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Research on the Development Path of Online Referral based on the Background of Smart Medicine

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Abstract

Smart medical treatment is an important direction of the development of medical informatization in China in the new era. On the basis of studying the current development level of medical informatization in China, this paper summarizes the problems and challenges faced in the current development of smart medicine in China, focuses on the current situation of referral under the hierarchical diagnosis and treatment system in China, and scientifically analyzes the problems of complicated procedures and difficult transfer to the referral mode under the qualification line. This paper expounds the necessity and importance of building an online referral model, discusses the core essence, content system and its development and innovation, and expounds the contemporary value and significance of building an online referral model. The innovative path of building the online referral mode is put forward from the aspects of economic development conditions, technological development conditions, objective conditions of national policy support conditions, public feedback conditions and subjective conditions of social development conditions.

Keywords

Smart Medical Treatment; Online Referral Model; Objective Conditions; Subjective Conditions; Path Research.

1. Evolution of Chinese Transfer Measures and Their Challenges

1.1. Evolution and Trend of Referral Measures in China

Hospital informatization construction has always been a hot issue continuously discussed. In 2001, someone proposed that the design of medical insurance information system should adopt the "browser-application server-database" mode, etc., 2001)（[1]It has formulated a basic framework for the medical informatization construction in China. The informatization construction of hospitals can be roughly divided into three aspects, namely the informatization of medical files (Bao Yuting et al., 2021)[2], Chronic Disease Remote Health Monitoring Xing Dan et al., 2019)（[3]And intelligent guidance (Quan et al., 2020)[4]. In recent years, smart cloud and big data platforms have developed rapidly, Wang Chenyu et al., 2022)（[5], Internet health care is booming. People are more willing to accept new things, and they have high expectations for the realization of the efficient and convenient online transfer mode.

So this team put forward the research, can develop a new type of referral way, do the following purpose: if you can based on the health big data, provide value medical services, reengineering traditional medical treatment, combined with intelligent recommendation, help patients to extend the industrial chain, relying on the Yangtze river delta region green Internet medical integration development platform, realize hierarchical diagnosis and treatment, relieve the pressure of "siphon", boost the rational allocation of Yangtze river delta region medical

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resources. Through the joint efforts of multiple subjects, combined with advantages and opportunities, to help the realization of the efficient and convenient "Internet + medical" mode.

1.2. Problems and Challenges Faced by Online Hospital Transfer in the New Era

Building an online transfer platform must be an important part of the hospital information construction. At the same time, building this platform is not easy, and there are many problems and challenges. As the core problem is that the support must have matching technology in the construction process. There are also dizzying discussions on how to achieve smart healthcare technology, such as server virtualization technology Xu Yan, 2022)([6], Fog calculation (Xing Dan et al., 2019)[7]wait a minute.

In the "Solving the Difficulties of Medical Insurance Transfer with Economic Leverage" (Wang Guoping, 2019), it is also mentioned that the existing medical insurance fee control policies make lower hospitals unwilling to release people, and the family members of the disease make the family members want to transfer to the hospital but think they have not met the conditions for hospital transfer[8]. Research on Hospital Cost Accounting Management Problems and Countermeasures (Lin Qingyun, 2021)[9]It is pointed out that some hospitals have some financial management problems at this stage. According to the survey, most patients in hospitals at all levels rely on doctor recommendation or acquaintances, there is a waste of time and energy. The uneven distribution of medical resources caused by the uneven level of economic development has long been present in Wang Juan, 2018()[10], Due to the complicated transfer process, complicated procedures, inconsistent remote medical treatment, disorderly medical treatment and other problems have brought a lot of inconvenience to the transfer of hospital patients, Liu Yang, 2019()[11]

On the other hand, patients have very limited ways for them to understand the superior hospitals suitable for their own treatment. They mainly rely on the recommendation of acquaintances or online search, and it is difficult to find a systematic platform to find the most suitable superior hospitals for their own. On the other hand, there are significant information barriers between higher and lower levels of hospitals, and the serious lack of information exchange between higher and lower levels leads to the imbalance of medical structure and the waste of medical resources. In addition, the referral procedures for treatment are very cumbersome. The patient's completed examination results in the lower hospital may not be approved by the hospital after being transferred to the higher hospital, and the patient is required to check again. This is both a waste of medical resources and the financial burden of patients.

It is hoped to use the current advanced information technology to build a platform for communication between patients, lower hospitals and higher hospitals, so as to help more patients no longer rush around for the problem of hospital transfer.

2. Basic Content of Online Referral

2.1. The Core Essence and Content System of Online Referral

Online referrals are in line with the CPC Central Committee's suggestions on the 14th Five-Year Plan to bring people's livelihood to a new level and improve the health system. And in line with the General Office of the State issued the "deepening of the Reform of the Medical and health system in 2022, the key tasks" issued in the notice to continuously promote hierarchical diagnosis and treatment and optimize the arrangement of medical treatment order. In the context of COVID-19, in the process of vigorously promoting the construction of "smart medical care", with the goal of solving the problem of "difficult hospital transfer", we will actively explore ways to solve this difficult problem, and finally realize the transfer of patients under the epidemic prevention and control, and obtain certain social benefits. The core essence of

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online referral is to "benefit patients, hospitals and society", which is not limited to solving the problems encountered by one party in the referral process, but also to take into account the three parties, make overall planning, so that patients, hospitals and society can benefit, and realize the same personal benefits and social benefits. Focus on solving the problems of uneven distribution of medical resources, inconsistent medical treatment, disorderly medical treatment, information barriers between hospitals, and complicated transfer procedures. Figure 1), to truly provide patients with more convenient online referral methods for patients, reduce the burden of hospitals, respond to the call of the state, and achieve social benefits.

The content system of online referral is as follows: the first step is to convey all patients' conditions and related materials to the hospital; the second step is to transfer the application from the lower hospital to the superior hospital; after the third step passes and the hospital agrees to make the transfer application, the patient can submit the electronic medical record for transfer.

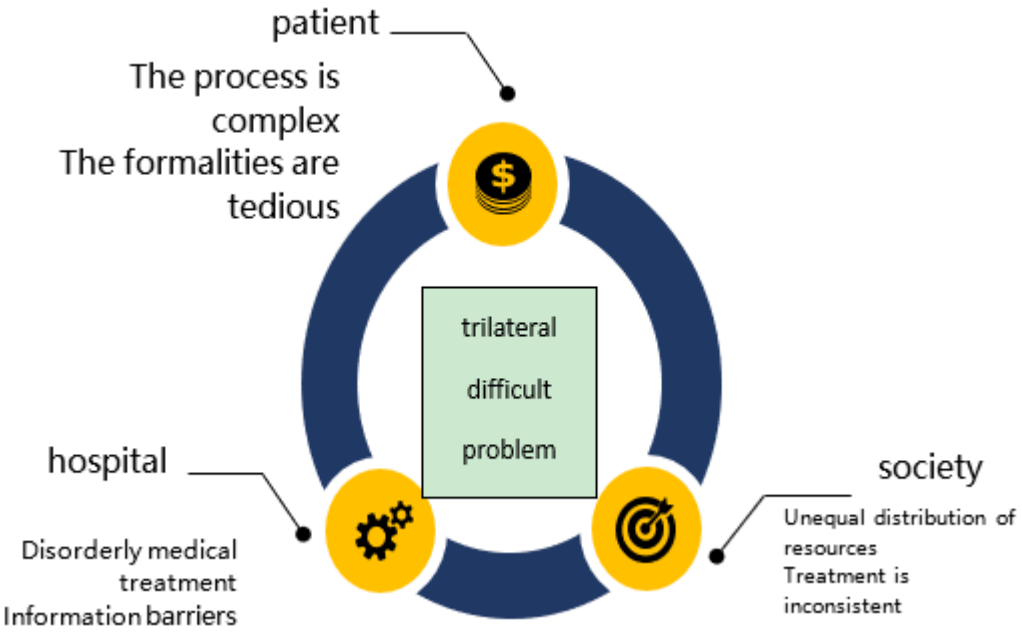


Fig 1. Trilateral difficult problem

2.2. Development and Innovation of Smart Medicine Treatment by Online Referral

With the integrated development of the Yangtze River Delta, medical services are gradually becoming intelligent, and smart medical care has become the focus and hot field of livelihood projects. Under the call of the "Healthy China Policy", and relying on the intelligent construction of big data and mobile cloud platforms, the Internet medical care is in the ascendant. Under the COVID-19 epidemic prevention and control situation, a sharp rise in online diagnosis and treatment demand has occurred. So establish matching service facilities is an important problem to be solved, how to do a good job of patients under the epidemic prevention and control, let patients enjoy more quality medical services, to provide more scientific and reasonable medical resources is also a difficulty and how to do epidemic prevention and control of patients, transfer, such as medical needs, promote the rational allocation of medical resources, these are online referral problems in the process of wisdom medical development. Online referral also plays an innovative role in the development of smart medical treatment. Online referral follows the trend of "Internet +", combines the Internet with medical referral, effectively promotes the facilitation of medical diagnosis and treatment, improves the current medical level and expands the scale of online medical treatment to a certain extent.

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3. Difficulties and Practical Difficulties of Offline Referral on the Epidemic Background

3.1. Problems with Online Referral Information Sharing

It is of great significance for the medical industry to deeply explore and use the sleeping massive data. However, at present, China's medical big data is still a blue ocean, facing technical and policy obstacles. There are some problems such as low degree of data sharing, low data utilization efficiency and inadequate technology. The first reason is affected by the imbalance between medical data demand and patient privacy protection. For patients, personal medical information is the privacy that patients do not want to disclose to the outside world, and medical institutions also have the obligation to protect the privacy of patients. If an online referral model is built, patients are not willing to easily disclose their personal medical treatment information to the online platform, and medical institutions are not willing to share their patients' personal information. Second, it is affected by the uneven distribution of interests in various medical institutions. At present in the development of medical career medical data sharing mechanism is not sound, for patients, hospitals and data users of the lack of effective management of benefit distribution, data ownership and data users is not clear, the stakeholders to pursue their best interests are not willing to share medical information, caused the data sharing and efficiency lack of driving force. Third, the impact of the collection and utilization of effective information is not in place. In order to build an online referral model, there are problems of inaccurate patient information collection, ineffective information collection, effective information collection and low efficiency of information utilization. The goal is to make use of medical data provided by patients efficiently and seek more benefits for patients. In view of these problems, in the process of building the online transfer mode, on the one hand, the risk of data sharing revealing patient privacy should be considered; on the other hand, the interests of all parties should be allocated in the application of medical data to break the information barriers between medical institutions. For the efficient use of medical data, we can truly "awaken" the sleeping medical data by establishing an efficient data governance system and developing data information security utilization technology.

3.2. There are Difficulties in the Cooperation with Major Hospitals in the Early Stage of Online Referral

First, In the early days of the platform, as it is a new online referral treatment platform and requires more private patient identity information and body data, the leak will have a huge impact on both the hospital and the patient itself. Major hospitals will certainly feel unfamiliar and have some concerns about the security and confidentiality of the platform, and they are not necessarily willing to reach cooperation with us.

Second, Since our platform is an online platform and relies on the Internet for operation, it will inevitably cause virus invasion, which will cause losses to the platform to some extent. The consequences of a data breach will be unimaginable.

Third, As college students entrepreneurial groups, we have not yet fully achieve economic independence, and this is our first time for independent entrepreneurship, out of credibility and reliability, we reach for the hospital profit possibility is lower compared with large enterprises, and there are certain capital chain fracture and information leakage risk, the hospital may not be willing to cooperate with us. To sum up, hospitals may not be highly tolerant or even reject the platform.

3.3. Problems in the Construction of an Online Referral Service System

First, the referral system was not clear enough. In terms of the current referral system, this system is not very clear, lack, less certain restriction mechanism in the line of the whole society,

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the process of referral system, remove some specific referral standard is difficult to determine, referral procedure is not clear and channel has not been a large unobstructed, more important is local protectionism, some hospitals only consider their own economic interests, the lack of feasible work plan and effective restriction mechanism.

Second, Public perception urgently needs to be changed urgently. Because people generally "only go to big hospital", "doctor only experts", the psychological led to part of the hospital neglected, few referral patients, so bed vacancy, idle machine, medical resources waste phenomenon is serious, and "big hospital", such as tertiary hospital, overcrowded every day, experts most of the time in see common disease, frequently occurring, and part of the common disease, frequently-occurring actually in the secondary hospital, and even the community health center can be effectively solved, it also makes the limited medical and health resources not fully reasonable use. Therefore, patients should choose the appropriate hospital according to their own conditions, rather than blindly transfer to some hospitals. In this way, primary, secondary medical effective work, will be able to reduce the tertiary class hospital outpatient service and bed turnover pressure, can make the big hospital experts and professors will focus on serious diagnosis and treatment and research, make the utilization rate of medical and health resources get more effective, more reasonable improvement, and strengthen the cooperation between hospitals at all levels did not get full and reasonable use.

4. Online Referral Innovation Path based on Smart Medicine

4.1. Innovation in the Research Perspective based on the Online Referral of Smart Medicine

Conveniencelow, Available for selectivitylowThrough literature studies, questionnaires and visiting medical workers, we found that cumbersome transfer procedures are a common problem. Under normal circumstances, the transfer of the hospital is not the hospital, how to choose the most appropriate hospital is very important. Past mainly from two angles to solve this problem, one is from the perspective of higher and lower hospitals, patients to the current hospital request, by the hospital according to the patient's condition recommend the appropriate hospital and complete the transfer application process, the second is from the perspective of the patient's family themselves, the patient's family adopts the way of independent choice, or acquaintances recommended or their own experience to choose more appropriate hospital transfer. Such a current situation leads to the low popularity and convenience of hospital transfer. Based on the realistic basis and the later analysis of the questionnaire survey data, we found that there are many uneven medical resources, and it is difficult to completely distinguish the priorities of medical treatment. Based on this basis, we study from a two-way perspective, break the original inherent thinking, new perspective, new start

4.2. Research Method Innovation based on Smart Medical Online Referral

This project team changed the previous single research method model, and organically combined multiple research methods to obtain the results. One is that, through the social investigation law, The team found that although China has promoted the construction of a hierarchical diagnosis and treatment system as early as 2015, However, there is still the phenomenon that patients blindly choose large hospitals under the condition of serious illness, Cause the imbalance in medical treatment, This phenomenon has attracted the attention of our team; The second is the questionnaire survey method, A random survey of various social groups in the form of a questionnaire, The survey found that the public's satisfaction with the hospital information construction was not satisfactory, in other words, The further construction of smart medical treatment is imminent; The third is the field interview method, Through face-to-

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face visits to medical staff, we learned that patients' families often deal with the problem of hospital transfer. Then, using the literature research method, consulting a large number of literature also found that the current level of medical information construction urgently needs to be improved, the current situation of low work efficiency and poor medical quality control needs to be improved, and then found through the inquiry of Pull) and SMS Push) methods can be further explored in this project. At the same time, the deductive reasoning method is used to promote the birth of the hypothetical research path and a series of subsequent practical operations to infer the feasibility of the conclusion, so that the results on the basis of science are more moderate and reliable. On the basis of investigation and literature review, the hypothesis is proposed on the intelligent construction process of hospital transfer, which proves the implementation of the research path. Multiple research methods complement each other and organically realize the study of this path.

4.3. Theoretical Innovation based on the Online Referral of Smart Medical Care

The development of China's medical industry is mainly divided into three stages, and now the third stage is the stage of medical information network promotion and service. At present, our team has learned that the "Internet + medical" services provided on the market mainly include medical consultation, disease inquiry and other functions, mainly meet the daily consultation service, and cannot fundamentally meet the medical needs of patients in the transfer; and the profitability of enterprises makes patients easy to consume in the process of medical treatment. No one is considering moving the cumbersome transfer system to the line. First, the online referral research path is based on ideological innovation, and it is committed to transferring the more cumbersome offline transfer system to online, overcoming the spatial distance obstacle, and the purpose is to make the transfer process more simple and convenient. Second, patients often face do not know how to choose the suitable hospital problem, and blind to the big hospital, causing medical structure imbalance and waste of medical resources, the study hope that patients can use online referral is a powerful tool for further referral, to avoid the unreasonable use of medical resources.

5. Conclusion

Since the 1980s, China has been continuously developing the Internet medical treatment, and China's medical informatization cause has made remarkable achievements. From a single machine and local system to an integrated information system, from the era of handwritten cases to the era of electronic medical records, from the development direction of improving medical efficiency to the development direction of improving patients' medical experience. China constantly adjust the contradiction between real needs and resources, and improve the development level of medical informatization. With the rapid change of science and technology, the development of smart medical treatment has become the top priority in the development of medical undertakings in China. In the face of the complicated referral procedures and difficult referral problems existing in the current offline referral mode, the establishment of the online referral mode is of great significance for the continuous in-depth exploration of "Internet + medical treatment", the better implementation of the hierarchical diagnosis and treatment system, to meet the practical needs of the masses for medical treatment, and to improve the level of medical information service. Therefore, the feasibility of the development of online referral model is studied, and the development of online referral model from the analysis of economy, technology, policy, masses, society has great prospects. Economically, the digital economy gives great support to the online medical industry, boosting the development and upgrading of China's medical industry to the direction of informatization and wisdom. Technically, information technology continues to progress to realize medical data sharing. In terms of policy, the unified electronic medical record system has facilitated the development of

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the online referral model. On the masses, most of the public feedback of the people in building the online referral mode gives great support and affirmation to the construction of the online referral mode. In society, China's Internet medical development has a long history, which provides a solid foundation for the development of online referral model. The construction of online referral mode will certainly be an inevitable trend of social development.

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