

Countermeasures on Improving the Teaching Quality of Preventive Medicine in China

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Abstract: With the development of medical education, the importance of preventive medicine has been increasingly recognized. Preventive medicine is not only to deliver knowledge, but also to help the learners solve their practical problems by using acquired knowledge. However, the traditional teaching methods of preventive medicine have so many drawbacks that cannot satisfy the requirements for training medical talents with comprehensive and innovative abilities. Therefore, how to improve the teaching quality to strengthen students' comprehensive capabilities has become an urgent problem for preventive medical educators. Combining with the current status of teaching in medical colleges of China, this article would put forward related proposals for how to improve teaching quality from theoretical teaching, experimental teaching and examinations mode, so as to cultivate practical, innovative and pioneering medical talents for the future.

Key words: preventive medicine, theoretical teaching, experimental teaching, examination mode

Introduction

Preventive medicine is a main subject of medical education in China, and has the characteristics of scientific, practical and strong applicability, belongs to a bridge course between clinical medicine and basic medicine. With the development of medicine and the change of disease spectrum, more and more people pay attention to disease prevention and control. Medical education is no longer simply delivering knowledge via a single instructional method (Epling, & Morrow et al.,2003), it is a growing recognition by medical educators that there is a need to improve prevention and population health education for medical students (Novick, & Lazorick et al.,2011). So the development of modern science and technology provides higher requirements for preventive medical educators to train more medical students to satisfy the social requirements. Nowadays, preventive medicine is one of the compulsory courses for clinical medicine in China, but the students are usually passive learning for scores, while they are ignoring the active learning of knowledge and skills because of the professional contacting alienation between preventive medicine and clinical medicine, so as that most of students are lack of interests to preventive medicine and have the characteristics of high scores and low abilities. Accordingly, it is an urged issue for preventive medical educators to take diversified teaching methods for improving teaching quality and stimulating students' interests of study. Combining with the current status of teaching in medical colleges of China, this article is aimed to detect the possible teaching methods from theoretical teaching, practical application and examinational mode to improve teaching quality and cultivate students'

comprehensive abilities of thinking and solving practical problems.

How to stimulate students' interests from theoretical teaching

Theoretical teaching is the main part of medical education. By theoretical teaching, the students can systematically acquire related medical knowledge. At present, the theoretical teaching of preventive medicine in China usually depends on the lecture-based learning, which is mainly based on teacher-center model and the knowledge delivered to students in a lecture format throughout the class, so the teacher is the primary source of teaching information, while the students are only passive learning. Although this teaching method is controllable, economic and simple(Wang, 2015), it usually makes the students give up active thinking instead of passive acceptance, and it cannot effectively stimulate students' interests of study or improve their comprehensive capabilities. Therefore, during the process of teaching, we must carry on the innovation of education ideal, try to adopt diversified teaching methods while not only depending on the lecture-based learning, so as to stimulate students' interests and strengthen students' abilities of actively thinking and independently solving practical problems. Firstly, according to the arrangement of courses, the teacher can design several problems related to teaching contents of preventive medicine before class, and guide the students to use class time to analyze, discuss and solve these problems. The students actively involve in knowledge construction and application by discussing and solving these problems, while the teacher only serves as a guide to help the students with their learning. For example, when the teachers introduce the clinical manifestations, diagnosis, treatment and

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prevention of environmental or occupational harmful factors (lead, mercury, benzene, et al) to health, they can design some questions based on the clinical cases, and guide students to carry on diagnosis or find out treatments or propose preventive measures. This method can go beyond the simple coverage of teaching contents and promote the understanding of theoretical knowledge. Secondly, the teacher can arrange several seminars according to the teaching contents of preventive medicine during the lecture. The specialists may involve in various fields of preventive medicine, such as environmental health, occupational health, toxicology, epidemiology, et al. By inviting specialists for seminars, it can broaden the students' horizons, expend their knowledge and increase their experience. For example, when the teachers introduce preventive strategy and surveillance of diseases, they can invite the specialist of Disease Control and Prevention Centers to take a seminar. Additionally, when the teachers introduce the diseases caused by environmental or occupational harmful factors, they can cooperate with professional hospitals to organize students to visit and analyze related cases for more understanding clinical manifestations, diagnosis, treatment and prevention. This teaching method can well stimulate students' interests of study and increase their integration with society in the future. Thirdly, we can take Project-based Learning (PBL) method during the teaching of preventive medicine. PBL is considered an approach that aims to actively and independently solve the problems via individuals or small group during the process of learning-teaching. (Kaya, & Lsik et al., 2014) At present, many internationally medical schools are changing their teaching curricula and using PBL programs as their teaching methods (Azer, 2011), but in China, the application of PBL is still in the initial stage, especially in the education of preventive medicine. (Ding, & Chu et al, 2014) In Project-based Learning, the students are assigned a project and they can complete the project to acquire their understanding of knowledge by individuals or groups. (Yang, & Yang, 2013) It has been demonstrated more effective in all domains including theoretical knowledge. (Ding, & Chu et al, 2014) Based on the theoretical teaching syllabus of preventive medicine and the teaching time arrangement, the teachers can design several topics for students according to preventive medical contents and the focus issues of current society before class. The students can choose topics themselves basing on their interests, and they complete the topics after a period of time by internet, books, et al. In the end, the students can participate for the 25-min presentation of interactive teaching in the class or write a summary according to their topics. This method not only can make the students actively involve in learning as they participate in and complete their topics in a personal manner, but also can increase the students' comprehensive abilities by using theoretical knowledge to solve practical problems in the future.

How to strengthen students' comprehensive practical

abilities

Preventive medicine has a strong nature of practice. So it is not only based on theoretical teaching, but also pays great attention to emphasize practical teaching. Practical teaching can better promote students' understanding for theoretical knowledge, and improve their abilities of thinking and solving practical problems by applying acquired knowledge and skills. With the rapid development of society, more and more employer units require graduates with innovative spirits and comprehensive practical abilities of solving problems independently. Therefore, it is an urgent issue for preventive medical educators to seek new methods to strengthen the students' innovative spirits and comprehensive practical abilities. At present in China, the practical teaching of preventive medicine most ignores the combination of theory with practice. It mainly depends on laboratory teaching, and uses the experimental model of verification. That is to say, the teachers usually deliver experimental principles and steps to everyone, and the students passively simulate the experiments only in laboratory. In addition, the curriculums contents and the experimental methods have little change for several years. This situation cannot satisfy the requirements of social development. Therefore, it is important to reduce verification experiments and expand practical teaching methods during the teaching of preventive medicine. Firstly, during the practical teaching of preventive medicine, the teacher should strengthen working practices so as to expand the practical opportunities for students. For example, when the teachers introduce the detections of environmental factors and their biological effects, they may organize the students to related workplaces for on-site monitoring, observing and analyzing harmful factors' occurrence, toxic mechanisms and preventive measures, or let the students carry on detections for local water, soil, air, et al. Additionally, according to the teaching arrangement, the teachers may arrange several visiting class for students in order to acquire modern disease preventive knowledge and improve the abilities of solving practical problems. For example, they can organize students to visit the health supervisions or the disease control and prevention centers, or they can encourage students to enter into communities for carrying on the propagandas of preventive medical knowledge or taking part in the activities of community health service. This teaching method can well enhance the students' practical work abilities of analyzing and solving problems, and it is also an effective way for the students to transform the professional theoretical knowledge into practical works. By this teaching method, it can more better to achieve the purpose of theoretical knowledge in combination with practice. Secondly, during the practical teaching of preventive medicine, the teachers may design several scientific topics for students so as to cultivate their innovative spirits and comprehensive capabilities. For example, according to the time arrangement of practical teaching, the teachers can design some scientific topics at beginning of the term for

students' choice. These topics are based on the relevant contents of preventive medicine or parts of the teachers' scientific researches or hot spots of current society. The students are divided into several groups and each group chooses one topic according to their interests. They may use leisure time or holidays for bibliographic retrieval and designing simple experimental steps. Then they complete these experimental steps by their acquired experimental methods in a period of the practical teaching, and write experimental reports in the end. This teaching method expects the students to work independently and collaboratively in their groups and to acquire useful information from different resources. By this process, the students can develop their scientific innovative spirits and strengthen their comprehensive abilities of thinking, decision, analyzing and operation, so as that they can be better to adapt the actual work in the future.

How to develop diversified examinational modes

Examinations are the important way for evaluating preventive medicine education. It is not only to test students' understanding for knowledge, but also to test students' comprehensive capabilities of solving practical problems by the gained knowledge. Accordingly, the examination should not only cover the contents of theoretical core, but also cover the contents of practical core. At present in China, although the traditional examinational mode (closed-book exam) of preventive medicine is the most popular type of assessment and has an advantage of being easy to quantify (Luo, & Huang et al., 2013), it more emphasizes memorized written exams that fail to test the students' comprehensive capabilities. According to the present examinational mode of most medical schools in China, the exam grade includes two parts: the regular grade and the final exam grade. The regular grade includes attendance, assignments and experimental reports, accounts for 30% of the total grade. The final exam grade is usually carried on book closed examination, and it emphasizes memorized knowledge taught by teachers, rarely involves the practical skills. This simple examinational mode mainly focuses on theoretical knowledge from books, while ignores the improvement of students' practical comprehensive abilities, so it cannot reflect the combinations of latest researches with clinical applications. Accordingly, it is necessary to develop diversified examinational modes for overall reflecting students' abilities. Nowadays, the examinations of most American Universities are basically characteristic of high frequency, which can make the students timely gain the feedback of acquired knowledge through these exams. The examinations should also be throughout the whole process of teaching in China. The final test to students may include

two parts: theoretical examinations and practical examinations, both are accounting for 50%. The theoretical examinations may include closed-book examinations, group discussions, Project-based presentations or summaries, et al. The practical examinations may include field investigational results and comprehensive experimental performance. Among them, the comprehensive experiments can be designed and completed independently by students. Both theoretical examinations and practical examinations can give scores timely according to the performances of students in the process of teaching.

Conclusion

With the deepening of the global health reform, preventive medicine has gained more importance in modern medical education. Traditional preventive medicine education has been difficult to adapt the social development. The educators of preventive medicine must change traditional teaching ideas to develop diversified teaching methods, so as to improve teaching levels and cultivate the talents for the society with innovative spirits and comprehensive abilities.

References

- Azer SA.(2011). *Introducing a problem-based learning program: 12 tips for success. Med Teach, 33(10): 808–813.*
- Ding, X., Zhao, L., Chu, H., Tong, N., Ni, C., Hu, Z., Zhang, Z., & Wang, M.(2014). *Assessing the effectiveness of problem-based learning of preventive medicine education in China. Sci Rep, 4:5126.*
- Epling, JW., Morrow, CB., Sutphen, SM., & Novick, LF.(2003). *Case-based teaching in preventive medicine: rationale, development, and implementation. Am J Prev Med, 24 (4S):85-89.*
- Kaya, H., Senyuva, E., Lsik, B., & Bodur, G.(2014). *Nursing students' opinions regarding project based learning. Procedia-Social and Behavioral Science, 152: 379-385.*
- Luo, Y., Zhou, Q., Huang, J., Luo, R., Yang, X., Gao, Y.(2013). *Medical continuing education: reform of teaching methods about high altitude disease in China. High Alt Med Biol, 14(2):181-182.*
- Novick, LF., Lazorick, S., Clay, MC., Merricks, PA., Daugherty, JC., & Efirid, JT.(2011). *Using clinical skills exams to evaluate medical students skills in prevention. Am J Prev Med, 41(4S3):S181-186.*
- Wang, F.(2015). *Optimization of medical teaching methods. IETI Transactions on Computers, 1(1):22-29.*
- Yang, TH., & Yang, BS.(2013). *Nursing Students' Experiences with Facilitator in Problem-Based Learning Class. Asian Nursing Research, 7: 198-204.*