



Holistic Integrative Pharmacy and its application in educational practice

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[Abstract] Holistic integrative pharmacy is an inevitable trend in the development of in modern pharmacy. This paper attempts to expound the concept of holistic integrative pharmacy and its application in teaching practice. Holistic integrative pharmacy will be used to train interdisciplinary and innovative holistic integrative pharmaceutical professionals to meet the requirements of modern society in terms of creation of new drugs and rational use of drugs, and it will contribute to the Healthy China policy.

[Key words] Holistic integrative pharmacy; Educational practice; Healthy China

1 Introduction

The Healthy China strategy outlined in the report of the Nineteenth National Congress of the Communist Party of China has placed Chinese medical and health undertakings in a strategic position in national priority development. The National Conference on Undergraduate Education of Higher Education in New Era (held on June 21, 2016) of the Ministry of Education put forward a clear requirement for the cultivation of the qualities and abilities of undergraduates in China through adherence to the principle of regarding undergraduate education as a foundation and promoting the "four returns": return to common

sense, return to duty, return to original aspiration, and return to dream. The development of medical and health care is inseparable from medicine and pharmacy. With its development over time, pharmacy will inevitably emerge from the era of primitive pharmacy and enter the age of holistic integrative pharmacy, a stage of modern pharmacy, that is rapidly expanding after breaking through many barriers in the various disciplines of pharmacy^[1].

Holistic integrative pharmacy was formulated based on the theory of holistic integrative medicine proposed by Fan Daiming^[2]. It caters to the national health strategy and the requirements of quality undergraduate education of the Ministry of Education and provides solutions to many problems existing in the field of medical and health care.

So what is holistic integrative pharmacy, and what does it encompass? Why do we need holistic integrate pharmacy? How can holistic

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integrative pharmacy education cater to the requirements of the new era and train excellent innovative pharmaceutical talents? This paper will systematically expound the connotation of holistic integrative pharmacy and discuss how to develop holistic integrative pharmacy education; it is intended to highlight the development of education pharmacy in China.

2 Background of the pharmacy system

Human beings created primitive medicine, in the early days when they were in the struggle against nature, Pharmacy, like other sciences, comes from the needs of human social practice and material life. It has made a great contribution to the health and reproduction of all mankind. Pharmacy can be divided into three major fields, traditional medicine, chemical pharmacy, and biopharmacy, which have been the major sources of medicine for human disease prevention and treatment.

In the past, there were four branches of traditional medicine in the world: Chinese, Egyptian, Indian, and Roman. Among them, only traditional Chinese medicine has lasted for thousands of years and is widely accepted and still practiced in the world up to today. The other three branches, today, are found only as records in historical documents and have been annihilated with the disappearance of these ancient civilizations^[3].

Chemical compounds can regulate the functions of the body in alleviating, preventing, and diagnosing diseases, which are also referred to, in general, as chemical drugs. The theoretical system of studying chemical drugs is called chemical pharmacy. In past centuries, achievements in chemical drug research have been attributed mainly to the development of chemotherapeutics, pharmacology, and clinical medicine.

The rise of biopharmacy is supported by the emerging field of molecular biology, especially research into genome science, which promotes the development of modern pharmacy. Biotechnology

drugs, monoclonal antibodies, and gene therapy technology have greatly enriched therapeutic strategies. The combination of genome science and modern bioinformatics has revealed the molecular mechanism of many stubborn diseases, making it possible to choose proper drug targets and design rational new drugs, which have become new therapeutic methods^[4].

3 Challenges in the pharmacy system

The system of traditional Chinese medicine has come into being for more than two thousand years. It became a complete theoretical system for the first time after the founding of the People's Republic of China. Since then, thousands of medical schools, universities, and institutes of traditional Chinese medicine have been established in China. Although great achievements have been made after many years of development, the progress of Chinese medicine that it has made is still limited when compared with Western medicine, which has already delved deeply into molecular mechanism. For Chinese medicine, no breakthrough has been made in theory and practice, especially in the connection between theoretical research and modern science.

With the rapid development of biochemistry, molecular biology and structural molecular biology, modern pharmaceutical research is changing from the traditional chemical model to a life science and chemistry combination model. The pharmaceutical science system is stepping into a new theoretical and technological system with life science as its main body and chemistry as its basis. However, the therapies focus mainly on the downstream targets with biological and chemical drugs. It is difficult to treat diseases in a dialectical way as traditional Chinese medicine does. In view of the multi-target patient system, personalized treatment is required to be carried out according to the guidance of the herbal properties such as the four scents and the five flavors and the theories of monarch, minister,

assistant, and guide.

In the era of modern computer information, with the rapid changes in the modern disease spectrum, there are many diseases, such as diabetes, hypertension, cancer and AIDS, that cannot be cured. All of this requires us to understand and master the overall theory of pharmacy in order to research and develop effective and innovative drugs, which will no longer be limited to the field of the traditional Chinese medicine, chemical pharmacy or biopharmacy.

4 Challenges in pharmaceutical development

Pharmaceutical higher education in China has always been a relatively narrow professional education with a narrow field of knowledge^[5]. In recent years, it has been clear that this narrow professional education has met with increasingly difficulties in adapting to the requirements of rapid social development, which has impelled pharmaceutical higher education reform to adapt to social development and progress.

4.1 The gap between pharmacy and medicine

Under the current education system, pharmacy and medical education have been separated for a long time, and thus lacked interdisciplinary integration between them. Doctors focus only on medical treatment, diagnosis and surgery, with little knowledge about the metabolism and the interaction of drugs in vivo, or they pay no attention to these aspects. On the other hand, pharmacists are unable to provide reliable information for rational drug use^[6] due to their lack of medical knowledge under current separated pharmacy and medical education system.

4.2 The gap between pharmacy and pharmacy

At present, in China, education in three major systems of medicine, namely, traditional Chinese medicine, chemical medicine, and biological medicine, is always divided into three different

schools in the same university. Each school has different departments and majors. The more differentiated pharmaceutical knowledge is, the more chance lies that students can only dabble in one field of pharmacy and be completely ignorant of other systems of medicine, which leads to a serious fragmentation of their knowledge. The boundary between chemical pharmacy, traditional Chinese medicine, and biopharmacy seems to be a chasm that separates them and becomes an obstacle to the development of pharmaceutical industry.

4.3 Contradiction between market demand and supply of pharmaceutical talents

The law of market competition and rational resource allocation makes the transfer of resources and the flow of talent an inevitable trend. At present, the main mode of cultivating pharmaceutical talents in colleges and universities in our country is still a single professional model. Their major is too specific and knowledge is too narrow which make them difficult to adapt to the ever-changing market demands, compete with the world pharmaceutical industry, and enter the forefront of science and technology in line with international standards.

4.4 Contradiction between social needs and pharmaceutical development

With the increasing demand for health care, new drug innovation, and rational drug use in the 21st century, China is facing the arduous task of converting from drug imitation to drug innovation. As a result, pharmaceutical education is facing the challenge of cultivating high-quality, innovative pharmaceutical talents. It is difficult for talents with knowledge of only a single traditional pharmacy specialty to adapt to the trends of the new era. In addition, hospital pharmacy work is facing two major conversions: from being drug-oriented to being patient-oriented, and from being drug-supply-oriented to being rational drug-use-oriented.

Society urgently needs high-level pharmaceutical talents with expertise in rational drug use. However, the knowledge structure of hospital pharmacists trained in the past could not meet the requirements of this conversion.

All of these challenges necessitate the establishment of a new pharmaceutical system and its application to modern pharmaceutical education, that is, holistic integrative pharmacy, which can be used to cultivate pharmaceutical talents of a broad professional caliber, with a solid foundation, and interdisciplinary knowledge.

5 Holistic integrative pharmacy

Holistic Integrative Pharmacy is a new pharmacy system that integrates the knowledge, theory, and practice of pharmacy in various related fields and adjusts them according to actual conditions, thus making it more suitable for human health care. The term "holistic" refers to the fusion of different aspects, i.e., the requirement, standard, and result of education. "Integration" refers to reorganization, i.e., is the method, means, and process of education. Holistic Integrative Pharmacy is consistent with the trend of pharmacy history and has a historical and philosophical basis. Holistic integrative pharmacy emphasizes the integration of a wide range of advanced theoretical knowledge and practical experience through an organic scientific mode to achieve a cumulative effect.

Holistic integrative pharmacy is epistemology, methodology and a modern teaching system. Therefore, in a narrow sense, holistic integrative pharmacy breaks the boundaries and barriers of chemical pharmacy, biological pharmacy and traditional Chinese medicine, and integrates the knowledge of the three major pharmaceutical fields to achieve a cross-integration of pharmaceutical knowledge, with basic medical knowledge being its strong foundation. Holistic integrative pharmacy is also an open system, so in its broad meaning, it should include all the new knowledge

that can promote its development. In a sense, it is the integration of all pharmacy knowledge and resources. It includes the various integrations of modern pharmacy and traditional pharmacy, pharmacy and medicine, pharmacy and modern information technology, basic research and application development of pharmacy, pharmacy and humanities, etc.

6 Holistic integrative pharmacy education practices

In 2015, Guangdong Pharmaceutical University began to enroll students belonging to three different fields—pharmacy, traditional Chinese medicine, and biopharmacy—from three different pharmaceutical schools. After many levels of tests, 30–60 students were chosen to form a holistic integrative pharmacy class and be trained in accordance with the theory of holistic integrative pharmacy. We trained those students with the knowledge of interdisciplinary pharmacy, basic natural science, and humanities, and our aim was that they could master broad pharmacy knowledge and skills, and develop into high-quality holistic integrative pharmacy innovative talents.

6.1 Curriculum design

On the premise of a wide field, the curriculum of holistic integrative pharmacy education should be added in a certain number of courses such as humanities and social sciences, medical science, traditional Chinese medicine, and biology, while chemistry courses should be appropriately reduced. First, the current textbooks should include new content to keep up with the development of subjects; second, it should weaken the uniqueness and authority of textbooks and increase the percentage of selective courses and practice, with the task of reading relevant reference books and professional magazines and extracurricular reading materials^[7]. The curriculum should also be adapted to strengthen education concentrated

on fundamental ability as well as computer and foreign language abilities, so that it could cover a wider range of disciplines and provide stronger adaptability for the trained talents.

6.2 Teaching model

An open, comprehensive teaching mode has been constructed by combining the learning and application processes to do the following: (1) Promote research-based teaching and carry out reform of various forms of teaching methods, such as special research-based teaching, lecture-based teaching, summary-discussion-based teaching, interactive teaching between teachers and students, bilingual teaching, and teaching forums conducted by famous teachers. (2) Form a new, diversified teaching mode of student participation through a combination of classroom-based and extracurricular supplements, comprehensive application, scientific research, learning, and application. (3) Encourage an innovative teaching mode, which integrates innovative thinking and methods, experimental design, and scientific and technological training into the teaching process.

6.3 Reinforced practice

A one-center, two-stage, and three-level practical teaching model has been constructed to improve students' innovative ability. The practice includes: (1) focusing on cultivation of ability to innovate; (2) carrying out two-stage training in basic professional skills and practical innovation ability; and (3) training in the three-level innovation ability of conducting normal experiments, comprehensive experiments, and project practice.

6.4 Focus on training quality

We have continuously strengthened the training

quality of holistic integrative pharmacy education by doing the following: (1) Implementing the undergraduate tutorial system and the chief teacher responsible system, as well as strengthening the guidance of students' academic, ideological and political work; (2) Recruiting outstanding students from the schools of Pharmacy, Traditional Chinese Medicine, and Biological Sciences, and implementing a rolling elimination system according to students' score in the first and second grades.

In brief, holistic integrative pharmacy is a new concept which needs to be continuously supplemented, optimized, improved and finally formed into a mature education system for pharmaceutical education, so that it can cultivate more interdisciplinary, innovative and skilled pharmaceutical talents for China.

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