

Establishment and Application of TBL Method in Pharmacology Teaching

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Key Words: TBL; Pharmacology; Teaching Reform; Medicine

Abstract: The establishment and application of TBL method in pharmacology teaching are introduced in this paper, including the setting of teaching objectives, the establishment of new knowledge systems, the determination of different knowledge systems, the preparation of the students and teachers, and the evaluation methods for the teaching effects. In order to completely break through the limitation of the original pharmacology teaching system according to the teaching objectives, the pharmacology knowledge system was reorganized into four knowledge systems, that is, general pharmacology, disease-targeted, new drug research and development-targeted, and drug safety evaluation-targeted systems. The establishment and application of TBL method is an exploration aiming to improve the teaching level in undergraduate students. The feasibility and actual effect are subject to proof. It can be expected that TBL teaching can become a new mode to promote and improve the teaching quality of pharmacology, and may be popularized in the course of pharmacology or other disciplines in colleges and universities in the future.

Introduction

Pharmacology is a double bridge subject of medicine and pharmacy, and basic medicine and clinical medicine, and an experimental subject in which both the basic research and clinical application are paid more attention to. Pharmacology covers the knowledge from many basic medical sciences, such as physiology, biochemistry, pathology, microbiology, human anatomy, histology and embryology, and clinical medicine (internal medicine, surgery, gynecology and obstetrics, children, pediatrics, and so on). The contents involved in pharmacology are very extensive and need to be organized well systematically, there is a large amount of knowledge that needs to be memorized, and new drugs and new theories in pharmacology and the related subjects always continue to emerge in large numbers, so that it is generally considered that pharmacology is a course that it is difficult for teachers to teach and hard for students to learn.

At present, it is believed that one of commonly recognized faults for the pharmacology teaching in our country is that the teaching system is to take the teacher as the predominance and the teaching material as the center, the "indoctrination" or "cramming method of teaching" in classroom teaching is mostly used as the teaching mode, and to impart knowledge to the students is always emphasized, but no enough attention is paid to the development of students' intelligence, and the cultivation of students' autonomous learning, innovation ability, research ability and comprehensive quality, leading to a severe limitation of the development in the students' individualization and personality. Therefore, it is imperative to improve the effect of pharmacology teaching and stimulate students' interest in learning to meet the needs for the development of international medicine and pharmacy, and constantly try to explore the mode and methods for the innovation of pharmacology teaching.

The main purpose of teaching reform is to stimulate students' interest in learning, aiming at improving students' autonomous learning ability. However, due to multi-aspect limitations in the conditions, the implementation of teaching reform is not so satisfactory in pharmacology in our school and effects of our several attempts are not so significant. In the process of our teaching reform, as educators, whether we have conducted such a reflection: what is the purpose of our teaching for? Do the students understand why they learn this course? Do they know the guiding significance of the knowledge learned in this course to their future work? In short: what is the ultimate goal of pharmacology teaching? Accordingly, aiming at the incapacity in the description of this course, and the accumulation of the contents and the application of knowledge learned from this course, a new teaching model for pharmacology teaching was established by us, namely target-based learning (TBL)[1-2]. The TBL method was aimed to completely break the original textbook system, and according to the teaching objectives, reorganize and integrate the knowledge of related subjects, such as basic medicine, clinical medicine, research and development of new drugs, drug safety evaluation, etc. to create a new pharmacology teaching system, in order to make the teaching objectives and contents three-dimensional, which was considered to provide a new thought of teaching reform for the training of both pharmaceutical compound and innovative talents[3-4]. The establishment and implementation of TBL method are discussed in this paper.

Setting of the Teaching Objectives

Based on the basic principles of pharmacology, the related knowledge of pharmacology and the other pharmaceutical subjects, and the related basic and clinical medical subjects, were reorganized and integrated to establish four new knowledge systems, and clear the learning objectives for each knowledge system. The learning objectives were tried to be made to closely link to the students' future practice and scientific research, for the establishment of new teaching methods with a distinct characteristic of the trinity of "Learning-Research-Application".

Establishment of the New Knowledge System

Completely breaking through the limitation of the original pharmacology teaching system according to the teaching objectives, the pharmacology knowledge system was reorganized as four knowledge systems, that is, general pharmacology, disease-targeted, new drug research and development-targeted, and drug safety evaluation-targeted systems, as shown as follows.

General pharmacology discusses unique basic concepts and the basic principles of pharmacology, elucidates the relationship between pharmacology and other subjects, clarify the importance of pharmacology knowledge in the future study and work, introduces the latest research results and the relevant dynamic research in pharmacology, and foresights the future direction of development in pharmacology.

In combination of the pharmacological knowledge with typical comprehensive cases in clinic, the knowledge basic medicine and that of clinical medicine were closely linked, the clinical etiology and pathogenesis of the clinical cases were integrated with the disease treatment strategies and the theory of pharmacology knowledge for the teaching, and the pharmacology knowledge, medication rules and medication matters needing attention were highlighted to be illustrated by focusing on the main line of disease treatment with drug therapy.

By referring to the research and development processes of some classical drugs and health foods, and the research and development examples of drugs and health foods in our laboratory, the knowledge of basic courses related to pharmaceutical specialty and the knowledge related to the courses of pharmaceutical specialty were connected, to elucidate the status and role of pharmacology in the research and development process of drugs, in which both the teaching of pharmacological theories by the teachers and the students' participation in the experiments or research in laboratory were taken as the teaching methods.

The system covered the contents including adverse drug reactions and monitoring, drug toxicology, factors affecting the therapeutic effect of drugs, and the interaction among drugs, which could systematically expound the evaluation system of drug safety, and lay a good foundation for the future work in the clinical medicine, the clinical pharmacy, and the research and development of drugs.

Determination of the Objectives of Knowledge Systems

Through the learning of this knowledge system, the students' thinking was enlightened, their learning interest was stimulated, and they could clear the importance of pharmacological knowledge and the methods for learning it, which might enable them to firmly grasp the basic concepts and basic principles of pharmacokinetics and pharmacodynamics, and fully understand the vital role of pharmacological knowledge in the process of clinical drug treatment. The specific objectives and assessment methods included that based on her or his own experiences on the learning of this part, every student was asked to give a presentation about 10 minutes for the understanding of pharmacology. The purpose of the learning was to enable the students to truly grasp the basic knowledge of pharmacology, integrate the related medical and pharmaceutical knowledge in concepts and principles, and understand that pharmacology should be an organic part of medical and pharmaceutical knowledge system.

Some typical and comprehensive cases were selected and the students were asked to contact and experience the actual cases personally, in which the training of students' independent thinking and problem-solving ability was emphasized to learn a way to combine the basic knowledge of pharmacology with that of clinical subjects, achieving the goal to apply their knowledge. The specific objectives and assessment methods were that after given a clinical case or drug case, the students were asked to propose the corresponding treatment schemes and make reasonable explanations for them by analyzing the cases and judging the clinical situations based on the knowledge they had learned.

In this part, the students were required to understand the specific role and importance of pharmacology knowledge in the research and the development of drugs and health foods, an attempt was made to broaden the students' thinking, enable them to organically integrate complex and confusing mechanisms of various drug actions in the different chapters. The specific objectives and assessment methods included that students could be familiar to the basic principles and the process of research and development of new drugs, and able to independently develop several drug research programs.

The objectives of this system were to enable the students to understand the importance of drug safety evaluation in the application of drugs, the factors affecting the therapeutic effects of drugs, the interaction among drugs. The specific objectives and assessment methods included the understanding on the law of interaction of drugs, the general knowledge of drug incompatibility, and how to formulate a drug safety evaluation scheme according their learned knowledge.

Selection and Preparation of the Students

Pharmaceutical and clinical medical undergraduate students were chosen as the study objects. The TBL innovative teaching mode was fully explained to the students prepared before class, in order to let them understand that pharmacology is an important bridge subject connecting pharmacy with medicine, the traditional "indoctrination" centered on teachers should be reformed, they as students should change from the passive acceptance of knowledge to an initiative acquisition of knowledge, from the seemingly logical teaching order of contents arranged according to the chapters and sections to a seemingly random learning order arranged based on the innovative teaching systems, and from the learning of abstract theories to a targeted learning based on the actual needs. It is believed that the fundamental changing from the learning form to the learning content can enable both the students and the teachers to understand that only the students are the main body of the teaching, and then they can change and adapt to the new teaching mode in their mind.

Training of the Teachers

Because most of teachers had been accustomed to the traditional teaching mode and the requirements of the new teaching mode for teachers were higher, it was not so easy for them to meet the requirements of the new teaching mode at the early stage of the implementation of new teaching mode. The teachers were strictly trained in it. They were required to prepared a lot for the implementation of new teaching mode before class, including that they should have more comprehensive reserves of the basic knowledge, knowledge of pharmacy-related subjects and knowledge of clinical medicine, transform themselves fully to the new teaching mode in their educational idea to consciously abandon the traditional one-way classroom teaching thinking mode and initiatively establish a two-way innovative teaching thinking mode. The teachers were encouraged not to satisfy only with the dissemination of the basic knowledge and theory, but to guide the students to actively carry out TBL teaching, stimulate the students' subjectivity, and help the students change from the passive learning to an active learning, for realizing the teaching of three-dimensional thinking. The teaching team should strive to take the improvement of the students' ability and professional quality to become adaptable talents as the teaching objectives. In order to achieve the objectives, the teaching contents should not be limited to the knowledge taught or the knowledge included only in this subject, but the continuous integration of knowledge of related basic medical courses, clinical medical courses and other related pharmaceutical courses to break through the original teaching system for the achievement of a close and organic integration of the interdisciplinary knowledge, and the realization of the three-dimensional teaching of objectives and contents.

Evaluation of the Teaching Effects

By the end of the teaching with TBL method, namely the new teaching mode, the students were asked to give topics on the teaching, receive the questionnaire survey and were examined. The teaching effects with the new mode were evaluated by the students' performance during the teaching, questionnaire survey results and the analysis on the students' results.

Conclusion

The establishment of TBL method is a bold attempt in the teaching reform of our university, and an exploration aiming to improve the teaching level in undergraduate students. The application of TBL method in the teaching of pharmacology is only an attempt, and the feasibility and actual effect are subject to proof. In the process to implement the method in the future, we will continue to accumulate the experience on it, summarize the experience, and improve and perfect it step by step, with a satisfactory effect in the next round of our teaching practice. It can be expected that TBL teaching can become a new mode to promote and improve the teaching quality of pharmacology, and may be popularized in the course of pharmacology or other disciplines in colleges and universities in the future.

Acknowledgements

This research work was supported by education research project of Jilin province education department (No. 2014055).

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