

Research on the Application of AI Combined with Remote Medical Care in the Context of Population Aging

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ABSTRACT

In the context of the new era, artificial intelligence (AI) has been elevated to the national strategic level and included in the national key research and development plan. AI empowers medical equipment to demonstrate outstanding precision, efficiency, and automation levels, greatly improving the service level in the medical field. This paper starts with an analysis of the current situation of elderly people seeking medical treatment under the background of population aging, elaborates on the application value of AI combined with remote medical care, and explores the application path of AI combined with remote medical care under the background of population aging.

KEYWORDS

population aging; artificial intelligence; remote healthcare

1 Introduction

With the continuous increase of the elderly population in our country, the problem of population aging is becoming increasingly prominent. The elderly population, accompanied by weakened physiological functions, gradually increases the likelihood of disease occurrence, and their demand and quality requirements for medical services are also constantly increasing. Due to uneven distribution of medical resources and limited medical personnel, a large number of elderly people find it difficult to access effective and timely medical services. In this context, telemedicine has gradually gained popularity due to its various advantages. Especially with the development and application of AI in recent years, a more intelligent and reliable medical system can be built to provide more ideal medical security for the elderly, relying on the combination of AI and telemedicine. [1]

2 Current situation analysis

Firstly, according to relevant statistical data, China has entered an aging society since the beginning of the 21st century and has shown an accelerating trend of development; It is expected that by 2025, the population of people aged 60 and above in China will reach as many as 300 million, making it a truly aging country. Population aging will weaken the family's elderly care function and increase the burden on the government and society for elderly care; In addition, elderly people often have various chronic diseases, and their demand for medical treatment has significantly increased, leading to a trend towards normalized care and nursing. As a result, the contradiction of insufficient medical security supply has become increasingly prominent, not only affecting the quality of life of the elderly, but also bringing various family and social problems.

Secondly, due to the unique physical and mental characteristics of the elderly, they have an inseparable connection with the field of healthcare. At the same time, elderly people are gradually entering a stage of cognitive aging disadvantage; Faced with the rapid development of modern technology, elderly people exhibit significant maladjustment, such as a shortage of human resources, especially service personnel, in medical institutions, irregular arrival times of external volunteers, unreasonable personnel allocation, and lack of standardization in service behavior. This makes it difficult for elderly people to adapt when seeking medical treatment.

Once again, due to the limited ability of elderly people to learn and accept new things, they may have a fear of learning advanced technologies and have negative experiences when using them. It leads to their aversion to making appointments through mobile mini programs, scanning QR codes on smart devices, and paying through self-service machines when seeking medical treatment. Faced with the confusion of intelligent devices in medical institutions, coupled with the complex medical process, elderly people are all facing common problems such as "not understanding", "not finding", and "unable to wait". If some elderly people seek medical treatment without their children accompanying them, they often have no way to start the medical process under the informationization construction of medical institutions, which increases the difficulty of elderly people seeking medical treatment.

3 The Application Value of AI Combined With Remote Healthcare

3.1 Improving Diagnostic Efficiency and Accuracy

With the promotion and application of information technologies such as big data, cloud computing, and AI in the field of medical equipment in recent years, medical devices continue to innovate and the new concept of "smart healthcare" has emerged; Based on advanced medical equipment, this emphasizes the construction of a new medical model closely related to patient data, to achieve close interaction between patients, medical institutions, medical personnel, and medical equipment. Based on this new medical model, AI combined with telemedicine has entered the public eye. Relying on diagnostic assistance systems, AI can comprehensively analyze the massive patient data collected by medical institutions, providing efficient and accurate disease identification and diagnosis support for medical personnel.

3.2 Optimizing the Patient's Medical Experience

Under the combination of AI and remote medical applications, patients can receive high-quality medical services at home or elsewhere without the need to go to medical institutions. In this way, not only can patients save the tedious medical process, but it can also bring effective convenience to patients with time constraints or limited mobility. Meanwhile, for people living in remote areas or areas with limited medical resources, the combination of AI and remote medical applications can break geographical limitations and provide them with access to professional medical services. With the support of advanced information technology, AI combined with remote healthcare can develop personalized health management plans for patients based on their relevant data, meeting their individual needs and providing them with a better medical experience.

3.3 Coordinating the Distribution of Medical Resources

For a long time, there has been an issue of uneven distribution of medical resources in China, which has made it difficult for patients in many regions to access timely and high-quality medical

services. The combination of AI and remote medical applications can effectively promote the coordinated and balanced distribution of medical resources. With the continuous development and application of information technology, the combination of AI and remote medical applications has gradually become an effective path to solve the problem of uneven distribution of medical resources in urban and rural areas. It can help build a closer connection between patients and medical staff, effectively solving the problems of inconvenient and expensive medical treatment faced by grassroots people. This enables more precise allocation of medical resources to relevant groups in need.

4 The Application Path of AI Combined with Telemedicine under the Background of Population Aging

4.1 To Promote the Construction and Improvement of Relevant Infrastructure and Supporting Facilities

Firstly, we should promote the construction and improvement of the medical Internet of Things. Different from the traditional Internet, the Internet of Things is a physical object network connected with sensors, which can realize a series of functions such as data processing, automatic transmission, network communication, etc. By promoting the effective integration of AI technology and the Internet of Things, medical service processes and models can be optimized, providing effective convenience for patients seeking medical treatment; Automatic registration starts from the patient entering the medical institution, AI remotely guides the examination waiting process, and automatically transmits relevant clinical data to the patient's electronic medical record file. If relevant data information triggers an alarm or new diagnostic results are obtained, the data can be transmitted to a remote expert end, where experts can observe the patient's medical history data in a timely manner and provide further comprehensive diagnosis and treatment services for the patient. During this process, the diagnosis and treatment records of different medical personnel can be integrated into the same IoT port, providing effective convenience for different receiving medical personnel to view patient treatment and treatment records. By storing system records of different medical personnel's preferred diagnosis and treatment plans, reliable basis can be provided for high-quality and efficient diagnosis and treatment work. [2] In addition, the massive data generated by the Internet of Things can be processed and analyzed through AI to effectively optimize various functions of the Internet of Things. For example, close monitoring and efficient transmission of vital signs such as patient temperature, heart rate, and blood pressure can be achieved through AI technology combined with IoT terminals and sensors. This can provide intelligent assisted diagnosis and treatment services for patients, enhancing the depth and breadth of AI combined with remote medical applications in the context of an aging population.

Secondly, we should promote the construction and improvement of remote medical platforms. AI based remote medical platforms can rely on cross regional patient medical record data to provide patients with remote medical services that break free from time and space limitations. Specifically, after the integration of AI systems, relevant data of patients in various regions and medical institutions can be comprehensively integrated for remote viewing by medical personnel; At the same time, AI can provide support for clinical data analysis for medical personnel, allowing them to provide diagnosis and treatment recommendations through remote medical platforms, creating great convenience for patients to obtain diagnosis and treatment services. For example, Chinese PLA General Hospital will introduce the chest intelligent medical imaging diagnosis technology in 2020, complete the integration and call of the data related to the remote consultation platform with the aid of AI system, conduct data analysis through AI, and propose algorithm operation tasks; This

will further transmit the analysis data results to the remote consultation platform cloud, providing a basis for consultation medical personnel to make diagnosis and treatment decisions, and effectively improving the quality and efficiency of consultations.

4.2 To Strengthen Data Security and Privacy Protection

In the combination of AI and remote medical applications, massive patient data relies on transmission and storage through network platforms; This requires medical institutions to strengthen data security and privacy protection. Firstly, medical institutions should establish a scientific and comprehensive data security management system to ensure data security and integrity. This system specifically includes strict control of access permissions, and relevant personnel must obtain authorization in advance to access data; Data transmission and storage encryption mechanisms should be established to ensure the security of data during transmission and storage; We should also promote timely identification and evaluation of system security vulnerabilities, identify and repair potential security risks in a timely manner, and effectively reduce the risk of security incidents. [3] Secondly, medical institutions should strictly comply with the relevant laws and regulations on data security protection in China, ensuring the legal and reasonable use of patient data. When collaborating with third parties to promote data analysis and processing, strict confidentiality agreements and data processing agreements should be signed to effectively clarify the rights and responsibilities of all parties involved in the use of data. On this basis, medical institutions should also increase their research efforts on artificial intelligence algorithms that can achieve reliable privacy protection functions, and use techniques such as homomorphic encryption and differential privacy to effectively utilize the application value of AI in remote healthcare while effectively protecting patient privacy.

4.3 To Improve Technical Standardization and Interoperability Level

In the combination of AI and remote medical applications, it is crucial to achieve data exchange and integration between various system platforms in order to provide efficient services to patients. In view of this, it is necessary to establish a unified technical standard and interoperability architecture to enhance the technical standardization and interoperability level of AI combined with remote medical applications. Firstly, a unified data format and communication protocol should be established to achieve interconnectivity of data between different system platforms. At the same time, an open application connection interface and data exchange platform should be created to provide reliable data exchange and sharing support for medical institutions and third parties. Secondly, to promote the exchange and cooperation between standard setting organizations and industry associations, it is necessary to collaborate in establishing relevant technical standards and interoperability specifications for the integration of AI with remote medical applications, providing strong guidance for the integration of AI with remote medical applications and promoting the widespread application of technology. At the same time, it is necessary to promote communication and cooperation between medical institutions and third parties, collaborate in researching and overcoming technical standards and interoperability related challenges, promote the standardization and normalization of AI combined with remote medical applications, and improve the quality and efficiency of remote medical services. [4] In addition, given the unique needs of elderly people for medical services in the context of population aging, most of them are accompanied by various chronic diseases and complex physical conditions. In view of this, in the application of AI combined with remote medical care, it is necessary to combine the physical and mental characteristics and actual needs of the elderly population to provide them with more high-

quality and targeted medical services.

5 Conclusion

In summary, with the continuous development of modern information technology, the combination of AI and remote healthcare has demonstrated many beneficial application values for the elderly population. However, the current combination of AI and remote medical applications still faces many challenges, including basic equipment matching, data security, privacy protection, etc; We can comprehensively improve various aspects of work by promoting the construction and improvement of related infrastructure, strengthening data security and privacy protection, enhancing technical standardization and interoperability, and further promoting the implementation and promotion of AI remote medical systems. This can effectively improve the satisfaction of patients seeking medical treatment and benefit them from it.

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