

On the Multidisciplinary Perspective of Medical Education Model Research and Its Impact on Medical Students' Smoking Behavior

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Abstract: Medical education research is relatively an emerging field, which is not only because of its interdisciplinary nature of pedagogy and medicine, but more importantly, the methods and findings of medical education research are borrowed from research results and literature in the fields of pedagogy, history, sociology, cognition and psychology. This determines the multidisciplinary nature of medical education research. In fact, many research problems are complex and diverse, which requires the use of knowledge and resources in multiple disciplines and fields for understanding or solution. Hence, now more emphasis is placed on interdisciplinary research, rather than pure multidisciplinary research, which is to integrate the theories, thinking and methods of multiple disciplines to jointly study a problem. In medical education research, appropriate use of theories and methods of different disciplines may produce new theories and methods, which in turn may be used for reference by other disciplines and fields. On the premise of this multi-disciplinary perspective, this paper discusses the impact of the change of medical education model on the smoking behavior of medical students, and points out that the non-smoking behavior of medical students is especially affected by the interaction between the role model behavior of teachers in medical colleges and the teaching humanistic environment, Finally, the conclusion is that the research on medical education similar to complex cases needs to be examined from the perspective of integrated thinking and multi-disciplinary.

Key word: medical education model; multidisciplinary perspective; medical student; no smoking behavior
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As an integral part of medical education research, the research of medical education model mainly focuses on the intermediate link in which the concept and practice of medical education interact and create an impact. It is a concept that integrates dynamic development and generalization of characteristics. Therefore, model research also needs to borrow the results of multidisciplinary research. In the rich and diverse model changes of medical education, we should grasp its development trends and distinguish its main characteristics from multiple perspectives. If the research on the connotation, structure, and elements of the medical education model is micro, internal, and horizontal, then the multidisciplinary or interdisciplinary medical education model research is, by contrast, macro, extensive, and vertical.

PROBLEM PRESENTATION

Taking the impact of the transformation of medical education model on medical students' tobacco control behavior as an example, this paper illustrates the importance and guiding role of multi-disciplinary perspective in the study of complex sex education. For medical students, medical education makes them familiar with the harm of tobacco to health, but there are still many smokers among them. They are a typical group of "knowing but not doing, doing but not believing", which is a problem we are concerned about and worthy of research; In addition, most of these medical students will become medical workers or relevant professional practitioners after graduation, and their smoking behavior will largely affect the majority of patients and social public opinion. The study of this population has special social significance.

The survey report on tobacco control among Chinese medical students, initiated by the World Health Organization and completed by the tobacco control research center of the Department of medicine of Zhejiang University, was released in Hangzhou. The survey selected medical students

from 45 colleges and universities in eastern, central and Western China as the survey object. An anonymous questionnaire survey was carried out around the smoking rate, smoking control attitude, second-hand smoke exposure and the implementation of smoke-free campus policy. A total of 9286 valid questionnaires were collected. The report points out that Chinese medical students are seriously lack of tobacco control knowledge, and only 12.7% of medical colleges and universities have carried out formal tobacco control teaching; In daily medical courses, less than 20% of students have received formal training on smoking cessation methods; Although more than 80% of the respondents had a positive attitude towards tobacco control, only 29.4% of the students said that their schools had clear policies and eye-catching tips to prohibit indoor smoking, which was 60% lower than that in other countries¹.

Research shows that some medical colleges and universities in China have carried out tobacco control education. For example, the vice president of China Tobacco Control Association and Beijing Union Medical College have set up elective courses in the school to teach students to understand the harm of smoking and quit smoking. However, at present, in addition to the three schools of Peking University Medical Department, Beijing Union Medical College and Zhejiang University Medical Department, other medical colleges still pay insufficient attention to tobacco control education. For example, some school leaders believe that when medical students learn about bronchitis, lung cancer and other diseases, they already understand the direct relationship between smoking and diseases, and there is no need to put forward tobacco control education separately. However, tobacco control education needs systematic and comprehensive knowledge. Medical students should not only recognize the harm of smoking, but also understand scientific and feasible ways to quit smoking, so as to help patients quit smoking.

Therefore, strengthening the tobacco control education of medical students plays an important

role in the overall progress of tobacco control in China. The decline in the smoking rate of medical students and doctors can be said to be the first step in the decline of social smoking rate. The survey results show that smoking control education is so lacking in medical schools, reflecting the fact that colleges and universities across the country generally do not pay attention to smoking control education. At the same time, the higher smoking rate among doctors is a break between "knowledge" and "practice". Therefore, the knowledge of tobacco control should be included in the regular medical examination and professional doctor examination as a necessary knowledge and test site, so as to increase the attention of students. Colleges and universities should also seriously implement the reference standard for smoke-free schools jointly issued by the health and Family Planning Commission and the Ministry of education to implement the tobacco control education in place. However, the above medical education reform and the transformation of education mode need to be examined and studied from a multi-disciplinary perspective. Only through the multi-disciplinary integration of methods and policies can we effectively promote the transformation of education mode and affect the change of medical students' behavior and habits.

The following is a review of the existing medical education history and medical education related literature to summarize and distinguish the research perspectives in several fields of history, pedagogy, sociology, medicine, and public health management. Scholars in these disciplines have mentioned or paid attention to the evolution, comparison, and motivation of medical education models in their research from different perspectives.

History Perspective

History of Chinese and Foreign Medical Education is the earliest historical material that systematically introduces the development of Chinese medical education from ancient to modern world after the founding of New China. From the perspective of history, the book details the

development course of medical education in China and foreign countries in chronological order based on country, and summarizes the historical experience under the background of educational cognition at that time. Where, regarding medical education history materials about Western medicine, there are many literatures stemming from medical history. The editor of the book also explained in the postscript that he mainly referred to medical history and two foreign medical education history materials². The book is divided into two parts: the first part "History of Chinese Medical Education" and the second part "History of Foreign Medical Education". Where, the first part is written in three parts: ancient, modern and contemporary. In the second part, for each historical period, several representative countries are selected for compilation to highlight the key points and draw inferences about other cases from one instance. Such compilation arrangement helps explain the development context of Chinese medicine and Western medicine (or traditional medicine in other countries), so that we can highlight levels and make reasonable choices among the vast amount of historical data. This also provides detailed information and solid foundation for the historical research and analysis of the medical education model (hereinafter specifically referred to as the western medical education model).

Through the book *History of Chinese and Foreign Medical Education*, we can systematically summarize the evolution history of Western medical education models from the historical development of medical education. Although the required historical data is relatively scattered, by combining research of other famous medical historians or representative literature works, through comparative analysis with contemporary research, relatively consistent evolutionary context and main nodes of the medical education model can still be mastered. At the same time, there are some consensus discourses on the development law and historical experience of medical education, and these discourses are still of great significances in the research on the development of contemporary medical education models, which are summarized in the following four points: 1.

The development of medical education must adapt to the national economy and social development; 2. Medical education should focus on teaching and correctly handle the relationship between medical treatment, teaching and scientific research; 3. Medical education must be closely integrated with social reality and health work. Education is a social project, the medical and health personnel trained in medical education should be people-oriented; 4. Let teachers and students understand the society, which is quite necessary for training medical students and helps improve the teaching quality. The above statements answer the educational questions of what kind of medical talents to train and how to train medical talents in targeted manner. These important questions are not only the fundamental problems to be solved in medical education research, but also central question we should center around in the process of constructing medical education models.

Regarding the question of what kind of medical talents to train and how to train medical talents, many scholars have enumerated a large number of historical facts and expounded wonderful expositions in the historical development track and historical event review through the perspective of history. For example, the Italian medical historian Arturo Castiglioni commented on the *Oath of Hippocrates* in his work on medical history: "Its main meaning is to say that the main purpose of medicine is to heal patients as much as possible, without relying on monks' rituals or divine help in any respect. In addition, all doctors who have taken the oath are free to practice medicine and teach medicine freely." "So, this precious document undoubtedly proves that even before Hippocrates, there existed medical schools that had state regulations and did not rely on the monks³." These evidence-based statements also reflect the changes in medical education ideas and educational models of the time from another aspect. It also proves that the study of medical education from a historical perspective is indispensable and vital in medical education research.

Pedagogy Perspective

In 1972, American educators B. Joyce & M.

Weil co-authored the book *Teaching Model*, which is an earlier systematic study of education and teaching model from the perspective of pedagogy. Although it is a research on teaching model, the book pioneered to introduce model research system into pedagogy, and also provided extensive reference for subsequent research on medical education models. The book believes that the teaching model is a medium through which teachers can obtain a variety of successful teaching methods. The teaching model not only has a strong logic in theory, but also plays an efficient guiding role in practice. The model research is the basis of professional teaching. However, the book also points out that no teaching model is applicable to all students at all times, and successful teaching is often a combination of a series of teaching models⁴. Therefore, the book details almost all advanced teaching models, as well as related pedagogy, psychology, and sociology theories and practical cases, which caused a major change in teacher education. It can be seen that the model research from the perspective of pedagogy is a relatively micro-research, focusing on the training of teachers and their cognition of learning behaviors. These studies were more oriented to teachers' teaching at that time.

In this regard, in his *Education Model and Educational Modeling* and other works, Chinese scholar Zha Youliang has done a systematic research on the education model from the meso-level and methodological level, and explored the relationship between education model and teaching model, educational process, educational structure, educational methods. These series of studies have theoretical guiding significance and methodological use value for the study of educational models in various disciplines.

If we say medical education is a special educational activity for cultivating medical and health talents, then, relative to the study of educational models, medical education model research also reflects the relationship between special laws and general laws. The medical education model is also different with the changes of historical stages and social forms, but the challenges faced in various periods (especially

modern society) are special and professional, which also determines the particularity of the medical education model research. In this regard, the British scholar John A. Dent et al. pointed out in his co-authored book *A Practical Guide for Medical Teachers*: "Medical education must constantly respond to various challenges of different levels, specifically including the increase in medical-related information, the use of mobile technology to obtain medical information, the change in the mode of medical care delivery, and the constantly changing roles of patients due to the fact that patients understand disease information better than in any era⁵." From these discussions, it can be found that although the relevant research on medical education and medical education models mostly proceeds from the perspective of pedagogy to guide educational practice and achieve specific educational goals, the deep theory structure and influencing factors behind it are in complex changes, and these factors affect the medical education reform and the choice of medical education models. For example, the book mentions the four trends of medical education reform: the integration of information, the constantly changing learning situations, courses that are close to reality, and attention to students. How the development of medical education model responds to these trends and changes requires the support, integration and interaction of multidisciplinary research.

For example, like many countries, gender differences are very obvious in China's large and sustained tobacco use. The analysis shows that about 24.09% of male medical students are smokers, while only 1.67% of female medical students smoke. It is regrettable that these figures are still higher than the overall evaluation data of Chinese male adolescents. This shows that despite better medical education, some students will still develop into smokers after entering the University. Fortunately, the smoking rate of male medical students gradually decreased from 33.05% from 1988 to 1999 to 19.71% from 2010 to 2014. The smoking rate of female medical students basically fluctuated between 1% and 2%. However, some studies have pointed out that since the 1980s, the smoking rate of female adolescents has also shown an upward trend, which may be related to

economic globalization, urbanization and the positive promotion of the tobacco industry. Overall, the smoking rate increases with the increase of students' grade. This data increased from 8.94% of first grade medical students to 22.05% of fifth grade students.

Sociology Perspective

The systematic study of educational issues from the perspective of sociology, that is, the emergence of educational sociology, began at the end of the 19th century and the beginning of the 20th century. Educational sociology mainly uses the principles and methods of sociology to conduct research on education as a special social phenomenon.

Many sociologists have always paid attention to the issue of education in the early days of the establishment of sociology in the 19th century. For example, French sociologist August Comte, known as the "father" of sociology, believes that the education system is the central factor that connects and forms society⁶. The American philosopher and educator John Dewey further affirmed the social function of education in his book *Democracy and Education*, believing that schools are the only way that is consciously and carefully planned to educate young people. He pointed out: "Education is the process of life, the continuous transformation of experience, and the only method of social transformation⁷." Contemporary French sociologist and educator Emile Durkheim separated sociology of education from the general sociology and studied it as a special field. In its follow-up works *Education and Sociology*, etc., it is pointed out that education is determined by society, and at the same time, it is a social phenomenon, social process and social system that can have a counterproductive effect on society. Where, it can also induce the logical conclusion that the development of education mode is affected by social factors. Durkheim believes that the entire educational ideology, school curriculum setting and teaching content, etc., are determined by a wide range of social orders, otherwise the goal of human socialization will not be achieved⁸. In this regard, the German sociologist Max Weber has similar expositions, who believes that the

implementation of education must adapt to social changes, especially the changes in the social political system, economic system, and the development of industrial technology. The main function of industrial technology society education is to train people, which is to let individual form a certain social role in the social structure. It can be seen that Durkheim and Weber focused on the macro aspects of education, while Dewey focused on the micro aspects of education⁹. They all conducted groundbreaking researches on education and educational models from the perspective of sociology.

However, for medical pedagogy with the dual attributes of educational science and medical science, in its medical education model research, the perspective of sociology is not limited to pedagogy, but also involves medicine, that is, the field of medical sociology.

Medical sociology mainly focuses on the social causes and social consequences of health and disease, but its research field also involves research on medical education (such as the social behavior of health service personnel, and the social functions of health organizations and systems). For example, the book *Social System* by American sociologist Talcott Parson proposed the concept of "patient role". There are also social medical scientists' discussion and research on the definition of health, etc., which directly or indirectly affect the concept, model and practice of medical education. Research from the perspective of sociology is also reflected in the composition of the elements of the medical education model. For example, the medical sociology scholar William C. Cockerham pointed out in his book *Medical Sociology* that without the control of medical education standards, the professionalization of medicine is impossible; by the mid-1920s, the medical profession consolidated its professional status, so much so that it clearly became a model of professionalism and a powerful profession¹⁰. The book also briefly discusses from a sociological perspective the North American medical education reforms and the corresponding changes in medical education models with participation of the medical educator Abraham Flexner.

The Perspective of Medicine and Public Health Management

Medicine is a discipline whose purpose is to prevent and treat human diseases and improve human health level. Just as the earliest medical sociology work was done by doctors, in history, the earliest medical education work and research were also started by doctors. In medical education, the inheritance and interaction of ideological cognition is also initiated by doctors, patients and his apprentices (or peers).

Chinese scholar Xie Songling argued in the article "The Transformation of Medical Models and the Reform of Medical Education" that the educational thoughts, content and methods of each era are all influenced by cultural background, political system, social economy and scientific thoughts, thus forming a kind of education model¹¹. The transformation of medical cognition and behavior model (i.e., medical model) will definitely affect the change of medical education model. Regardless of medicine or medical education, doctors play an important role in it. In 1977, G.L. Engel, a professor of psychiatry and internal medicine at the University of Rochester School of Medicine in the United States, published an article entitled "Need for a new medical model; a challenge to biomedicine" in the journal *Science*. He first proposed that the biomedical model should be replaced by the bio-psycho-social medicine model. He pointed out: "In order to understand the determinants of disease and achieve a reasonable model in treatment and health care, the medical model must take into account the patient, the environment in which the patient lives, and the supplementary system designed by society to deal with the destructive effects of the disease, that is, the role of doctor and health care system¹²." The above viewpoints expound the medical view that affects modern society not only from the medical point of view, but also from the perspective of public health management and sociology, which also promote pattern changes in the concept, curriculum, method and evaluation system of medical education, etc.

In 2010, the International Committee of Medical Education Experts (including 20 expert representatives in the fields of medicine, public health, and medical education) issued the outlook report titled "Cultivation of Medical and Health Talents in the New Century: Reforming Medical Education to Strengthen the Health System in an Interdependent World", which pointed out: "In the 21st century, the demographic and epidemiological situation has undergone tremendous changes. New infectious diseases, environmental risks, and behavioral risks threaten everyone's health and safety... Unfortunately, the current medical education has failed to keep up with the times and well respond to the above-mentioned challenges...The problems in this are systemic." Faced with the threat of the global COVID-19 pandemic, the report's warnings are very predictable. At the same time, the report also creatively put forward, "Due to the cross-border flow of knowledge, technology, and funds, the large-scale migration of medical and health personnel and patients across borders has caused global interdependence, which has also provided countries with opportunities to learn from each other and solve problems together. In view of this, the redesign of medical education is necessary and imminent¹³." This also means a strong call for medical education reform and the emergence of new medical education models.

DISCUSSION

China signed the WHO Framework Convention on tobacco control in 2005, which launched the mass movement of tobacco control in China. In recent years, China's tobacco control work has made great progress, especially the broad masses' awareness of tobacco hazards has been greatly improved. At the national level, a lot of work has been done in tobacco epidemic monitoring, special investigation, social publicity, tobacco tax reform, tobacco control policy and law making. Many provinces (autonomous regions and municipalities) have taken corresponding tobacco control actions, especially in some big cities. The legislature has drafted local regulations on tobacco control in public places and implemented them in depth.

Medical staff have made a lot of efforts in the publicity of tobacco control, the establishment of smoking cessation clinics and the supervision of smoke-free public places, and have become an important force in tobacco control.

But objectively speaking, China is still the largest country in tobacco production and consumption. The disease burden caused by tobacco is very heavy. Tobacco related diseases such as cardiovascular and cerebrovascular diseases and lung cancer seriously threaten the health of citizens. Compared with countries with better tobacco control, there is still a big gap in tobacco control in China. In this regard, medical personnel should set an example, continue to work hard and devote themselves to tobacco control.

First of all, medical personnel should deeply understand the health hazards of tobacco. At present, many medical personnel have joined the popular science of tobacco control, but many people have insufficient understanding of the harm of tobacco, even superficial. The medical scientific community still lacks scientific research on tobacco control and tobacco harm, and tobacco control lacks excellent data support. This suggests that it is necessary to increase the publicity and education on tobacco control for medical personnel, and encourage and drive more medical personnel to contribute to medical education, scientific research and policy-making related to tobacco hazards. For example, some studies have proved that some e-cigarette advertising features can attract young people, which may be useful in designing evidence-based policies¹⁴.

Secondly, medical staff should become an example of quitting smoking. There are still a considerable number of smokers in Chinese medical staff, which will have an adverse demonstration effect on patients and the public. For medical staff, if they can't quit temporarily, they should also avoid smoking in public places and in front of patients and children. Whether working in medical institutions or health institutions, whether in large hospitals or small clinics, medical staff should set an example and resolutely refuse tobacco products.

Thirdly, medical institutions and medical staff should take the initiative to provide smoking cessation services, especially medical institutions with a certain scale should set up smoking cessation clinics. Managers of medical institutions should recognize the necessity and urgency of smoking cessation and the establishment of smoking cessation clinics, and actively promote the establishment and publicity of smoking cessation clinics, and further study and carry out relevant activities, such as the Population Assessment of Tobacco and Health (PATH) study¹⁵. This is also the social responsibility of medical and health institutions, especially public medical and health institutions.

Finally, the health supervision department should undertake the important task of supervision and law enforcement of tobacco control. At present, the health supervision system is in a critical period of reform, and health supervision institutions at all levels should undertake local tobacco control and law enforcement. Beijing, Shanghai, Shenzhen, Guangzhou and other big cities have accumulated rich experience in health supervision and law enforcement of tobacco control¹⁶. It is hoped that central and western provinces and small and medium-sized cities will also take positive action to implement all the work of tobacco control action.

CONCLUSION

In terms of the cases in this study, doctors are trustworthy behavior models for patients and community residents. If medical students can take the lead in not smoking, actively publicize the harm of smoking in work and life, and help everyone quit smoking, they will play a very important role in controlling the prevalence of tobacco. The most fundamental thing for the continuous implementation and influence of medical students' health behavior is to make corresponding changes to the objectives, methods, courses and evaluation system of medical education. Although this is only a typical case, it can generally reflect substantive issues. Based on this, in the elaboration and research of this kind of problems, a multi-disciplinary research perspective is

necessary and important.

Just as the Swiss medical historian Henry Ernest Sigerist pioneered to introduce theoretical methods of sociology and cultural history into the study of medical history in the 20th century¹⁷, in the field of medical education, especially In the historical research on the evolution of medical education models, it is also quite necessary to selectively introduce sociology and other multidisciplinary theories and methods. This will help us gain systematic and in-depth cognition towards influencing factors and development laws in medical education model reform, and provide a theoretical basis and analysis framework for subsequent related research. Medical and health professionals are the basis of the development of health care. As an important part of on-the-job medical personnel training, the medical education system can not meet the needs of social development under the new situation, so it is urgent to change the concept, reform and innovation. Therefore, paying attention to the essential needs in the development of medical education and discovering its laws, and carrying out relevant research on the reform of medical education models from a multidisciplinary perspective mean great academic value and practical significance for exploring new medical education models that adapt to the ever-changing future.

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