Research on Optimization Strategies for Online Diagnosis and Treatment Services under the Background of Internet+Healthcare

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Abstract: In the era of the booming development of "internet + Healthcare", online medical services, as the core model of innovation and reform in the medical industry, are profoundly affecting the supply and acquisition of medical services. This study deeply analyzes the current status of online medical services and finds that although it has achieved remarkable results in improving medical efficiency and improving service accessibility, it still faces such many problems as technical bottlenecks, lagging laws and policies, unsmooth medical service processes, lack of communication and trust between doctors and patients, and high data security and privacy risks. In order to break through these development difficulties, this study proposes optimization strategies from multiple dimensions such as technological innovation and application formulation of laws and policies and standards. optimization of medical service processes communication and trust between doctors and patients, and data security and privacy protection ,aiming to build a more complete, efficient and secure online medical service system, in order to provide theoretical support and practical guidance for the continuous improvement and healthy development of online medical services.

Keywords: Internet + Healthcare; Online Diagnosis and Treatment; Service Optimization; Strategy Research

1. Introduction

With the rapid development of information technology, "Internet + Healthcare" has become an important force driving innovation and transformation in the medical industry. As a core component of it, online diagnosis and treatment services, under the background of "Internet + Healthcare", have changed the traditional medical treatment model. Patients can conduct remote consultations, diagnoses, and treatments with doctors through Internet platforms, breaking the limitations of geography and time and improving the accessibility of medical services [1]. By December 2022, the scale of online medical users in China reached 363 million, an increase of 64.66 million compared with December 2021, accounting for 34% of the total netizens. With its advantages such as convenience and high efficiency, online diagnosis and treatment services have gradually become an important supplement to the medical service system. Online diagnosis and treatment services help optimize the allocation of medical resources [2]. Through Internet platforms, patients can choose suitable doctors and medical institutions according to their own needs, achieving the rational utilization of medical resources and alleviating the problems of "difficulty and high cost of seeing a doctor" to a certain However, the extent. promotion and application of online diagnosis and treatment services have also exposed a series of problems, such as uneven quality of online diagnosis and treatment, increased difficulty in patient privacy protection, and increased risks to medical data security [3]. The existence of these problems not only affects the sustainable development of online diagnosis and treatment services but also poses a potential threat to patients' health rights and interests [4]. Based on this, this paper analyzes the main problems existing in current online diagnosis and treatment services and their causes, draws on the successful experiences of online diagnosis and treatment services at home and abroad, and combines the actual situation of China's medical system to put forward practical optimization suggestions, providing a scientific and systematic theoretical basis and practical guidance for the optimization of online diagnosis and treatment services.

2. Overview of Online Diagnosis and Treatment Services in the Context of "internet + Healthcare"

With the continuous development and popularization of internet technology, the medical industry has also witnessed new changes. "Internet + Healthcare", as an emerging service model, closely integrates the Internet with medical services, providing patients with a more convenient and efficient diagnosis and treatment experience [5]. As an important part of "Internet + Healthcare", online diagnosis and treatment services, through Internet platforms, enable functions such as remote diagnosis and treatment, online consultation, and health management between doctors and patients. This service model breaks the time and space limitations of traditional medical services, allowing patients access professional medical services to anytime and anywhere, greatly improving the accessibility and convenience of medical services [6]. At the same time, online diagnosis and treatment services also promote the optimal allocation of medical resources, enabling more rational utilization of doctor resources and effectively alleviating the shortage of medical resources [7]."Internet + Healthcare" is a new medical service model that deeply integrates Internet technology with the traditional medical industry [8]. By leveraging information technologies such as the Internet, big data, cloud computing, and artificial intelligence, it realizes the digitization, intelligence, and convenience of medical services [9]. It is not simply about moving medical services online but rather comprehensively optimizing and reshaping aspects such as the medical service process, resource allocation, and doctor - patient relationship through innovative thinking and technological means, thus constructing a more efficient, fair, and accessible medical service system.

3. Analysis of the Current Status of Online

Diagnosis and Treatment Services

In recent years, the user base of online diagnosis and treatment has grown rapidly. With the popularization of Internet technology and the increasing demand for convenient medical services, more and more people are beginning to try and rely on online diagnosis and treatment. The types of online diagnosis services have treatment become and increasingly diverse, covering areas such as online consultations, remote consultations, online follow - ups, and health management. As the most basic service, online consultations allow users to communicate with doctors via text, voice, or video to describe their symptoms, and doctors provide preliminary diagnoses and treatment recommendations based on the information provided [10]. Remote consultations are mainly used for the diagnosis of complex and difficult cases, integrating expert resources from various regions to achieve cross - regional medical collaboration. Online follow - up services greatly facilitate patients with chronic diseases and those in postoperative rehabilitation. Instead of frequently queuing for registration at hospitals, patients can communicate with doctors through online platforms at scheduled follow - up times. Doctors adjust treatment plans and issue electronic prescriptions according to changes in patients' conditions. Health management services focus on monitoring and analyzing users' health data to provide personalized health advice and preventive measures. Online diagnosis and treatment services have gradually expanded from major cities to medium - sized, small cities, and even rural areas. Currently, most tertiary hospitals in China have launched online diagnosis and treatment services, and some primary medical institutions are actively connecting to online diagnosis and treatment platforms to enhance their medical service capabilities. However, there are still development gaps between different regions. The quality and coverage of online diagnosis and treatment services in economically developed areas are significantly better than those in less developed regions. To promote the healthy development of online diagnosis and treatment services, the state and local governments have introduced a series of supportive policies, clarifying the legal status of online diagnosis and treatment services

from a policy perspective, encouraging medical institutions to carry out Internet based medical services, and promoting the optimal allocation of medical resources.

4. Problems in Online Diagnosis and Treatment Services

4.1 Technical Bottlenecks Restricting User Experience

Despite the continuous development of Internet technology, online diagnosis and treatment are still plagued by technical problems. Network instability occurs frequently, especially in remote areas or during peak network usage hours. It is common for video consultations to freeze or disconnect, which seriously interrupts the diagnosis and treatment process, resulting in poor communication between doctors and patients, affecting the integrity of information transmission, and making it difficult for doctors to obtain patient information in a timely and comprehensive manner for accurate diagnosis. Moreover, the functions of the current online diagnosis and treatment platforms are still not perfect enough. The operating interfaces of some platforms are complex, making it difficult for patients, especially elderly patients, to quickly get started. Operational errors are prone to occur in registration, consultation, payment and other links. Some platforms have technical barriers in terms of medical record sharing and mutual recognition of examination and test results, making it impossible to achieve efficient circulation and integration of medical information, hindering the continuity of diagnosis and treatment services.

4.2 Laws and Policies are Lagging behind and Difficult to Adapt to Development

At present, the legal and regulatory system for online diagnosis and treatment is still imperfect. The definition of medical responsibility in the process of online diagnosis and treatment is vague. Once a medical dispute occurs, it is difficult to determine whether it is caused by a doctor's misdiagnosis, a platform technical failure, or false information provided by the patient. There is a lack of clear basis for the division of responsibilities and investigation. At the same time, the entry threshold and industry

standards for online diagnosis and treatment are not unified. The conditions for online diagnosis and treatment on different platforms and medical institutions vary. Some platforms do not strictly review the qualifications of and there is doctors. а risk of non-professionals providing diagnosis and treatment services, this poses a potential threat to the life and health of patients and disrupts the order of the online diagnosis and treatment market.

4.3 Medical Service Process is not Smooth

There is a gap in the connection between online diagnosis and treatment and offline medical services. After completing the online consultation, if the patient needs further offline examination and treatment, there is a lack of effective coordination mechanism in the appointment and referral process, which causes patients to run between online and offline, consuming a lot of time and energy, and failing to truly enjoy convenient medical services. In addition, there are also problems with the follow-up process of online diagnosis and treatment. For long-term follow-up treatment of chronic patients, there is a lack of standardized follow-up plans and effective means of disease monitoring. It is difficult for doctors to accurately grasp the changes in patients' conditions, which affects the treatment effect.

4.4 Lack of Doctor - Patient Communication and Trust

Online communication methods have natural limitations. Compared with traditional face-to-face diagnosis and treatment, doctors cannot obtain comprehensive information by directly observing the patient's facial expressions, demeanor, body movements, etc., and relying solely on the patient's description of symptoms may miss key details of the condition, affecting the accuracy of the diagnosis. Moreover, patients generally do not have high trust in this emerging model of online diagnosis and treatment. They are worried that doctors cannot accurately judge their condition and have doubts about the diagnosis and treatment plans prescribed online. This has hindered the promotion and popularization of online diagnosis and treatment services to a certain extent.

4.5 High Risks of Data Security and Privacy

Online diagnosis and treatment involves the collection, storage and transmission of massive amounts of patient medical data, and data security faces severe challenges. Some online diagnosis and treatment platforms have weak security protection technology and are vulnerable to hacker attacks, resulting in the leakage of sensitive data such as patient personal information and medical records. which brings great distress to patients, such as the risk of fraud and exposure of personal privacy At the same time, in the process of data use, there is a lack of strict and standardized data access rights management, and there is a risk of data abuse, such as data being illegally used for commercial marketing, unauthorized scientific research purposes, etc., which seriously infringes on patients' privacy rights.

5. Optimization Strategies for Online Medical Services

5.1 Technological Innovation and Application

Increase investment in network infrastructure construction, especially strengthen network coverage in remote areas, improve network stability and bandwidth, and ensure smooth audio and video transmission during online diagnosis and treatment, At the same time, promote the technical upgrade of online diagnosis and treatment platforms ,and use artificial intelligence technology to optimize platform functions, such as developing an intelligent guidance system to quickly match appropriate departments and doctors based on patient symptoms; use big data analysis to achieve automatic classification of medica records and intelligent interpretation of inspection and test results to improve diagnosis and treatment efficiency. Introduce blockchain technology to ensure the safe storage and sharing of medical data, realize the trusted flow of medical record information between different medical institutions and different platforms, and improve the accuracy and integrity of data.

5.2 Formulation of Regulations, Policies, and Standards

Accelerate the formulation and improvement of laws and regulations related to online diagnosis and treatment, clarify the principles for determining medical responsibilities for online diagnosis and treatment, and refine the rights and obligations of doctors, platforms, and patients during the diagnosis and treatment process. Unify the entry threshold and industry standards for online diagnosis and treatment. strictly review the qualifications of online diagnosis and treatment platforms and doctors, and require platforms to have a complete technical guarantee, medical quality control, and information security management system. Doctors must have the corresponding professional qualifications and undergo special training for online diagnosis and Establish treatment. and improve the regulatory mechanism, strengthen daily supervision and inspection of online diagnosis and treatment services, crack down on violations, and maintain market order.

5.3 Optimization of Medical Service Processes

Build an integrated online and offline medical service process, establish an online and offline referral green channel, and if patients need offline services after online diagnosis and treatment, the platform can directly make appointments for examinations, hospitalization, etc., and share patient diagnosis and treatment information with offline medical institutions in real time to achieve seamless connection. For patients with chronic diseases, formulate standardized online follow-up processes, use remote monitoring technologies such as wearable devices to collect patients' physiological data in real time, and doctors adjust treatment plans in time according to data changes to provide patients with continuous and accurate medical services. At the same time, optimize the registration, consultation, payment and other processes within the online diagnosis and treatment platform, simplify the operating steps, and improve the convenience of patients' medical treatment.

5.4 Doctor - Patient Communication and Trust Building

Innovate the way doctors and patients communicate. In addition to text, voice, and video encourage the platform to develop more auxiliary communication tools, such as symptom visualization tools, to help patients express their condition more clearly. Doctors should pay more attention to communication skills during the diagnosis and treatment process, listen patiently to patients' demands, explain the diagnosis basis and treatment plan in detail, and enhance patients' confidence in online diagnosis and treatment. Strengthen the publicity and promotion of online diagnosis and treatment services, improve patients' awareness and trust in online diagnosis and through successful treatment case presentations, popular science lectures, etc. and guide patients to correctly understand and accept online diagnosis and treatment services.

5.5 Data Security and Privacy Protection

Online diagnosis and treatment platforms should strengthen investment in data security protection technology, use advanced encryption algorithms to encrypt, store and transmit patient data to prevent data theft or tampering. Establish a strict data access rights management system, reasonably allocate data rights according employee access to responsibilities and business needs, and ensure that only authorized personnel can access patient data, At the same time, strengthen data security and privacy protection training for platform employees, improve employees' safety awareness, and prevent data leakage caused by illegal operations by internal personnel. In addition, regularly conduct data security risk assessments and tests, promptly discover and repair security vulnerabilities, and ensure patient data security and privacy.

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