



How to Develop Future Internet Medical Care? : A Case Study of China

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Abstract

Purpose – With the increasing medical demands of the public, the development of future Internet medical care has come to represent a major problem. Therefore, the purpose of this study is to discuss future development strategies for Internet medical care while taking China's Internet hospitals as an example case.

Research design, data, and methodology – This study conducted a case study of China's Internet hospitals to summarize the fundamental problems faced by Internet hospitals and propose future development strategies to overcome these problems for Internet medical care.

Result – Although Internet hospitals have been regarded as the ultimate product of Internet medical care, from the perspective of the government, medical institutions, platform builders and maintainers, and patients, they still face some basic issues.

Conclusion – This study concludes that the government and medical institutions play an important role in the future development of Internet medical care and suggests that the government should make overall plans for the policies and standards and should play the main role in enhancing the public trust in Internet medical care, while medical institutions should take steps such as seizing policy opportunities, driving online and offline collaborations, and constructing suitable evaluation systems to promote the development of Internet medical care.

Keywords: Internet Medical Care, Internet Hospital, Telemedicine, Online Healthcare, China

JEL Classification Code: M10, M20, M38

1. Introduction

With the continuous penetration and application of information technology in the medical service field, Internet medical care has gradually developed into an emerging industry involving a wide variety of medical services that use electronic information technology as a means and the Internet as a carrier to carry out online health education, electronic health records, medical information inquiry, disease risk assessment, electronic prescription, and transmission, as well as telemedicine and telerehabilitation. Due to the openness and convenience, Internet medical care enables the continuous optimization and efficient use of existing medical resources and provides patients with more diversified ways of accessing medical care and personalized medical services as well, thus improving their satisfaction with medical services further. However, the recent Internet medical services mainly focus on businesses such as appointment registration and health consultation. To make breakthroughs, the core contents of Internet medical care must be developed.

In recent years, the Chinese government has introduced a series of policies and regulations to promote the development of Internet medical care. In the context of the national strategy of “Internet+”, Internet giants (e.g., Ali, Tencent, Baidu, Xiaomi, etc.), capital markets (e.g., Ping An Insurance (Group) Company of China, Ltd, Union Pay, etc.), entrepreneurs (e.g., mobile Apps Chunyun Doctor, We Doctor Group, Ltd, etc.), and pharmaceutical companies have gradually formed a complete Internet medical industry chain (Zhu, 2016). During COVID-19, the Internet medical industry has ushered in multiple policy dividends, which further compensate for the previously existing policy shortcomings. The sudden outbreak of COVID-19 has substantially changed people’s medical habits, making them become familiar with and accept Internet medical services. “The ‘Internet + Medicine’ Utility Report in the Context of COVID-19” released in 2020 showed that, solely from January 23 to 31, 2020, the Internet medicine center of Taizhou hospital provided online consultations for 5,351 cases, teleconsultations with primary health centers for six cases, follow-up consultations with 5,307 person-time, and 18,749 person-time served in total (CN-Healthcare, 2020).

The promotion of government policies and the increase in the demand for online medical treatment from patients have significantly promoted the development of Internet medical care. However, a questionnaire survey among outpatients in public hospitals in Shanghai found that only 18.57% of the respondents were very familiar with Internet medical services, and the contents of the Internet medical services chosen by the public mainly focused on appointment registration, online consultation services, online report viewing, and online medication dispensing, etc., which rarely involved the core businesses of medical services (Jiao & Yu, 2021). Policy dividends, practical experiences, and changes in public’s medical habits during the COVID-19 outbreak in China have extensively driven the enthusiasm for the construction of Internet medical services and brought new opportunities for their development, but it is essential to make full use of the role of hospitals and to regulate Internet medical platforms built by hospitals to solve the development dilemma of Internet medical care.

China’s Internet medical care has transformed from the 1.0 era of the PC Internet to the 2.0 era of the mobile Internet and is now in the transition period from 2.0 to 3.0, that is, toward the 3.0 phase with “Internet hospitals” as the transformation direction. Internet hospitals, which are the “ultimate products” of China’s Internet medical care, refer to “closed-loop” telemedicine services from online to offline and from the front to the back end for patients based on the medical resources owned by traditional hospitals (Gu et al., 2017). Following the initial trial of Internet hospitals in Wuzhen, Zhejiang Province, in 2015, Internet hospitals have developed rapidly in China. As of December 31, 2020, 1,004 Internet hospitals have been built in China (iimedia Research, 2021). Internet hospitals, which are one of the bearer forms of China’s Internet medical care, have been favored by the industry for sustainable development. Hence, this paper aims to examine China’s Internet hospitals as an example case to study and discuss future development strategies for Internet medical care.

2. Theoretical Background

To standardize the management of Internet medical services in China, the National Health Commission and State Administration of Traditional Chinese Medicine issued three documents in 2018, including *Management of Internet Hospitals (trial)*, in which an Internet hospital was clearly defined as the second name for medical institutions and those that are independently set up while relying on medical institutions.

Internet hospitals, which are the ultimate product of “Internet + Medicine”, emphasize patient-centered medical and health services. Through interfacing with the internal information system and cross-regional information platform, Internet hospitals can provide services including pre-visit appointment registration, examination and test appointments, intelligent triage guidance, etc.; mid-visit online reviews, teleconsultations, access to health records, online

prescriptions, online payments, etc.; post-visit case copy distribution, pharmacy service and drug distribution, chronic disease management, health tracking service, etc. Using mobile intelligent terminal devices, users can complete the whole process of pre-consultation, consultation, and post-consultation in a one-stop medical consultation through Internet hospitals (iimedia Research, 2021). As the effective complement to the medical model of hospitals, Internet hospitals have changed the traditional medical location for patients especially those with chronic diseases and extended medical services from “in-hospital” to “out-of-hospital”, thus breaking through the traditional limitations of time and space. While improving patients’ medical experiences, they also enhance the accessibility of health services, which not only reflects the concept of patient-centered medical and health services, but also effectively alleviates the contradiction between the supply and demand of medical resources (Han, Lie & Guo, 2020). Moreover, compared to telemedicine or general Internet medical services, the most significant advantage of Internet hospitals is to employ physicians both in their institutions and in other medical institutions to carry out Internet diagnosis and treatment activities, such that physicians can invite other physicians for consultations through Internet hospitals wherein they can directly issue diagnoses and prescriptions (The National Health Commission & the State Administration of Traditional Chinese Medicine, 2018).

3. Case Study

This paper takes China’s Internet hospitals as an example case and discusses their development environment to provide suggestions for future strategies of Internet medical care.

3.1. Current Status of Internet Hospitals in China

3.1.1. Construction Scale

Internet hospitals have emerged and been vigorously developed in China. <Fig. 1> shows the number of Internet hospitals built in China from 2014 to 2020, and we can see that China has built a total of 1,004 Internet hospitals as of December 31, 2020. At present, the number of Internet hospitals in China has exceeded 1,700.

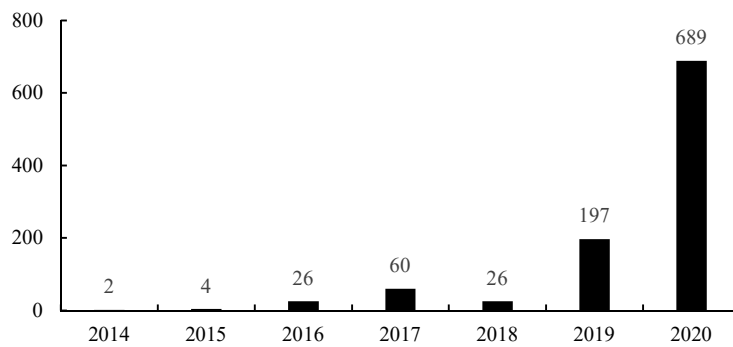


Figure 1: Number of Internet hospitals built in China from 2014 to 2020

Note: Reprinted from “2021 China e-hospital development report (p.9)”, by National Telemedicine and Connected HealthCare Center & CN-Healthcare (2021). The number of built Internet hospitals refer to Internet hospitals that have received Internet hospital licenses, and the statistics are as of December 31, 2020.

3.1.2. Operation Mode

The main operation modes of the existing Internet hospitals in China can be simply classified into three categories (as shown in <Table1>). The first category is initiated by the local government to achieve a unified standard for regional population health management as the primary objective, such as the Zhejiang Internet Hospital. The second category takes hospitals as the main body to transfer the diagnosis and treatment services offline to online through self-built network platforms or enterprises, such as the Internet Hospital of the First Affiliated Hospital of Zhejiang University and the Internet Hospital of Shenzhen Baoan Hospital of Traditional Chinese Medicine. The third category consists of those that are mainly initiated by enterprises that do not rely on any hospitals to connect patients with

practicing physicians online. For example, depending on the existing resources of more than 140,000 doctors of Good Doctor Online, the Yinchuan Smart Internet Hospital has been jointly established by Good Doctor Online and the Yinchuan Government (Han, Lie & Guo, 2020).

In terms of operating entities, there are significant differences in the three existing operation modes of Internet hospitals, but they all form cross-regional collaborative activities between experts and primary care physicians because they rely on medical institutions or self-built medical resources. The diversity of operating models has substantially increased the enthusiasm of governments, hospitals, and enterprises to build Internet hospitals. Medical institutions have become a mainstay of Internet hospital construction. This is because, with the implementation of relevant policies since 2018, the third operation model initiated by enterprises has needed to rely on medical institutions.

Table 1: Operation modes of Internet hospitals in China

	Government-led Internet Hospitals	Hospital-led Internet Hospitals	Enterprise-led Internet Hospitals
Operators	Local government	Hospital	Enterprise
Purpose of construction	Build Internet medical platform at administrative level	Transfer offline services to online	Invest in construction for profit
Role of relevant parties	Local hospital serves as a builder to establish the online hospital districts in local medical institutions; Enterprise serves as a contractor to provide technical and medical resources support.	Government serves as the director to responsible for examination, approval, and supervision; Enterprise serves as a contractor to provide technical support.	Government serves as the director to responsible for examination, approval, and supervision.
Physician sources	Physicians registered in the Internet medical platform and physicians from regional medical institutions.	Physicians belonging to the hospital.	Multipoint practicing physicians.
Users	Patients in administrative areas	Patients who choose to be treated at this hospital	Internet patients

Note: Adapted from “The Internet hospital as a telehealth model in China: systematic search and content analysis,” by Han, Y., Lie, R. K. & Guo, R. (2020), *Journal of medical internet research*, 22(7), e17995. p.3.

3.1.3. Business Contents

As national policies continue to be gradually clarified, Internet hospitals have been clearly positioned as new medical institutions. The business contents of Internet hospitals can be roughly divided into three categories: Convenience services, which mainly include appointment registration, report inquiry, online payment, hospital navigation, drug delivery, etc.; noncore medical services, such as medical consultation, scientific research follow-up, health consultation, etc.; and core medical services, including follow-up visits for some common diseases and chronic diseases, “Internet +” family doctor contract service, teleconsultation, chronic disease management, etc. Among these business contents, appointment registration, online payment, report inquiry in convenience services along with medical consultation in non-core medical services currently comprise the most used services of Internet hospitals in China. Further, follow-up visits for common diseases and chronic diseases for core medical services also account for more than 80% of business, but the penetration rate of the “Internet +” family doctor contracting service only accounts for 30% of the total (National Telemedicine and Connected HealthCare Center & CN-Healthcare, 2021), indicating that although Internet hospitals have indeed developed rapidly in China, the real value of Internet hospitals has not yet been realized, and the core businesses around disease diagnosis and treatment still have to be developed.

3.2. Development Background of Internet Hospitals in China

3.2.1. Strong Support from Internet Medical Care-Related Policies

The development of Internet medical care in China has been closely related to policies. Internet medical care policies have gone through four phases: the exploration period, development period, cold period, and standardization period (Ge, Zhao & Han, 2021): (1) The policy exploration period (1999-2013): during this period, China began to focus on telemedicine, but it only involved establishing websites and providing services such as medical and health information consultation. The development of telemedicine laid the foundation as the “predecessor” of Internet medical care; (2) The policy development period (2014-2015): with the continuous development of medical demands and Internet technology, China began to pay increased attention to the application of Internet technology to reform medical systems, encouraged the establishment of medical network information platforms, and promoted the combination of medical services and “Internet +” to create closed loops of online and offline medical care; (3) The policy cold period (2016-2017): due to the severe homogenization of the industry, the lack of innovative breakthroughs in the online consultation, and the inability to match the industrial model with user demands, it was hard to release the market potential, as invested capital gradually became more rational, and the national policy support gradually became lower; (4) The policy regulation period (2018 to present): with the intensive introduction of Internet medical care-related policies from top-level design to specific rules and implementation opinions, the industry status of Internet medical care has gradually been established. Particularly during COVID-19, the Internet medical industry has ushered in multiple policy bonuses, thereby further compensating for the previously existing policy shortcomings. The Internet medical care policies in China introduced in recent years are listed in < Table 2 >.

Table 2: Internet medical-related policies in China

Government agencies	Policy	Measure
The General Office of the State Council (2018)	Opinions on promoting the development of “Internet + medical health”	Allowed the development of Internet hospitals relying on medical institutions. Allowed for common and chronic diseases to be re-diagnosed through the Internet, and for doctors to issue prescriptions online after mastering the medical records.
The National Health Commission and the State Administration of Traditional Chinese Medicine (2018)	The issuance of three documents, including the Internet medical treatment management measures (trial)	Standardized the access and supervision of new forms of Internet medical services.
The National Healthcare Security Administration (2019)	Guiding opinions on improving “Internet+” medical service prices and medical insurance payment policies	Put forth specific requirements for project price management and medical insurance payment of “Internet+” medical services.
The State Department of the CPC Central Committee (2020)	Opinions on deepening the reform of the medical security system	Included qualified medical institutions in the scope of medical insurance agreement management.
The National Healthcare Security Administration and the National Health Commission (2020)	Guiding opinions on promoting the development of “Internet +” medical insurance services during the prevention and control of the COVID-19	Clarified the rights of Internet medical institutions to issue electronic prescriptions, flexibly dispense drugs offline for patients, enjoy medical insurance payment benefits for insured persons, etc.

Note: The summaries in this table have been prepared by the authors.

3.2.2. Alleviate the Shortage and Misallocation of Medical Resources

In China, the difficulties involved in accessing medical care have always been criticized by the public. Despite that the Chinese government has committed to improving the uneven distribution of health resources between urban and rural areas (Yip & Hsiao, 2014), the siphoning of medical resources by large hospitals has not been effectively addressed. According to the *China Health Care Statistics Yearbook* published by the National Health Care Commission in 2021, the number of visits to tertiary hospitals was about 1.8 billion (1,798.245 million), accounting for about 54% of the total number of hospital visits. Still, there were only 2,996 tertiary hospitals, accounting for about 8.5% of the total number of hospitals, that is, 8.5% of tertiary hospitals provided about 54% of diagnosis and treatment services (China Health Care Statistics Yearbook 2021, p.10, p.124). It is difficult to solve problems with the shortage

and misallocation of medical resources in the short term by achieving an absolute increase in resources, particularly human resources.

Instead, Internet hospitals break through the medical radiation radius of traditional hospitals through technical means, improve the degree of matching and efficiency of existing medical resources, connect scattered medical resources to save medical costs, and increase the average number of daily visits by physicians in primary health care institutions. Meanwhile, through online diagnosis and treatment, patients with common and chronic diseases from large hospitals are reasonably diverted to the primary hospitals to a large extent, which weakens the siphoning effect of large hospitals and improves the utilization rate of primary medical resources, ultimately helping alleviate the problems of resource shortage and unreasonable allocation.

3.2.3. Improve Service Flexibility and Convenience for Patients

Patients seeking medical treatment in China have experienced a phenomenon of “three longs and one short” (namely, a long registration time, a long waiting time, a long time to pick up medicine, and a short time for medical treatment). The introduction of Internet medical care particularly the development of Internet hospitals has largely helped the optimization of medical procedures. Take the Internet hospital of the First Affiliated Hospital of Zhejiang University as an example. Its online consultation room provides services from 8:00 to 12:00 and 13:30 to 17:00 daily. After a successful reservation, the Internet hospital will provide a serial number of the visit, and the doctor will initiate the video in order. At the same time, the patients only need to be ready for the video after receiving the SMS notification. After consultation, patients can pick up their medication either through “hospital pickup” or “online delivery”. “Pharmacy pickup” will also be gradually supported in the future. Therefore, Internet hospitals have been seen as important measures to significantly simplify medical procedures, particularly for chronic disease patients, and fully meet their demands of online services without leaving home, one-click appointments for examination and test services, drugs delivery across the country, regular follow-ups and reviews, and convenient payments.

3.2.4. Full Utilization of High-Quality Physician Resources

The existing policy stipulates that Internet hospitals can use both physicians registered in their institution and those registered in other medical institutions to carry out Internet treatment activities, which, on the one hand, helps doctors use the fragmented time to obtain the corresponding remuneration by providing online medical services, and on the other hand, helps doctors “de-unitize” and promote the free practice of “good doctors”. Besides, doctors also build upon their brand and reputation by strengthening communication and exchanges between doctors and patients. Therefore, quality physician resources have been fully utilized to a large extent.

3.3. Prospects for the Development of Internet Hospitals in China

From the technical level, Internet hospitals will gradually break through the traditional medical ecosystems in the future and develop toward the realization of the entire medical procedures and closed-loop management. <Fig. 2> presents the collaborative integration of online and offline in-hospital and out-of-hospital businesses based on Internet hospitals. Moreover, the recent development of Internet hospitals has substantially driven the development of smart hospitals. The health systems will adopt smarter digital technologies for safer and streamlined care in the future, thus allowing medical professionals to spend more time on patients, such as by using technologies like face recognition, fingerprint recognition, and iris recognition to identify personnel in online diagnosis and treatment; using humanized intelligent guidance systems based on speech recognition from the medical knowledge base for precise classification; using wearable monitoring of patient data automatically uploaded to the network to monitor patient conditions in real time; and automatic diagnosis of patients based on disease diagnosis models with treatment advice. In the future, it is entirely possible that AI will replace physicians for some common and non-complex diseases and will serve as regular “doctors” in Internet hospitals.

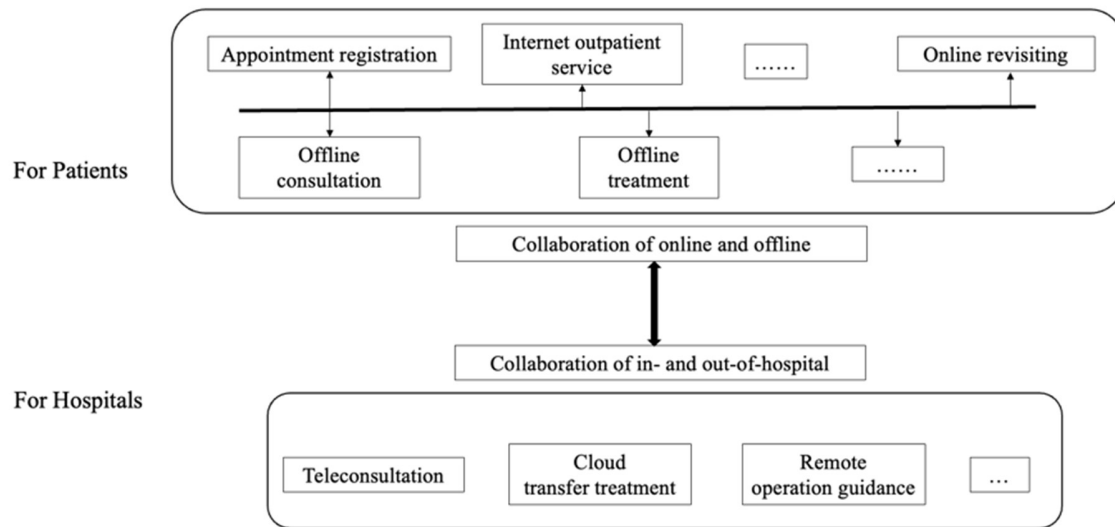


Figure 2: Collaborative integration of online and offline in-hospital and out-of-hospital services

Note: Adapted from “2021 China e-hospital development report (p.18)”, by National Telemedicine and Connected HealthCare Center & CN-Healthcare (2021).

Moreover, from the perspective of business content, since the Chinese government has elevated the prevention and treatment of some common disease and chronic disease to a national strategy (The General Office of the State Council, 2022), Internet hospitals are expected to develop more toward the management of common disease and chronic disease in the future. In addition, with many public hospitals opening Internet hospital services, there will certainly be a diversion of online users, and enterprise-led Internet hospitals will gradually transform into specialized hospitals.

3.4. Fundamental Problems that Internet Hospitals Face

Although Internet hospitals have long been regarded as the ultimate products of China’s Internet medical care, there are still some fundamental problems that need to be solved.

3.4.1. The Perspective of Government

From the government’s perspective, the supervision of access review of physicians in Internet hospitals is insufficient, and the boundaries for common diseases in practice remain unclear. As an effective supplement to the medical model, Internet hospitals should also follow the standard of online and offline homogeneity in developing all their diagnosis and treatment businesses. According to the relevant regulations, physicians carrying out Internet diagnosis and treatment activities should be qualified, have more than three years of independent clinical experience, and be approved by the medical institution where they practice registration. However, there are different standards and a lack of supervision to review and access online medical qualifications of physicians, which leads to uneven qualifications among online physicians. Further, the scope of common diseases has yet to be officially defined. As there may be cognitive differences between different subjects in practice, it is difficult to determine whether the treatment of some disorders is beyond the scope of common diseases treated on the Internet. Particularly when it comes to disputes between doctors and patients, there is no further clarification in the relevant policies on whether they will be subject to administrative punishment by the regulatory authorities and the extent of the sentence if they are beyond the scope of common diseases.

3.4.2. The Perspective of Medical Institutions

From the perspective of medical institutions, there are still problems that must be solved, such as a lack of standardization of the online consultation processes and follow-up services, a lack of independent and effective management and service mechanisms, and a lack of quality physician resources and complex talents.

First, the business contents of Internet hospitals run through the whole process of pre-consultation, consultation, and post-consultation of patients, while the current diagnosis and treatment norms still lack standardization. On the one hand, there is a lack of standardization in the online consultation process for patients. For example, issues of how to screen patients suitable for online consultation, improving the accuracy of patient disease treatment and the efficiency of doctor-patient communication, and ensuring continuity of treatment service according to patient and disease type after consultation are still facing a lack of standardization. On the other hand, online follow-up consultation for some common and chronic diseases comprises the most essential businesses of Internet hospitals, but the implementation standards for Internet hospitals to provide follow-up services vary between different areas. Some hospitals allow patients to upload their initial medical records, while others only allow patients whose initial consultation has been in their hospital.

Second, the standardized development of Internet hospitals requires a four-way tandem of service organizations, management agencies, business departments, and enterprises, where the administration department is responsible for indicating direction, introducing policies, and implementing supervision, the hospitals belong to the business side, and the enterprises provide Internet technical support. There is also a lack of an independent service management agency that serves as an intermediate bridge to connect all parties. At present, departments of information management in many hospitals are responsible for the operations of Internet diagnosis and treatment and telemedicine businesses, but this can easily lead to problems such as unclear definitions of functions between the business department and management department.

Lastly, the number of Internet hospital constructions has increased rapidly as medical institutions join the initiative. Patients prefer professional, competent, and experienced physicians to provide medical services online. However, most physician resources with high quality are concentrated in large tertiary hospitals, and most professional and experienced physicians are too busy to participate in Internet medical care. Motivating such physicians is one of the urgent problems to be solved. Moreover, the operation of Internet hospitals is new to most medical institutions, and questions of how to consult, charge, control the medical quality and publicize all directly impact the effectiveness of Internet hospitals. Internet medical care has high demands for new interdisciplinary and complex talents. However, most of the technicians responsible for the operation and management of Internet hospitals are information technicians. Whether it be a hospital- or an enterprise-led Internet hospital, there is a shortage of complex talents who simultaneously understand diagnosis and treatment, technology, and operation. In medical education, there are also fewer talents trained by related majors. The construction of a new composite talent gradient lags seriously behind the development of Internet medical care.

3.4.3. The Perspective of Platforms and Patients

For platform builders and maintainers, whether the Internet hospital is built by the medical institutions themselves or relies on a third-party, there is the problem of supporting software and hardware technical constraints. For example, technical issues related to cross-regional medical insurance information recognition and online real-time reimbursement of medical insurance, etc. These problems cannot be broken by any hospitals or Internet enterprises, rather need to rely on the development of the whole related industries.

Moreover, from the perspective of patients, there are problems such as the difficulty in changing medical habits, privacy security, and trust in Internet hospitals. First, there is a need for a process to cultivate and change public awareness and habits of online diagnosis and treatment. Although COVID-19 has mainly changed the medical habits of the public by making them gradually become used to Internet medical services, due to the vital path dependence of medical habits, once it returns to normal, people will continue to choose offline face-to-face communication with doctors. Second, with the popularization and application of health big data, the data "islands" in the traditional medical industry have gradually broken down. Expanding the scope of information dissemination has inevitably led to violations of patient privacy rights. In traditional medical care, patient privacy information is only shared with visiting physicians. By contrast, Internet hospitals face unique challenges, such as the diversity of patients' privacy infringing subjects, the difficulty of protecting privacy rights, and the passivity of data transfer. Lastly, due to the inherent characteristics of the Internet and factors such as information asymmetry in medical services, patients prefer to rely on word-of-mouth and online reviews to choose doctors. However, to improve the probability of being selected, some physicians are likely to use unfair competition methods such as hiring people to write favorable comments. Moreover, in the current absence of regulatory laws and regulations, some platform builders and maintainers may take non-compliant actions to increase the probability of successful transactions, thereby further influencing patient trust in Internet hospitals.

4. Discussions and Conclusions

4.1. Discussion and Implications

The aim of this study is to analyze the future development of Internet medical care by introducing an Internet diagnosis and treatment model with Chinese characteristics. This case study of Internet hospitals in China broadens and enriches our understanding of existing Internet medical models at the theoretical level.

First, as an effective supplement to the medical model of hospitals, Internet hospitals have extended medical services from “in-” to “out-of-hospital”, which breaks through the traditional constraints of time and space. Second, Internet hospitals have gradually become the ultimate model of Internet medical care. Compared to traditional telemedicine services, the most significant difference is that Internet hospitals are hospitals in essence and can employ physicians both in their own and in other medical institutions to carry out Internet diagnosis and treatment activities. Finally, Internet hospitals gradually develop toward online and offline collaborative models.

Regarding the practical implications of this study, although Internet hospitals have rapidly developed in China, they still face some fundamental problems, and finding solutions to these problems would provide some practical implications for the future development of Internet medical care for China and other countries. The basic problems of Internet hospitals have been discussed above from the perspectives of the government, physical medical institutions, platform builders and patients, respectively, but in fact, most of these problems need to be solved from the level of government and medical institutions.

For the government, the sustainable development of Internet medical care requires overall planning of policies and standards at the national level in the first place. The government should build a scientific planning system and industrial layout based on actual medical needs, formulate a regulatory mechanism that conforms to the general environment of the medical industry, and promulgate a safety system with corresponding laws, regulations, and standards. Further, the establishment and improvement of supporting mechanisms for dispute resolution, division of responsibilities and guarantees, and protection of rights and interests to further clarify the supervision responsibility, access management qualifications of Internet medical care, and patient privacy protection should be pursued so that Internet medical care can provide the same quality and guarantee medical services as hospitals. Moreover, improving public trust in Internet medical care is inseparable from government guidance. Along with supporting of relevant policies, the government should play a main role in the promotion of Internet medical care, so that the public can further understand that the essence of Internet healthcare is the medical service rather than the Internet service, and to enhance patient trust in Internet medical care, as well as guide more patients to change their traditional medical habits and choose a reasonable form of medical treatment.

For medical institutions, they should seize the policy opportunities to fully play the role of the main force of Internet medical services and continually promote collaborative diagnosis and treatment online and offline. First, the development paths of Internet medical care currently rely on medical institutions to carry out online diagnosis and treatment projects consistent with offline services. However, the businesses of Internet medical care are now more of supplements and improvements to offline diagnosis and treatment. Doing an excellent job of online and offline coordination is conducive to promoting joint development. Hence, offline diagnosis and treatment should introduce online service tools into daily diagnosis and treatment services by improving electronic health records and initiating online prescriptions, improving the medical experience of patients through Internet tools, and cultivating people’s habits and trust in Internet medical care. Similarly, online services should also focus on improving the efficiency and convenience of offline diagnosis and treatment and improving the allocation and service capabilities of medical resources particularly primary medical resources. Second, medical institutions should clearly define information security and medical responsibilities, formulate online risk notification and patient-informed consent systems, and develop online medical liability insurance to protect the rights and interests of physicians and patients. Third, for the evaluation of physicians who carry out diagnosis and treatment activities in Internet medical care, the medical quality evaluation and index system of physicians in hospitals should be referred to and a tripartite evaluation system for medical institutions, physicians, and patients should be further constructed. Fourth, medical institutions should begin with multipoint practice as the starting point and attract more professional and experienced doctors from large tertiary hospitals to join Internet medical care, and use the personnel system of full-time employment, part-time employment, and other odd jobs to promote the rational flows of medical talents to activate high-quality physician resources.

Finally, it is also necessary to attach importance to the cultivation of compound talents and to promote in-depth cooperation between industry, academia, and research as well, such as focusing on the intersection of computer, medicine, social security, and other disciplines, formulating the “Internet + medical” professional talent training plans,

providing professional training in cloud computing, big data, AI, and other technologies for personnel that is used in related positions.

4.2. Limitations and Future Research

This paper discusses the future development strategies of Internet medical care by taking China's Internet hospitals as an example case, but it does not involve any specific Internet hospitals. Therefore, in future studies, Internet hospitals in different cities should be selected as research samples to compare and analyze the differences in Internet medical care in different regions. Meanwhile, this study only involves Internet healthcare in China, and future studies can include samples from different countries, which will hopefully produce more meaningful academic and practical implications.

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References

- CN-Healthcare. (2020). The 'Internet + Medicine' utility report in the context of COVID-19. Retrieved February 3, 2020, from <http://zk.cn-healthcare.com/doc-show-39993.html>.
- Ge, P., Zhao, Y., & Han, C. (2021). Problems and countermeasures on the Implementation of Internet medical policy - an analysis based on smith model. *Health Economics Research*, 38(1), 17–2.
- Gu, Y., Wei, D., Cao, X., Zhang, C. & Feng, X. (2017). Analysis of the reason of the Internet hospital occurred in China. *Chinese health service management*, 34(06), 401–403.
- Han, Y., Lie, R. K. & Guo, R. (2020). The Internet hospital as a telehealth model in China: systematic search and content analysis. *Journal of medical internet research*, 22(7), e17995.
- iimedia Research. (2021). Research report on the development of Internet hospital industry of China in 2021. Retrieved November 15, 2021 from <https://www.iimedia.cn/c400/81955.html>.
- Jiao, Y. & Yu, F. (2021). Investigation on the status quo of outpatients' cognition of Internet medical services in Shanghai public hospitals from the perspective of public welfare. *Chinese hospital*, 25(9), 26–29.
- National Telemedicine and Connected HealthCare Center & CN-Healthcare. (2021). 2021 China e-hospital development report. Retrieved May 20, 2022, from <https://www.ntmchc.com/#/FileDownCate>.
- The General Office of the State Council. (2022). Notice on printing and distributing the '14th Five-Year' national health plan. Retrieved May 20, 2022, from <http://www.gov.cn>.
- The National Health Commission & the State Administration of Traditional Chinese Medicine. (2018). Notice on the issuance of three documents, including the Internet medical treatment management measures (trial). Retrieved July 17, 2018, from http://www.gov.cn/zhengce/zhengceku/2018-12/31/content_5435436.htm.
- The National Health Commission. China health care statistics yearbook (2021). Peking, China: Peking Union Medical College Press.
- Yip, W. & Hsiao, W. (2014). Harnessing the privatisation of China's fragmented health-care delivery. *Lancet*, 384(9945), 805–818.
- Zhu, J. (2016). Internet + medical mode: contents and system architecture. *Chinese hospital management*, 36(1), 38–40.