

Analyzing the Mechanism of Intelligent Medical Care to Improve Doctor-patient Relationship under the Background of Big Data

Wuniu Jida

School of Politics and Public Administration, Guangxi Normal University, Guilin, Guangxi, 541006, China

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Abstract: With the rapid development and wide application of big data technology, smart healthcare, as a brand new form of healthcare, is gradually reshaping the traditional way of healthcare services. Through literature research and other studies, this paper aims to explore how smart healthcare can improve the doctor-patient relationship in the context of big data and analyze the mechanism of action behind it. To enhance the overall quality of healthcare and patient experience, the following recommendations are proposed. First, hospitals should invest in upgrading their intelligent infrastructure. By integrating advanced technologies, hospitals can significantly elevate the standard of care, ensuring a smoother, more efficient, and patient-centric medical experience. Second, efforts should be made to optimize the operation interfaces of intelligent healthcare tools. This involves streamlining complex processes, making them more intuitive and user - friendly. Such improvements will not only enhance the usability of these tools but also boost their operational efficiency, enabling healthcare providers and patients to access and utilize services more effectively. Finally, it is essential to strengthen the promotion and application of basic intelligent healthcare services, especially in primary healthcare settings. Additionally, targeted intelligent healthcare convenience services should be developed for vulnerable groups, such as disabled and elderly patients. These specialized services can help bridge the digital divide, ensuring that all patients, regardless of their physical condition or age, can enjoy the benefits of intelligent healthcare technology.

1. Introduction

In recent years, the tension between doctors and patients has become the focus of public attention. Under the environment of rapid progress of big data, how to help balance the doctor-patient relationship through intelligent healthcare services has become the focus of medical development nowadays. In June 2019, the State Council issued an opinion on the Healthy China Initiative, proposing that the overall goal of the Healthy China Initiative is to deepen the reform of medicine, so that by 2030, the level of health literacy of the entire population will be greatly improved, people's health will be the center of attention, healthy lifestyles will be basically

popularized, and the main health influencing factors of the population will be under actual control. Under the coordinated promotion of the “Healthy China 2030” plan, the healthcare industry has undergone a transformation from traditional healthcare to digital and informationized healthcare, and is further moving towards a new stage of intelligent healthcare^[1]. The promotion and use of electronic medical records has greatly improved the qualification rate and quality of medical records, saving medical workers’ time and improving their business level. Doctors using cell phones, PDAs and other devices can pay attention to patients’ physical conditions at any time, monitor the collection of data, and assist in the diagnosis and treatment of diseases; nursing staff can also pay attention to the progress of the patients’ recovery dynamically, which can help to promote the recovery of patients with diabetes and other chronic illnesses and the improvement of their health conditions. With the steady development of intelligent healthcare in all platform regions, patients’ acceptance of new healthcare technologies is more passive, and the problem of patients’ difficulties in accessing healthcare remains severe^[2]. The doctor-patient relationship has long faced problems of information asymmetry and inefficiency, and focusing only on medical efficiency, effectiveness and efficiency is limiting. The emergence of big data technology provides strong support for the development of intelligent healthcare, and also provides new development opportunities for improving the doctor-patient relationship. In this paper, from the perspective of intelligent healthcare, we study the mechanism of the role of intelligent healthcare in improving doctor-patient relationship in the context of big data, and expect to put forward certain reference suggestions.

2. Combination of Intelligent Healthcare and Big Data

Intelligent healthcare is to realize the intelligent processing of medical information through the integration of IoT, big data, AI, 5G, cloud computing, Internet+ and other technologies, centering on patients, closely connecting medical institutions, medical staff, medical equipment, and ultimately realizing the intelligent and scientific construction of healthcare services, and jointly constructing an intelligent hospital system, a regional health system, and a family health system, to improve the quality and efficiency of healthcare services. Intelligent healthcare, as an important livelihood project in the strategic planning of intelligent cities, is not only related to the well-being of the people, but also a key engine for industrial upgrading and economic growth driven by the livelihood economy^[3]. The combination of intelligent healthcare and big data is used in a wide range of applications, one of which is senior care services. With the aging of China’s population, the status of senior care services in the healthcare reform is becoming increasingly prominent, and it has become a key challenge and core task in the reform process. Wang Xiaohui and Xiang Yunhua et al.^[4] Proposed telemedicine information system into the home intelligent healthcare system to realize the quality improvement of elderly care services. The second is the construction of intelligent hospital services, Wang Zhan and Li Shengnan^[5] believe that intelligent healthcare has far-reaching significance in the construction of hierarchical diagnosis and treatment, informationization platform and hospital management, assisting diagnosis and treatment for doctors, and the development of wearable devices, apps, and home-based intelligent systems for patients, which will benefit the people and build a harmonious society. Thirdly, for the construction of healthcare informationization, Cao Zhitong^[6] proposes to promote the construction of healthcare informationization through intelligent healthcare, and with its interoperability, healthcare synergy and patient-centeredness, it will continue to promote the process of healthcare reform, so that the majority of citizens and healthcare field personnel can get real benefits from it.

Intelligent healthcare as an emerging high-tech industry, its development currently there are many problems to be solved and explored. Intelligent healthcare is China’s current medical field is bound to develop a major trend, the level of development of intelligent healthcare directly affects

the degree of medical transformation in China, and healthcare services as an important assessment of the development of healthcare program is bound to directly affect the degree of development of intelligent healthcare. In the context of the general environment of insufficient investment and uneven distribution of medical resources, it is still difficult and expensive to see a doctor is the main medical status quo in China, intelligent healthcare can inject new power into these problems, alleviate the current predicament, and greatly promote the friendly and harmonious development of doctor-patient relationship. The enhancement of medical services requires the joint participation of patients in order to continuously improve the quality of patient experience is an important means to improve the quality of health care. Intelligent healthcare is developing rapidly, but it still needs to be improved continuously and strengthen the “top-level design”[7], and effectively solve the problem of difficult and expensive for patients to see the doctor.

3. The Mechanism of Intelligent Healthcare to Improve the Doctor-patient Relationship

With the rapid development of information technology, a considerable number of medical institutions have relied on information technology means and Internet tools to carry out useful explorations in improving patients’ experience of medical treatment and enhancing the friendliness of doctors and patients, and have achieved very obvious results. The popularization and promotion of intelligent healthcare has made the consultation process more convenient and the service more efficient. The mechanism of the role of intelligent healthcare in improving the doctor-patient relationship is specifically reflected in the following aspects.

3.1 Transparency of Medical Information

Patients can use the platform to access comprehensive information about their medical conditions, treatment plans, as well as their drug use and medication status. Misunderstandings and disputes caused by information asymmetry are reduced. This increased transparency of information helps to enhance patients’ trust, which in turn improves the doctor-patient relationship. For example, through the construction of a regional health information platform, the sharing of centralized electronic health records and regional medical images can be realized, and under this system, the interoperability and sharing of information among staff within hospitals can truly be realized. Doctors at the workstation are authorized to conveniently view the relevant examination data of patients in this hospital or other hospitals. When the doctor writes a new checklist, the system is able to intelligently identify and remind the doctor whether the patient has already undergone the same kind of examination, thus avoiding unnecessary duplication of examinations while ensuring medical safety. This not only reduces patients’ healthcare expenditures, but also saves time costs and improves the overall efficiency and quality of healthcare services.

3.2 Diversification of Communication Channels

Online counseling and remote diagnosis and treatment have made communication between doctors and patients more convenient and efficient. This has helped to reduce misunderstandings and conflicts caused by miscommunication. Intelligent communication helps doctors to better understand patients’ conditions and needs, improving the effectiveness of diagnosis and treatment, as well as helping patients to trust their doctors more, thus improving the doctor-patient relationship. Online consultation allows patients to get professional advice and guidance from doctors without having to go in person, while electronic medical records help doctors to understand the patient’s medical history and treatment more comprehensively and accurately, so as to provide more accurate treatment plans. The effective utilization of these functions helps to improve the communication

and interaction between doctors and patients, and enhance the trust between doctors and patients. The palm medical platform provides patients with health consultation, medical guide, registration, checking physical examination results, etc. It carries out online and offline interactive communication, realizes more flexible and diversified diagnostic and treatment services such as online recharging, booking of guided diagnosis, report query and doctor-patient communication, etc., which has greatly brought doctors and patients closer to each other.

3.3 Personalization of Medical Services

Intelligent healthcare can provide personalized healthcare services to meet the needs of different patients. This enhances patients' sense of access and satisfaction and helps improve the doctor-patient relationship. Setting up a one-stop service center for doctor-patient communication with eye-catching signs, nipping doctor-patient conflicts in the bud, constructing a satisfaction measurement system, and always adhering to the principle of patient-centered healthcare to promote the quality of healthcare services.

3.4 Efficient Medical Care Process

Intelligent healthcare revolutionizes the medical landscape by streamlining healthcare processes and enhancing efficiency, thereby significantly reducing patients' waiting times and healthcare costs. Through the implementation of online registration and online payment systems, it eliminates the need for patients to endure long queues, effectively shortening the waiting time for medical treatment. This not only boosts patients' willingness to seek medical care but also improves the utilization rate of medical services[8]. The efficient and convenient medical service model facilitated by intelligent healthcare plays a pivotal role in alleviating the strain on medical resources. By reducing patients' waiting times, it effectively mitigates patient dissatisfaction caused by prolonged waits, thereby decreasing the likelihood of doctor-patient conflicts. This harmonious interplay between technology and healthcare not only benefits patients but also contributes to a more sustainable and efficient medical ecosystem.

3.5 High Quality of Medical Resources

Building a remote consultation platform to promote the vertical flow of high-quality resources. The use of Internet technology innovations to implement county and rural medical associations and medical communities, and the sharing of quality resources between municipal hospitals and urban community health service centers, so that the quality medical resources of large hospitals can be effectively shared and sunk. In the main urban areas, community health service centers rely on municipal tertiary hospitals to build consultation centers and joint diagnosis and treatment centers to achieve timely and effective upward referral. The construction of a two-way referral platform enables two-way interaction of medical resources and gradually promotes the establishment of a graded diagnosis and treatment system.

4. Reflections on Development Issues

The development of intelligent healthcare has certain limitations for promoting the doctor-patient relationship, the uneven development of urban and rural areas, the limitations of the development of medical institutions, and the lack of quality supervision[9], which cannot well meet the residents' healthcare service needs. In addition, the progress and development of AI in the medical field cannot be separated from the support and promotion of big data, and the misuse or abuse of

algorithms in the process of data collection, preservation, transit and utilization can lead to medical malpractice and ethical issues[10]. It should accelerate the sinking of resources, optimize resource allocation, establish a scientific and reasonable diagnostic and treatment process, and further enhance the service capacity of primary health-care institutions; it must adhere to and continually improve the system of hierarchical diagnosis and treatment, and continually narrow the gap between the development of urban and rural health-care institutions; More patients with health insurance are more satisfied with the quality of health care services. From a positive perspective, broader health insurance coverage promotes patient satisfaction with the quality of health care services, and in addition, the lower the cost of health insurance, the higher the patient satisfaction with health care; The poorer the health condition and the more frequent the visits to the doctor, the slightly more satisfied with the perceived quality of healthcare services, which may be due to the fact that such residents have more exposure to intelligent healthcare services and have more comprehensive feelings, which should be increased to publicize intelligent healthcare, as well as to improve the technology and service level of intelligent healthcare; It should also focus on patient privacy and security, and strengthen the ethical management of intelligent healthcare and the security of information leakage issues.

The development of intelligent healthcare greatly improves the quality of people's access to healthcare and improves the quality of personal life. The current popularization of artificial intelligence (AI) and robotics in the field of intelligent healthcare has brought more significant diagnostic and treatment effects and promoted significant changes in the medical field, but the ensuing problems should be solved even if they are to be solved, and the supervision and management system should be improved[11]. Therefore, patients' willingness and motivation for the development of intelligent healthcare can be improved by widely publicizing and popularizing the use of intelligent healthcare, improving the quality of hospital services, and standardizing medical services. The quality of healthcare services is the main factor affecting patient satisfaction; the higher the quality of healthcare services, the more satisfied residents are with the development of intelligent healthcare, and the more willing they are to carry out consultations.

Hospitals are institutions that serve patients, and putting people at the center is the core of medical development. The essence of humanistic care lies in respecting individual freedom, advocating equal rights, attaching importance to people's rational analysis and judgment abilities, paying attention to people's inner worlds, and pursuing spiritual satisfaction. Tension between doctors and patients is a prominent factor affecting social harmony. The intelligent development of hospitals at all levels should be accelerated, the intelligent management of hospitals should be strengthened, humanistic care education should be strengthened from school onwards, the doctor-patient relationship should be improved, the fairness of patients' access to healthcare resources should be promoted, a scientific and effective resource management model should be established, and the mechanism of the process of optimizing patients' access to healthcare should be perfected and optimized, so as to ultimately comprehensively improve the quality of intelligent healthcare services. In the context of big data, intelligent healthcare effectively improves the doctor-patient relationship through a variety of mechanisms such as information transparency, broadened communication channels, personalized services and improved medical efficiency. In the future, with the further development of intelligent healthcare, it is believed that the doctor-patient relationship will be further improved and optimized.

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