

available at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Minisymposium

The need for integration in health sciences sets the future direction for public health education

L.M. Li^{a,*}, J.L. Tang^b, J. Lv^c, Y. Jiang^{a,b}, S.M. Griffiths^b^a Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, China^b School of Public Health and Primary Care, the Chinese University of Hong Kong, Hong Kong SAR, China^c School of Public Health, Peking University, Beijing, China

ARTICLE INFO

Article history:

Accepted 23 October 2010

Available online 17 December 2010

Keywords:

Public health

Medicine

Education

Integration

SUMMARY

Since the foundation of the People's Republic of China in 1949, there has been remarkable developments in public health in the country. These achievements are primarily attributed to the public health services and patriotic public health campaigns, although the contribution of high-technology medical applications is also recognized. However, along with the recent socio-economic developments and scientific and technological progress, medical disciplines have become more and more specialized, and clinical and preventive medicine have become further separated from each other. Conventional Chinese wisdom says 'when long divided they must unite, when long united they must divide'. At the onset of the new round of reforms of health care in China, it seems important to revisit the discussions on the urgency for integration of health sciences in medicine in China.

Several issues and viewpoints on integrating medicine are discussed in this paper. The biopsychosocial model for health calls for broad integration. Primary care development in China requires integration in education and practice, and in treatment and prevention. Control of chronic diseases requires integrated and united action. Integration of traditional Chinese medicine with Western medicine requires creativity. The integration perspective should be instilled in the minds of medical students. Integration also entails integrated practice. After all, integration entails integrated education and practice in public health education.

Changing the current public health education system still has a long way to go. True integration requires integration of concepts, policies, resources and measures, as well as changes in the organization of health care including public health, prevention and treatment. This needs to be a systematic process. Finally, success of integration relies on social mobilization, advocacy, promotion and attention of the entire society.

© 2010 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

* Corresponding author.

E-mail address: lmlee@pumc.edu.cn (L.M. Li).

0033-3506/\$ – see front matter © 2010 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

doi:10.1016/j.puhe.2010.10.008

Introduction

Since the foundation of the People's Republic of China in 1949, there has been remarkable developments in public health in the country. The health status of both urban and rural residents has improved significantly. For example, average life expectancy has increased from 35 years before 1949 to 73 years in 2005.¹ The maternal mortality rate has decreased from 1500 per 100,000 persons per year before 1949 to 31.9 per 100,000 persons per year, and the infant mortality rate has decreased from 200 per 1000 live births per year to 13.8 per 1000 live births per year in the past 50 years.¹ The incidence of notifiable communicable diseases has also decreased significantly.¹

These achievements are primarily attributed to the public health services and patriotic public health campaigns, although the contribution of high-technology medical applications is also recognized. China's public health services and patriotic public health campaign are characterized by full social mobilization, wide participation, creation and development of the three-tier health service network, prevention-first policies, and creating and maintaining healthy environments and conditions. All of this activity embodies the World Health Organization's (WHO) core concept of 'health promotion'. What lies behind these achievements is the practice of integrating efforts for health and for health care.

However, along with recent socio-economic developments and scientific and technological progress, medical disciplines have become more and more specialized, and clinical and preventive medicine have become further separated from each other. Humanism in medical practice is getting lost. According to conventional Chinese wisdom, history has shown that 'when long divided they must unite, when long united they must divide'. At the onset of the new round of healthcare reforms in China, it seems important to revisit this concept and discuss the urgency for integration of health sciences in medicine in China.

Primary care development in China requires integration in education

Healthcare reform is a key part of China's systems reform. Its target is to establish a basic healthcare system that will cover the entire population, including both urban and rural residents, and provide safe, effective, convenient and affordable healthcare services. Two points are important. The first is the emphasis on the principle of 'public health for all', which is in line with WHO's mission, embodying the spirit of equity. The second is provision of basic healthcare services for the whole population, which is in line with the progress of socio-economic development in China. In developing the new strategy, the public have been consulted through a large-scale consultation on policy formation in China's history. In total, 325,000 responses giving suggestions and advice on the modification of the healthcare proposals were submitted and 39,000 suggestions were adopted.

The healthcare reforms aim to establish four major systems. The thinking is in line with the well-known concept

in traditional Chinese architecture that the four-beam and eight-column structure is the most stable.^{2,3} The model for China's new public health is thus also built on a structure of four major systems and eight functions and conditions.⁴ The four systems are the medical service system which will continue to be improved, the public health service system which will be further strengthened, the medical security system which will be built up, and the pharmaceutical supply system which will be secured. The eight functions and conditions referred to are management, auditing and governance, operations, innovations and professional talents, financing, informatics, pricing and law.

The healthcare reforms require the set-up of an effective primary healthcare system to support the practice of community-based primary health care, and to protect and improve the public's health by providing public health prevention and primary clinical care and treatment in a highly integrated manner. China is a developing country in which the rural–urban difference is likely to continue for a long time. To reduce healthcare inequality, both urban and rural residents need to be able to access basic healthcare services. To achieve this objective, we need to be able to rely on policy, systems, professional teams and resources. The integration of clinical and public health education is necessary for professionals to be effectively trained to deliver basic healthcare services, which combine preventive and clinical services, to the public in the primary healthcare setting.

The new biopsychosocial model for health entails broader integration

Medical education in mainland China is largely built on the biomedical model of diseases. Germ theory remains the primary focus, and the concept that disease is physical and a malfunction of the biological body plays an important role in basic medical education. This model has inspired people to enthusiastically and constantly explore the mysteries of the human body. It has indeed been successful in leading to discoveries such as biological agents that cause infectious diseases, use of antibiotics, theories of immunology and the structure of DNA. These theories and interventions have played an important role in control of the epidemics of some common infectious diseases, led to the cure of some previously fatal diseases, and considerably prolonged the life expectancy of mankind. However, these successes seem to have led to non-belief in the fatalism of disease, and led to some unrealistic optimism about the biomedical model.

However, the biomedical model has shown some obvious limitations. In this model, an individual is simply taken as a machine. Doctors treat symptoms rather than the disease; they treat the disease rather than the person. Thus, the head is treated when the head aches; the foot is treated when the foot hurts. As a result, disease has become more important than the person, and treatment is taken to be superior to prevention. We are tempted to think that medicine is all about the treatment of disease, rather than recognizing that the fundamental objective of medicine is to maintain health and improve the quality of life, which can only be partly accomplished by treatment. Modern medical research pays

overwhelming attention to the impacts of genetics, which has, to a large extent, shaped the current system and culture of research, education, practice, financing and development in medicine.

In 1976, Thomas McKeown^{5,6} wrote that that only some 10% of the decline in mortality from communicable diseases in the past 200 years⁷ could be attributed to discoveries in basic sciences and therapeutic innovations including bacteria and antibiotics, while most of the reduction was attributable to the improvement in sanitation, personal hygiene, nutrition, environments and change in people's behaviour. Thus, the biomedical model is unable to satisfactorily explain and effectively deal with many of the challenges we are facing, such as human immunodeficiency virus/acquired immunodeficiency syndrome, drug abuse, alcoholism and depression. Smoking, physical inactivity and unhealthy diet are all influenced by the environment in which we live.

The biopsychosocial model emphasizes that there are many other important determinants of health that have not been given sufficient attention, such as natural and social environments, education and employment, and organization and delivery of healthcare systems. However, the approach to public health needs much broader efforts for integration of all the efforts which contribute to health. The importance of shifting from the biomedical model to the biopsychosocial model has been widely recognized.^{8,9} However, changes have yet to be made in medical education and curriculum development in China to respond to this shift.¹⁰ The new education agenda and curriculum requires integration of even broader disciplines related to health.

Control of chronic diseases requires integrated action

Cancer, heart disease, cerebrovascular disease and respiratory disease have become the main causes of death in both urban and rural China. Injury and poisoning rank fifth. Chronic diseases are now the major disease burden in the country, with 79% of deaths and 70% of disability-adjusted life years caused by chronic diseases.¹¹ In 2005, 62.5% of disease costs (including direct or indirect costs) in China were incurred in treating chronic diseases, and these costs are likely to continue to increase as the prevalence of chronic disease increases in the future.¹² The current burden of disease reflects the level of exposure to risk factors in the past, and the future burden of disease will depend on the current level of exposure to risk factors. The rapidly increasing prevalence of some modifiable risk factors and intermediate risk factors in China shows that action is needed now.

Prevention and control of chronic diseases requires comprehensive and integrated action from even broader disciplines. For example, distal risk factors in the causal chain of major chronic diseases, notably the underlying socio-economic, cultural, political and environmental determinants, have been more widely recognized in recent years.¹³ Medical measures alone are not enough to tackle such factors. This is also true of medical education that is based on the biomedical model.

Integration between Chinese and Western medicine requires creative thinking

Traditional Chinese medicine (TCM) has a long history. Traditional or alternative medicine may formally play a relatively small role in health care in Western countries, whereas in China, it remains an important and integral part of the healthcare system. Since the foundation of the People's Republic of China, the nation's health policy has always sought 'to unite TCM and Western medicine' and 'to integrate TCM with Western medicine'. There is thus a natural need in China for integrating traditional medicine with Western medicine. However, debates arise when it comes to the question of how to integrate TCM with Western medicine. The integration is expected to achieve a mutually beneficial relationship between the two, and the highest form of integration would require integration in theories and generate new theories.

TCM differs greatly from Western medicine. TCM views health and disease from a rather philosophical point of view and considers an individual in a holistic way.¹⁴ It emphasizes the importance of balance of 'yin' and 'yang' for the health of a person; a concept that does not exist at all in Western medicine. TCM has always emphasized prevention and long believed that a healthy lifestyle and diet are important for health. TCM also emphasizes not only 'pathogens' but also 'emotions and sensory pleasure' in understanding aetiology and in the prevention and treatment of disease; the dialectical approach to diagnosing and prescribing in TCM emphasizes holistic and individualized treatment, while Western medicine tends to take a more reductionist approach. The treatment of coronary heart disease is probably a fine example of the reductionist approach, where treatment has largely become a catheter and stent craft.

In addition, development of highly specialized care has caused loss of true holistic care in Western medicine. Integration in the form of interdisciplinary communication and interaction with Western medicine as practised in China in past decades is often a mechanical and superficial model for integrating between TCM and Western medicine. However, it may have jeopardized the long-term development of TCM. Integration between TCM and Western medicine requires new wisdom, new thinking and new methods.

Integration perspective must be instilled in the mind of medical students

Public health is fundamental to improving the health of the public, which seeks to create supportive environments for health.¹⁵ It is impossible for many public health measures, including policy enforcement and legislation, environment protection and improvement, life-course care, and public health emergency preparedness and response, to be implemented by the public health sector alone. Therefore, multi-sector co-ordination, social mobilization and involvement are very important. One of the aims of the recent public health education reforms is to instill a perspective of integration between the individual and the population approaches in medical students, since they will be the main vehicle for

implementing integration of medicine and public health in practice in the future, contributing to the ultimate aim of a comprehensive approach to health and health care.

Integration entails integrated practice

Medicine is an applied science. A doctor cannot be qualified without enough practical experience. Medical practice not only improves students' professional skills, but also helps them to understand the health issues from a broad perspective. Moreover, practice helps students to improve their interpersonal and communication skills, and to develop critical thinking skills. Comprehensive and integrated practice, including practice in both urban and rural areas, in affluent and deprived areas, in hospitals of different levels, in communities, in both medical and public health institutions, and in research, are essential for training medical students.

Greater integration of clinical practice and preventive medicine will help to address the problem of the overwhelming emphasis on treatment rather than prevention. Practice integrating hospital and community care will help students to recognize the social aspects and impacts of medicine, and fill in the gap between disease management and health management. Practice integrating medical research and clinical practice will help to secure the translation of research into practice. Practice integrating medical practice and health policy will help students to see the role of medicine in society and to examine medical care from a broader societal perspective. These integrations will provide medical students with much broader fields and domains to explore. However, most importantly, they will support medical students to practice effectively and achieve the fundamental goal of medicine, which is not just to treat individuals effectively, but to protect, promote and secure the health and health care of their populations. It will engage them in public health.

Implications of integration for future public health education

Comprehensive integrated medicine points to the future direction of public health education. The ultimate goal of the medical reforms is to provide basic medical care for all, and to ensure equitable accessibility to public health services. Integration between public health and clinical services is essential to achieve such a goal. An equitable healthcare system needs to have accessible public health services, reliable and effective organizations and systems, fairness in content and priorities, and efficiency in deployment of human resources for health care and their quality. All these would require public health education and training to be based on a multidisciplinary approach.

Conclusion

Disciplines in health-related sciences have long been divided; practice has become more and more specialized. Important

opportunities and methods may have been missed because of the ever-increasing division. New opportunities and methods may appear if we see medicine at a higher and integrated vantage point. Indeed, a more integrated approach to medicine is emerging.

China's current public health education system is largely based on the old Soviet biomedical model with five core health disciplines concentrated on sanitation and hygiene. A national group on public health education has discussed and formulated six basic requirements for future public health education in China.^{16,17} Changes have started, but there is still a long way to go before the model for training is changed and integration of clinical and public health education truly takes place. This will not be easy. We need to see integration of concepts, policy, resources and methods as well as changes in the organization of health care, including public health, prevention and treatment. This needs to be a systematic process. No single person or department can achieve the grand goal of the integration. The integration relies on social mobilization, advocacy, promotion and attention of the entire society.

Ethical approval

None sought.

Funding

None declared.

Competing interests

None declared.

REFERENCES

1. Ministry of Health. PRC. Chinese health statistical digest. Beijing: Ministry of Health, PRC. Available at, <http://www.moh.gov.cn/publicfiles/business/htmlfiles/zwgkzt/ptjty/digest2010/index.html>; Beijing: Ministry of Health, PRC; 2010. last accessed August 2010.
2. Steinhart NS. *Chinese architecture*. New Haven: Yale University Press; 2002. p. 1–5.
3. Lui XJ. *Chinese architecture – the origins of Chinese architecture*. New Haven: Yale University Press; 2002. p. 5–15.
4. Central committee of the communist party of China and state council. guidelines on deepening the reform of the healthcare system. Beijing: Xinhua News Agency. Available at: http://www.gov.cn/jrzq/2009-04/06/content_1278721.htm; 2009 (last accessed August 2010).
5. McKeown T. *The role of medicine: dream, mirage, or nemesis?*. London: Nuffield Provincial Hospitals Trust; 1976.
6. Bill B. The McKeown thesis. *Lancet* 2008;**371**:644–5.
7. Santrock JW. *A topical approach to human life-span development*. 3rd ed. St. Louis, MO: McGraw-Hill; 2007.
8. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science* 1977;**196**:129–36.
9. Sarno JE. *The mindbody prescription: healing the body, healing the pain*. New York: Warner Books; 1998.
10. Griffiths SM, Li LM, Tang JL, Ma X, Hu YH, Meng QY, et al. The challenges of public health education with a particular reference to China. *Public Health* 2010;**124**:218–24.

11. Wang LD, Kong LZ, Wu F, Bai YM, Burton R. Preventing chronic diseases in China. *Lancet* 2005;**366**:1821–4.
12. Information Center of Ministry of Health, PRC. China burden of disease study. Beijing: Information Center of Ministry of Health, PRC. In press.
13. World Health Organization. *Preventing chronic diseases: a vital investment*. Geneva: WHO; 2005.
14. Tang JL, Liu BY, Ma W. Traditional Chinese medicine. *Lancet* 2008;**372**:1938–40.
15. Aday LA, editor. *Reinventing public health: policies and practices for a healthy nation*. San Francisco: Jossey-Bass/Wiley; 2005.
16. Essential requirements in public health education. ERPHE Group, ChengDu: ERPHE Conference. Available at: <http://jpkc.zzu.edu.cn/lxbx/zfile/ggwsyq.htm>; 2006 (last accessed August 2010).
17. Chen KL, Ma X, Zhang JX, Luan RS, Liu Y, Li Y, et al. Investigation and analysis of cognitions and attitudes on essential requirements in public health education. *Mod Prev Med* 2009;**36**:62–6.