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Kaijun YU, Yi LIAN, Shuo YANG

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To Examine the Effect of Government Governance of Medical System on Public Health by Using the Regression Analysis

Kaijun YU[1], Yi LIAN[2], Shuo YANG[3]

Abstract

The advance of medical technology undoubtedly could enhance personal health and public quality of life. Economically developed countries are developing toward national comprehensive care. In other words, the provision of national comprehensive health care is the common wish of the citizens and the government. Developed countries have almost achieved such a standard. However, the increasing national medical expenditure and medical expenses have such countries suffer from rising medical expenses in past years. The difficulty in fund raising becomes the common problem in such countries. There are several factors, including increase in income, extension of life expectancy, population aging, advance of medical technology, and increase in the supply of medical care. Nevertheless, it is wondered whether the increase in medical expense, personnel, and medical facilities would essentially enhance health care utilization to enhance national health. Taking medical systems in Shanghai as the research object, open statistical data of the government are used as the research data for analyzing the effect of governmental governance of medical system on public health. Research results show significantly positive correlations between 1.the governance of medical systems and composition of population, 2.the governance of medical systems and health conditions, and 3.the governance of medical systems and health resources. According to the results, suggestions are proposed, expecting to provide reference for domestic health care policy reform.

Keywords: governmental governance, medical system, public health, medical resources.

[1] Shanghai University of Medicine & Health Sciences, Library, Shanghai, CHINA. E-mail: yukj@sumhs.edu.cn

[2] Business School, Guilin University of Technology, Guilin, CHINA. E-mail: lianyi6363@163.com *(Corresponding author)*

[3] Guilin University of Technology, Admission and Employment Office, Guilin, CHINA. E-mail: 617641811@qq.com

Introduction

The advance of medical technology undoubtedly could enhance personal health and public quality of life. Nevertheless, it is discovered, from the aspect of patients, that an individual requiring for medical service due to health factors could hardly have free choice of the basic right because of serious information asymmetry between doctors and patients, in the doctor-patient interaction in actual medical field. In this case, the dissatisfaction with clinical medical treatment is often caused by considering not being fairly concerned and cared. Moreover, under the traditional social culture, people would seek medical attention with multiple choices, due to various factors of growth background, education environment, awareness of disease, and trust of treatment. Basically, each cultural background is accumulated by distinct bases to appear generate specific public medical system. For instance, domestic people are deeply affected by traditional Chinese medicine and alternative civil therapies that non-mainstream medical treatments are still popular in civil society. Domestic people therefore present diverse behaviors on seeking medical attention. What is more, complicated departments and changing medical technology have the division of medical profession be finer and the information asymmetry between doctors and patients become obvious. Some researchers considered that physicians were capable of inducing patients' needs for medical care. The academic meaning referred to physicians, due to various self-benefit factors, playing the role of incomplete agent in the medical care stage to guide patients increasing extra needs for medical care in the medical attention seeking process and maintain the target income in the competitive environment or inadequate demands. It would affect the making of medical policies and the practice effectiveness. Economically developed countries are developing toward the provision of national comprehensive care. In other words, the provision of national comprehensive health care is the common wish of the citizens and the government. Development countries, except the USA, have almost achieved such a standard. However, the increasing medical expenditure and rising medical expenses become the major problems of such countries. For this reason, the effect of governmental governance of medical system on public health is studied, expecting to provide reference for domestic health care policy reform.

Literature review

The governance of medical systems

Hsieh (2018) classified medical systems and pointed out three factors in the attribute of medical system of a country: (1) Economic standard: Napoles et al. (2015) divided into developed, developing, undeveloped, and socially traditional countries with rich resources. Economic standard would affect the disease,

epidemic disease, health manpower and facilities, and medical technology of a country; (2) Political intervention or marketization: According to the marketization of medical systems or the intervention of the government to decide whether the public could acquire medical care, medical allocation, and financial burden for seeking medical attention, Thompson *et al*. (2016) divided it into entrepreneurial & permissive, welfare-oriented, universal and comprehensive, and social & centrally planned; (3) Cultural factor: Toth et *et al*. (2015) indicated that it covered religion, language, race, and custom. Roemer regarded it being hard to make the classification (Herrinet *et al*., 2015). Abdelkafi & Tauscher (2016) mentioned that some countries regarded medical care as general products and followed the law of market for the consumption and production (e.g. the USA and Switzerland), some were highly intervened by the government (e.g. the UK, France, and Taiwan) to lead, plan, and even establish the allocation of medical resources as health care was regarded as public property to protect the citizens acquiring appropriate medical care with social collective power. Reim, Parida, & Ortqvist (2015) pointed out several dimensions of governance, e.g. the citizens legally acquiring medical care, single or diverse insurance, centralization or decentralization, government administration or autonomous management of doctor- and patient-related groups, and medical care providers being public hospitals, non-profit private hospitals, or profit hospitals. Berghout et al. (2015) pointed out the composition of a medical system as governance, organization, resource, financial support, and service provision; such departments showed mutual effects and restraints and commonly determined the medical system performance. Roome & Louche (2016) contained three indicators of performance as health, responsiveness, and financial risk protection. Dowbor *et al.* (2015) indicated that governance and organization were policies, financial support indicators included per capita gross domestic product (GDP), per capita health expenditure (HE), ratio of medical expenditure in GDP, and medical resources contained medical personnel and facilities.

Referring to Tunget al. (2017), the governance of medical systems in this study is measure with following dimensions: (1) Health expenditure ratio: The ratio of public sector expenditure in total medical expenditure reveals the degree of public intervention; (2) Public-private hospital ratio: Medical providers contain public hospitals, non-profit private hospitals, or profit hospitals.

Public health

Hunget *et al*. (2017) defined health from physiological and psychological parts. Physiological health referred to physically without any disease symptoms or an individual being able to execute the activity function and self-care. Horwitzet *et al.* (2017) regarded psychological health as a person without any worries to affect the psychological effectiveness. Grahamet *et al.* (2015) pointed out health as individual physical, mental, and spiritual balance that it was important to select suitable indicators for evaluating public health conditions. Auerbachet *et al.* (2016)

combined clinics with epidemic disease and indicated that 5Ds could evaluate health results. 5Ds referred to death, disease, discomfort, disability, and dissatisfaction. Death referred to unnatural termination of life; disease, as illness, was the public subjective experience in diseases; discomfort referred to uncomfortable symptoms, such as pain and sickness; disability referred to not being able to engage in daily living functions in family, work, or entertainment; and, dissatisfaction indicated the emotional reaction to diseases or care, e.g. sadness and anger. Hunter-Adams & Rother (2017) stated that health indicators traditionally referred to life expectancy, infant mortality rate, and maternal mortality rate. Bocken, Rana, & Short (2015) indicated that DALE (Disability-Adjusted Life Expectancy) was mostly used for measuring health in past years.

Referring to Chinet al. (2016), the following dimensions are applied to measure public health in this study: (1) Composition of population: population age; (2) Health conditions: public fatality rate; (3) Health resources: number of medical institutions and medical personnel.

Research hypothesis

van Rosse *et al.* (2016) pointed out the objectives of a medical system as health, responsiveness, and financial risk protection. Martins, Rindova, & Greenbaum (2015) mentioned that national medical care stood for the degree of governmental intervention (public sector health expenditure ratio), which was the most important dimension in governance with the most profound influence. The protection of public medical care would affect public health care. Dharmarajanet *et al.* (2017) pointed out the relationship between governance, economic development (per capita GDP), per capita HE, and the ratio of individual medical expenses in the GDP (HE as % of GDP), medical resources and medical service utilization that medical utilization was related to public health. Merkowet *et al.* (2015) considered that a medical system should provide comprehensive health care service through vertical integration to be responsible for promoting the health conditions of local population. In this case, an independent hospital without competitiveness would be hard to survive. The governance of medical systems aimed to manage the vertically integrated medical organization members. The governance of medical systems therefore became complicated and the reform structure of the governance of medical systems was particularly important. The following hypotheses are further established in this study.

H1: The governance of medical systems shows significantly positive correlations with composition of population.

H2: The governance of medical systems presents remarkably positive correlations with health conditions.

H3: The governance of medical systems reveals notably positive correlations with health resources.

Methodology

Research object

Taking medical systems in Shanghai as the research object, the governmental open statistics data are used for analyzing the effect of governmental governance of medical system on public health.

Results and discussion

Correlation analysis of the governance of medical systems and public health

With regression analysis to test the hypothesis and the theoretical structure, the first regression, *Table 1*, achieves the significance (F=32.441, p<0.001) that the governance of medical systems shows remarkable effects on composition of population. Health expenditure ratio and public-private hospital ratio reveal notable effects on composition of population (β=2.241***, p<0.001; β=2.318***, p<0.001). H1 is therefore supported.

The second regression, *Table 1*, reaches the significance (F=37.538, p<0.001) that the governance of medical systems appears significant effects on health conditions. Health expenditure ratio and public-private hospital ratio presents remarkable effects on health conditions (β =2.162***, p<0.001; β = 2.196***, p<0.001) that H2 is supported.

The third regression, *Table 1*, reaches the significance (F=42.617, p<0.001) that the governance of medical systems reveals notable effects on health resources. Health expenditure ratio and public-private hospital ratio appear significant effects on health resources (β =2.427***, p<0.001; β = 2.533***, p<0.001). Accordingly, H3 is supported.

Table 1: Regression analysis of the governance of medical systems and public health

dependent variable→	public health					
independent variable↓	composition of population		health conditions		health resources	
the governance of medical systems	β	ρ	β	ρ	β	ρ
health expenditure ratio	2.241	0.000	2.162	0.000	2.427	0.000
public-private hospital ratio	2.318	0.000	2.196	0.000	2.533	0.000
F	32.441		37.538		42.617	
P	0.000***		0.000***		0.000***	

R2	0.314	0.363	0.405
adjusted R2	0.291	0.344	0.378

Note: * stands for $p<0.05$, ** for $p<0.01$, and *** for $p<0.001$.

Conclusion

The research results show that the governance of medical systems could present the degree of the government investing social resources into health care. The more public section health expenditure, the more attention to the fairness of resource allocation and the response to public needs would be paid that the invested resources for preventive health would increase. The urban-rural distribution of basic health care and medical resources should be emphasized to enhance the accessibility of health resources (increase in utilization) and effectively promote public health. In face of the highly uncertain environment in health care industry, hospitals have to look for changes in management for the survival. Three indicators would drive the change of a hospital, namely "cost control", "quality promotion", and "function improvement", which are equally important. Under the strict policy control, it is difficult for the balanced development of a single hospital. It has to select and apply strategies, to acquire management advantages, through effective governance model, and to develop in the environment with limited resources.

Recommendations

Aiming at the research results, the following suggestions are proposed in this study.

1. The ratio of government health expenditure in total medical expenditure could effectively affect public health. In this case, the government health expenditure should be enhanced to expand public finance, and the government should broadly notice the citizens for cherishing and supporting the governance of medical systems.
2. A lot of people would repeatedly seek medical attention and collect medicine. In addition to satisfying the sense of security when suffering from illnesses, the public do not understand the purpose and reason of government policies, and have no channels to understand, but simply think and cope with the life experience. As a result, in spite that physicians need to receive new knowledge, the public should have the willingness and opportunities for re-education.

3. Current examination systems of the governance of medical systems focus on the control of medical expenses, but ignore the holistic health care in the entire medical environment. It is suggested to effectively supervise physicians including friendly factors in the diagnosis and treatment process, while evaluating the appropriateness of diagnosis and treatment process, in order to promote the overall medical quality.

Acknowledgments

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