

# Application of CBL Combined with PBL Model in Oncology Teaching in Colleges and Universities of Traditional Chinese Medicine\*

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**Abstract**—Because of the lack of knowledge structure and basic knowledge of oncology, the students of universities of Traditional Chinese Medicine have difficulties in understanding the course content, and universities of Traditional Chinese Medicine need to further strengthen training students' clinical thinking and practical ability, which force us to constantly seek teaching methods suitable for students of universities of Traditional Chinese Medicine. The students need some basic knowledge when having oncology courses. Diagnosis and treatment often involve multiple departments, which have a wide and lasting impact on patients. The above characteristics are suitable for PBL and CBL. Therefore, the universities of TCM can improve the teaching quality of oncology course by integrating PBL teaching method and CBL teaching method in clinical teaching, which will provide reference for the teaching reform of other courses of internal medicine of traditional Chinese medicine.

**Keywords**—PBL; CBL; universities of TCM (Traditional Chinese Medicine); oncology teaching

## I. INTRODUCTION

Nowadays, non-communicable diseases have become a worldwide lethal factor. Among them, cancer has an increasingly significant impact on human longevity. As early as in 2015, a WHO study involving 172 countries showed that cancer was the leading cause of human death before

reaching old age, ranking third or fourth in 22 other countries. And that number is growing. The surgery and chemoradiotherapy are the main treatments for tumors. In recent years, with the good supplement of traditional Chinese medicine, the combination of treatment of traditional Chinese medicine and Western medicine can improve the quality of life of cancer patients, reduce toxicity and increase efficiency. Because of its high malignancy, complex condition and poor curative effect, it is also the key and difficult point in the teaching of "Internal Medicine of Traditional Chinese Medicine". By 2018, it was estimated that 18.1 million new cancers (17 million skin cancer without including non-melanoma) and 9.6 million cancer deaths (skin cancer without including non-melanoma) would occur. Because of the differences of lifestyle and development level in different countries and regions, the main factors causing canceration and death are also different. In particular, it is thought-provoking that cancer registration data are inadequate in low- or middle-income countries in one way or another, which is the basis for planning and implementing evidence-based cancer control plans [1]. Cancer patients usually have a long course of disease and complex condition. They are not only suffering from cancer, but also often suffering from many diseases. Therefore, taking TCM oncology as a breakthrough point, reforming and exploring oncology teaching can not only improve the level of diagnosis and treatment of the disease, but also lay a foundation for the study of other tumors. However, there are still many shortcomings in the teaching practice of oncology course in universities of traditional Chinese medicine, which seriously affect the quality of teaching and the training of medical talents. The main problems are summarized as follows. Based on the current situation, the research group tries to carry out teaching reform. CBL combined with PBL teaching method is applied to clinical teaching of TCM internal medicine-oncology in oncology clinical training

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personnel of the First Affiliated Hospital of Guizhou University of Traditional Chinese Medicine, so as to improve the learning efficiency of students and provide reference for the teaching reform of other courses of TCM internal medicine.

## II. SIGNIFICANCE OF TEACHING REFORM OF ONCOLOGY COURSE IN UNIVERSITIES OF TCM AND CURRENT SITUATION OF TEACHING

### A. *Students' Basic Knowledge of Cancer Is Weak*

Clinical departments related to the diagnosis and treatments of tumors include laboratory, pathology and radiology. Clear diagnosis is the primary goal of cancer diagnosis and treatment, but there are often no clinical symptoms in the early stage, leading to the late detection of patients and missing the best treatment period. Early detection, early diagnosis, and early treatment are very necessary, which also reflect the idea of disease prevention in traditional Chinese medicine. Therefore, the basis of learning oncology well is to grasp the basis of pathology, imaging, blood routine, biochemistry and so on, and to understand the connotation and expression of these concepts. However, from the perspective of theoretical teaching and feedback from students' clinical practice, most students are relatively unfamiliar with the above knowledge. The main reason is that in the teaching of basic courses in universities of TCM, the class hours of imaging, pathology and other basic courses are relatively small, and other basic courses seldom involve relevant knowledge points. This leads to the incomplete knowledge structure system of disease diagnosis for students in the universities of TCM. Therefore, when teaching cancer, it is necessary to supplement the basic knowledge of diagnostics and rebuild students' diagnostic knowledge structure.

### B. *Theory Teaching Is Divorced from Clinical Practice, and Students Lack Clinical Thinking Ability and Practical Ability*

Clinical medicine needs the combination of theory and practice. The cultivation of ancient Chinese medicine is inherited through the mode of mentoring and apprenticeship, relying on clinical practice. Modern medicine also attaches great importance to the clinical practice of medical students. Early Union Hospital has combined theory with practice repeatedly in their school-running mode. In addition to theoretical teaching, it also provides students with ample opportunities for clinical practice. With the popularization of medical education and the expansion of medical students' enrollment scale, the existing teaching facilities and teaching time are far from meeting the needs of students in clinical practice. Although clinical probation is arranged, the time of probation is obviously shortened, and the process of probation is difficult to connect with theoretical teaching. Theoretical teaching is gradually divorced from clinical practice. Students often fail to connect theoretical knowledge with clinical practice, and their ability to deal with problems decreases. Not only that, but also weaken the students' practical ability and team spirit. In addition, thinking ability

is very important for the diagnosis of diseases. However, in the current teaching activities, teachers mostly adopt the direct teaching method, which is not conducive to the cultivation of students' clinical thinking ability, besides boring and incapable of arousing students' enthusiasm. The patients that medical students meet in clinic are not as typical as those recorded in books. Most often, they need to synthesize the knowledge of many disciplines to make differential diagnosis, and finally put forward the optimal scheme. Therefore, inserting clinical cases in the classroom, cooperating with multiple disciplines, simulating the real scene of patients' visits, and making students actively participate in the analysis and discussion can make up for the shortcomings of clinical practice, and then cultivate students' clinical thinking ability. In addition, the application of multiple disciplinary team (MDT) teaching models in oncology teaching can also significantly improve the theoretical level and clinical disposal ability of clinically trained physicians. It is worth popularizing and applying in clinical teaching and research departments, so as to train more excellent physicians into clinical practice [2].

Therefore, in teaching the course of TCM oncology, on the one hand, the teachers should teach the basic knowledge of oncology to students, so that students can more systematically and firmly grasp the diagnosis and identification of diseases; on the other hand, the teachers should pay attention to training students' practical ability and clinical thinking ability in the classroom. Therefore, the implementation of oncology methodology reform has become an important issue for basic medical educators in colleges and universities [3], [4], [5].

## III. APPLICATION OF CBL COMBINED WITH PBL TEACHING METHOD IN ONCOLOGY OF TCM

### A. *The Combination of PBL and CBL Teaching Methods*

Problem-based learning (PBL) makes students have strong exploratory, initiative, problem-based and participatory abilities through the five-stage education of "raising questions, collecting data, establishing hypotheses, proving hypotheses and summarizing", which can stimulate students' interest in learning and cultivate students' ability to solve comprehensive problems. This is a new teaching method, that is, "problem-based, student-centered, teacher-guided" teaching method [6]. Compared with the traditional cramming medical teaching mode, this method is more conducive to cultivating students' ability of finding, analyzing and solving problems and clinical thinking. However, the implementation of this method requires students to have certain knowledge structure, consult data and collect information separately. If students lack the knowledge structure system and the ability to consult data, this method will be difficult to be promoted. Therefore, in the process of implementation, if this method is used alone, the teaching effect will be not ideal. Thinking ability is very important for the diagnosis of diseases. However, in the current teaching activities, teachers mostly adopt direct teaching method, which is not conducive to the cultivation of students' clinical thinking ability and mobilizing students'

enthusiasm, besides boring. The patients that medical students meet in clinic are not as typical as those recorded in books. Most often, they need to synthesize the knowledge of many disciplines to make differential diagnosis, and finally put forward the optimal scheme. Therefore, inserting clinical cases in the classroom, cooperating with multiple disciplines, simulating the real scene of patients' visits, and making students actively participate in the analysis and discussion can make up for the shortcomings of clinical practice, and then cultivate students' clinical thinking ability. Case-based learning (CBL) method is a case-centered clinical case teaching method, which is one of the teaching modes advocated by medical education in China and foreign countries. It is a teaching method of "case-based and problem-based" [7]. CBL takes the student as the subjects and the teachers as the guide. It pays attention to cultivating students' ability of self-study, thinking innovation, independent analysis and problem solving. The teaching process simulates the hospital scene as much as possible. Students play the role of doctors and teachers play the role of consultants. Starting from the main complaint, students are brought into the scene of the specific disease diagnosis and treatment process, case analysis and treatment activities are carried out. Finally, a conclusion is drawn about the diagnosis of the disease in the case. Through students' independent thinking and collective cooperation, not only their ability to identify, analyze and solve a specific clinical problem is improved, but also the correct diagnosis and treatment concept, work style, communication ability and collaborative spirit are trained. From the perspective of medical practice, this method is conducive to cultivating students' practical ability, and is also an ideal teaching method in medical education. This teaching method is by no means a simple case teaching or a simple case scenario simulation. Instead, it takes the case as the carrier, interpolates related problems, and inspires students' clinical thinking. In addition, the effective implementation of this method requires students to have certain knowledge structure.

PBL and CBL teaching methods can improve students' clinical thinking ability and practical ability. CBL teaching method simulates the real scene of medical treatment, mobilizes students' enthusiasm, and cultivates students' practice and other abilities, which can be used as the main teaching method. At the same time, interpolating PBL teaching, designing relevant problems, and inspiring the students will be conducive to cultivating students' clinical thinking ability and improving the oncology course as a whole. If the teachers can design related problems in every link of the medical record, make the progress step by step, carry out PBL teaching, and adopt the combination of PBL and CBL, it not only improves the students' interest, but also promotes the students' thinking ability and practical ability.

### *B. Teaching Methods*

Using CBL combined with PBL as the main teaching methods, the students need to use professional terminology in case discussion, quote the contents of textbooks as far as possible, and select three dominant diseases of TCM in oncology department of First Affiliated Hospital of Guizhou

University of Traditional Chinese Medicine: lung cancer, intestinal cancer and breast cancer.

1) *Pre-class preparation stage*: According to the syllabus and students' knowledge background, teachers crawl up corresponding lecture notes, teaching plans and slides on basic knowledge, clinical medical records, problem design and role orientation.

- **Basic knowledge**: It includes classification of cancer cells, basic principles and manifestations of cancer series, CT and MRI, differentiation and treatment of TCM.
- **Clinical case**: It was completed by the physician-in-charge of oncology and teachers above the level. It covers common diseases in oncology, such as lung cancer, intestinal cancer and breast cancer, which should be representative.
- **Question design**: The design should be close to the case data, and follow the diagnostic and analytical thinking design. The students can gradually clarify the characteristics of the case through the answers to the questions, work out ideas, and broaden their thinking through literature learning. And the students can master the diagnosis and treatment of related diseases through differential diagnosis.
- **Role orientation**: Teachers must be trained to recognize their roles, avoiding becoming the role of "teaching" that cannot be tolerated. If necessary, the teachers should guide, summarize and sort out ideas. Teachers are not organizers, but participants, able to discuss with students. Teachers' design of teaching and mastery of teaching process are the decisive factors for the effectiveness of this teaching method.

2) *The stage of teaching in class*: In the first 30 minutes, classroom teaching is adopted, focusing on basic knowledge and informing students in advance to preview relevant basic knowledge. Relevant experts of the department make a statement from their own professional point of view, reduce the statement of treatment experience outside the textbooks, while paying attention to the protection of patients' privacy. Finally, the teachers should make the summary, and students will have a more comprehensive understanding of the disease. In the last thirty to sixty minutes, CBL teaching method is adopted. The teachers of CBL teaching method send complete medical records to their classmates in advance, and inform them of the problems that need to be considered about the case. The students can consult and collect information separately on the case and the given problems, negotiate with each other to complete their respective problems, and complete the relative tasks with division of labor and cooperation. Teachers play the role of counselors to guide but not control the discussion. Students can also coordinate the discussion. Finally, a conclusion is drawn on the diagnosis of the illness in the case, and the teachers should guide the students to sort out the knowledge

they have learned and to set up early clinical thinking methods in this process.

Finally, in the last 30 minutes, the teachers explain the key and difficult points combining with medical records, explain the diagnosis and treatment of various types of tumors, and explain the treatment based on syndrome differentiation.

3) *The stage of analysis and summary*: Questionnaires were sent out to students to understand the teaching effect of various teaching methods in cancer practice teaching from the perspective of student. Teachers think about the implementation process of cancer practice teaching and summarize their experience.

#### IV. CONCLUSION

To sum up, it is difficult for a single teaching method to meet the needs of teaching and to improve students' practical ability and clinical thinking ability. The combination of PBL and CBL can improve students' clinical thinking ability and clinical practice ability. Therefore, if the two teaching methods can be effectively integrated, it will be of great benefit to improve teaching quality and students' clinical thinking and practice ability. Therefore, in the teaching of oncology, CBL and PBL teaching methods are combined to teach clinical training personnel in oncology department, which can enhance students' interest, enable the training physicians to enter the role of clinicians faster, better adapt to the diagnosis and treatment mode of oncology with integrated traditional Chinese and Western medicine, improve the teaching quality of oncology courses, and provide a reference for the teaching reform of other courses of internal medicine of traditional Chinese medicine. This change will change the traditional cramming teaching mode, change the single teaching mode into the integration of various teaching methods, improve the teaching quality of cancer courses, raise the level of students' understanding of the disease, further build the students' oncology knowledge system, cultivate students' clinical thinking and clinical practice ability, and provide ideas for other clinical practice teaching.

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