducive to the effective implementation of the "Healthy China" strategy. Therefore, the cultivation of contemporary medical talents must carry out interdisciplinary integration, and the implementation of IPE education mode reform is imperative [3].

At present, the establishment of IPE medical personnel training system is still in the exploratory stage. Therefore, within the existing educational framework, research and integration of multidisciplinary professional knowledge, the use of integrated medicine thinking, break through the barrier of cross-specialty integration, and build integrated medical information virtualization and integration platform; The development of IPE virtual experiment project based on nine major systems is an important way to improve students' comprehensive application ability of cross-professional knowledge [1].

4. EDUCATIONAL FRAMEWORK OF VIRTUAL SIMULATION EXPERIMENT PLATFORM BASED ON IPE

In the current stage, it is difficult to abandon the single professional education and completely carry out IPE medical education of "holistic medical concept, holistic medical education, cross-professional responsibility and contribution". The medical virtual simulation experiment platform can integrate medical resources of various specialties, with remarkable teaching effects and large benefits. With the help of this platform, students have a strong interest in experiments, their independent learning ability can be significantly enhanced, and their practical innovation ability can be significantly improved. Through the development of online teaching services, it can actively play a leading role in the demonstration of experimental teaching

information construction in various majors. Therefore, under the background of the impact of mobile Internet technology and the cultivation of all-round talents, the establishment of virtual simulation projects in line with the characteristics of IPE and the cultivation of composite and practical innovative and entrepreneurial talents have become an important way to effectively achieve IPE under the current situation of single professional medical education. At present, we have designed and developed the platform of "Virtual simulation Experiment of Integrated medicine of organ System based on the concept of" big Health "-- Motion System. Through this platform, medical students of various majors are encouraged to take disease as the core and contribute their own efforts for the common interests of patients. Through this platform, the responsibilities of each profession are clear, the limitations of each profession are clear, and the most appropriate overall plan is selected as far as possible to provide the most correct intervention; Through this platform to seek for health for the purpose of patient rehabilitation first solidarity and cooperation. The development and construction of this platform will try to guide medical students to acquire knowledge and information from multi-specialty cooperative groups, and cultivate professional communication and cooperation, which provides favorable support for this study.

5. RESEARCH SCHEME OF VIRTUAL SIMULATION EXPERIMENT PLATFORM BASED ON IPE

This study "organ systematic virtual simulation experiment system based on the clinical case" as a platform, development for the eight medical professional (clinical medicine, preventive medicine, nursing, medical imaging, medical inspection technology, anesthesiology, rehabilitation medicine, applied psychology), through case IPE cross major cooperation study, clinical diagnosis and treatment of teaching model research. The main research contents include experimental teaching system teaching platform, student training and teaching team.

5.1. Research on virtual simulation experimental teaching platform of organ system integration medicine based on IPE concept

To construct and develop virtual simulation learning software of organ system integrated medicine based on the concept of IPE: to develop virtual simulation experiment project of organ system integrated medicine according to the design of nine major systems, cardiovascular system and motor system have been developed; Integrating the nine organ system software of medical virtual simulation experiment, relying on the national virtual simulation experiment teaching center, constructing the virtual simulation learning platform of organ system integration and integration of medicine based on IPE big health concept.

5.2. Research on teaching team based on IPE concept experiment system

The research group has formed a teaching staff with rich experience in front-line teaching and curriculum management, active participation in teaching reform, strong teaching ability, use of new technology to improve the efficiency of teaching and teaching management, and reasonable staff structure and task division.

5.3. Research on student cultivation based on IPE concept experiment system

By using Interdisciplinary Education Perception Scale (IEPS) [4], the optimum object for IPE study, such as major and grade, is demonstrated; The foundation of THE CONCEPT of IPE is that students of all majors can reach a common cooperative goal in terms of interests by participating in it. It is an important content of student training to study and construct the training goal of experimental teaching cooperation in line with the concept of IPE [5].

6. CONCLUSIONS

The basic idea of this study is to upgrade, construct, practice and deeply study the virtual simulation experiment system based on IPE concept and clinical cases based on the existing national virtual simulation experiment teaching platform. We try to build the integrated virtual teaching mode of "online independent learning, offline discussion and communication", so as

to broaden students' professional horizon and broaden their professional caliber, so as to cultivate students' cooperative ability and enhance their comprehensive knowledge category and skills.

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REFERENCES

- [1] Virtual Interprofessional Education (VIPE): a Multi-institutional Innovation. Showstark M, Joosten-Hagye D, Wiss AC. *Med Sci Educ*. 2021 Nov 24;1-2.G.
- [2] A behavioural study of obedience in health professional students. Violato E, Witschen B, Violato E, King S. *Adv Health Sci Educ Theory Pract*. 2021 Nov 22.
- [3] Systems thinking: advancing health advocacy training; a perspective from junior family physicians in the Middle East. Alameddine R, Taleb R, Al-Habbal K, Patel KD. *Educ Prim Care*. 2020 Mar; 31(2):71-73.
- [4] Effectiveness of an Interprofessional Education Model to Influence Students' Perceptions on

Interdisciplinary Work. Swinnen E, Fobelets M, Adriaenssens N, Vandyck E, Goelen G, Moortgat E, Laforge D, Peersman W.J Nurs Educ. 2021 Sep; 60(9):494-499.

- [5] How pharmacy and medicine students experience the power differential between professions: "Even if the pharmacist knows better, the doctor's decision goes" PLoS One. 2021 Aug 26; 16(8): e0256776.