

Artificial Intelligence in Geriatric Patient Follow-up: Impact on Physician Workload and Clinical Applications

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Abstract

Purpose: The rapid advancements in artificial intelligence (AI) have significantly influenced healthcare, especially in geriatric patient monitoring, a complex process due to multimorbidity, polypharmacy, and frailty. This study aims to evaluate the role of AI applications in geriatric monitoring and examine their potential impact on reducing physicians' workload.

Methods: A comprehensive literature review was conducted, covering current AI-supported patient monitoring systems, clinical decision support tools, and workflow automation. Areas such as diagnosis, treatment planning, and real-time health monitoring via wearable technologies were examined in detail.

Results: AI-supported systems have been shown to facilitate early diagnosis, optimize treatment planning, and improve clinical decision-making. These systems enhance patient outcomes while reducing administrative burdens on physicians. Remote monitoring and predictive analytics enable timely interventions, potentially reducing hospital admissions and emergency visits. Furthermore, AI-based automation can take over routine tasks, increasing clinical workflow efficiency.

Conclusion: The integration of AI into geriatric patient monitoring offers the potential to improve healthcare efficiency, enhance patient safety, and reduce physicians' workload. However, ethical concerns, data privacy, and AI system reliability must be carefully addressed. Future research should focus on developing user-friendly AI systems and evaluating their long-term clinical effectiveness.

Key words: Artificial Intelligence, Clinical Decision Support, Digital Health, Geriatrics, Healthcare Automation, Physician Workload

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Introduction

The aging process brings about many physical, psychological and social changes in individuals. A multidisciplinary approach is required to manage this process effectively. Factors such as multiple diseases, polypharmacy and frailty, which are common in elderly individuals, require a special understanding of care. The aim of this process is to analyze the medical needs of patients comprehensively and to ensure that appropriate health services are provided in a timely and effective manner. Geriatric patient follow-up plays a critical role in the process of assessing and managing the health status of elderly individuals.

In recent years, the increasing prevalence of artificial intelligence (AI) applications in the field of healthcare has led to significant changes in geriatric patient follow-up. The rapid increase in the elderly population and the corresponding increase in the need for healthcare services bring the opportunities offered by AI in this field to the forefront (1). Geriatric patient follow-up physicians undertake important responsibilities such as continuously monitoring the general health status of elderly individuals, detecting age-specific health problems at an early stage and managing these processes effectively. In this context, geriatric follow-up processes should be carried out

meticulously in order to improve the quality of life of elderly individuals and minimize health problems (2).

The main aim of this study is to examine the role of AI applications in geriatric patient follow-up and to evaluate their potential to alleviate the workload of physicians. In this direction, existing data were analyzed using literature review and compilation method, and a comprehensive evaluation was made on the integration of AI into health service delivery.

Process Management in Geriatric Patient Follow-up

Health problems that arise with aging make geriatric patient follow-up a very complex process. Many factors such as the increase in chronic diseases, drug interactions due to polypharmacy, risk of falls, nutritional deficiencies and loss of cognitive function indicate the need for a special approach in geriatric patient care. Effective management of these factors is of great importance in terms of improving the health status of elderly individuals and increasing their quality of life (3).

In the geriatric patient follow-up process, personalized health services should be provided for the needs of individuals. This approach can make the process more efficient and effective for both patients and

healthcare professionals. Today, traditional methods used in geriatric patient follow-up increase the workload of physicians and make it difficult to respond quickly enough to the individual health needs of patients. Therefore, technological solutions and artificial intelligence-supported systems can contribute to more effective management of the process.

Artificial Intelligence Applications in Medicine and Health Management

What is Artificial Intelligence?

Artificial intelligence (AI) refers to computer systems that mimic human intelligence and can perform specific tasks. In healthcare delivery, AI is widely used to optimize the diagnosis and treatment processes of patients, improve medical imaging analysis, accelerate drug research and increase the overall efficiency of healthcare services. Especially thanks to big data analysis and machine learning techniques, many processes in the field of healthcare are being made faster and more efficient (4). AI techniques such as machine learning and deep learning can analyze large-scale health data to help diagnose certain diseases early. In addition, by evaluating the individual health histories of patients, they can enable the creation of personalized treatment plans. This makes clinical decision-making faster and more

accurate and reduces the workload of physicians (5).

Artificial Intelligence Applications in Healthcare

AI is used effectively in many areas such as diagnosis, treatment planning, patient follow-up and hospital management in the provision of medical and healthcare services. Especially in the field of medical imaging, cancer screenings, radiological evaluations and pathological analyzes can be performed faster and more accurately thanks to artificial intelligence-supported systems. These systems allow images to be analyzed automatically and abnormalities to be detected at an early stage, helping physicians to make more informed decisions (6).

In addition, AI-based patient monitoring systems analyze the data obtained from patients and provide recommendations to healthcare professionals. Thanks to these systems, the health status of individuals can be continuously monitored and early interventions can be made when necessary. In this way, patients' access to healthcare services is facilitated and the workload on healthcare professionals is eased.

Artificial Intelligence Applications in Geriatric Patient Follow-up

In geriatric patient follow-up, artificial intelligence stands out as an important tool

that facilitates the monitoring and management of the health status of elderly individuals. Modern technology makes it possible to collect and analyze the health data of the elderly, who may be more difficult to admit to hospital than younger people, and provide real-time information to healthcare professionals. Thus, physicians can monitor the health status of their elderly patients more closely and intervene early (7).

Smart sensors and wearable health technologies can monitor the daily activities of individuals and provide instant data to healthcare professionals. These systems offer a great advantage in assessing the general health status of elderly individuals, allowing healthcare professionals to recognize changes in patients early. By increasing the accuracy and efficiency of these, artificial intelligence-supported patient monitoring systems improve the quality of healthcare services and contribute to improving the quality of life of elderly individuals (8).

Patient Follow-up and Monitoring

Patient tracking and monitoring is one of the areas where AI technologies have shown the most development. These systems offer the opportunity to continuously monitor and analyze individuals by collecting their medical data. Patients' daily life activities, laboratory results and general health status

are regularly monitored, providing instant data flow to physicians. In this way, healthcare professionals can respond quickly to patient situations and perform appropriate interventions when necessary (9).

By analyzing patient data, these AI systems identify potential health risks and alert healthcare professionals early, helping them to take preventive measures. Thus, the progression of diseases can be prevented and individuals can lead a healthier life.

Diagnosis and Treatment Support Systems

AI applications in geriatric patient follow-up include data analysis systems that make diagnosis and treatment processes more effective. AI-supported decision-making systems can guide healthcare professionals by evaluating patients' medical imaging data. This facilitates early diagnosis of diseases and the creation of personalized treatment plans (10).

For example, artificial intelligence-based models have been developed to predict geriatric syndromes such as sarcopenia, malnutrition and fall risk. By analyzing the clinical data of patients, these systems provide important insights to healthcare professionals and help minimize health risks that may occur in elderly individuals. AI not only facilitates individual patient

follow-up, but also increases the overall efficiency of healthcare services, enabling the implementation of more effective treatment methods (11).

Workload of Physicians and the Problems

The workload of physicians in healthcare services is becoming a bigger problem due to many factors such as the increasing number of patients, the intensity of diagnosis and treatment processes, and the necessity to access continuously updated medical information. In addition, additional responsibilities such as patient assessments, management of medical records and administrative tasks increase the pressure on physicians by making time management difficult (12). Geriatric patient follow-up is a process that requires more time and attention compared to other medical fields, especially due to the multiple diseases and complex treatment processes of elderly individuals. Factors such as regular follow-up of this patient group, chronic disease management, control of drug interactions and prevention of possible complications significantly increase the workload of physicians (13).

Workload in Geriatric Patient Follow-up

Geriatric patient care is a process that usually requires long-term follow-up and a multidisciplinary approach. The fact that

most elderly patients have multiple health problems makes treatment plans more complex and increases the workload of healthcare professionals. In addition, age-related changes such as cognitive decline and communication difficulties may further complicate patient-physician interaction and hinder the effective delivery of health services (14).

Artificial intelligence-based decision support systems have the potential to ease the workload of physicians in geriatric patient follow-up. Studies have shown that these systems can reduce the time allocated per patient for patient evaluation (15). While this enables physicians to manage their time more efficiently, it also has the potential to improve the quality of healthcare services provided per patient. In addition to the potential of AI applications to reduce healthcare costs, it should also be taken into consideration that it may lead to an increase in human life expectancy with the improvement of healthcare service quality.

Physician Challenges in Elderly Patients

One of the biggest challenges faced by physicians involved in the follow-up of geriatric patients is time management problems due to their busy work schedule. Monitoring complex treatment plans, regularly updating patient health records and maintaining healthy communication

between patients and their families create a significant pressure on physicians (16).

However, cognitive decline and linguistic communication difficulties, which are common in elderly individuals, may make diagnosis and treatment processes more complex. Such situations make it difficult for physicians to communicate effectively with patients and may negatively affect the quality of health services (17). Lack of involvement of family members in patients' health processes or problems in family dynamics may make it more difficult for older individuals to access health services.

AI-enabled healthcare systems stand out as an important aid in overcoming such challenges. For example, in processes such as automatic scheduling of patient appointments, digital tracking of medication use and regular analysis of health data, AI technologies can reduce the burden on physicians and make healthcare services more efficient (18).

Potential to Reduce Workload of Physicians with Artificial Intelligence

AI is an increasingly widespread technology in the healthcare sector and is considered as an important tool to reduce the workload of physicians. AI applications such as automatic data analysis, patient follow-up, acceleration of diagnostic processes and clinical decision support

systems help to ease the burden on physicians. Especially in processes that require time-consuming and detailed evaluation, such as geriatric patient follow-up, the effective use of artificial intelligence-supported systems can increase the efficiency of healthcare services (19).

AI-based systems are known to reduce the routine workload of physicians, allowing them to use the time allocated per patient more efficiently. For example, by continuously monitoring and analyzing patients' health data, physicians can focus only on critical cases and thus conduct a more effective intervention process (20).

Artificial Intelligence Supported Clinical Decision Processes

AI can help healthcare professionals make faster and more accurate decisions in diagnosis and treatment processes. Clinical decision support systems can identify potential health risks in advance by evaluating patients' medical histories with big data analysis. Thus, physicians can analyze patients' health conditions more quickly and create appropriate treatment plans (21).

Studies have shown that AI-supported systems can provide up to 20% improvement in drug dosage adjustments and treatment planning (22). While such applications increase patient safety, they

also reduce the likelihood of healthcare professionals making mistakes.

Increased Workflow and Productivity with Artificial Intelligence

The integration of AI-supported applications into healthcare service delivery makes significant contributions to accelerating workflow and increasing overall efficiency. The use of artificial intelligence, especially in areas such as patient follow-up, data analysis and medical imaging, enables processes to be completed in a shorter time (23).

In addition, AI systems can also reduce the administrative burden on healthcare staff. For example, automated scheduling of patient appointments, storing and analyzing patient data digitally, and digital reminders to patients and physicians for early screening for health problems that patients may potentially face as they age can reduce the risks for healthcare workers, allowing them to care for more patients in their working time. This would both ensure that patients receive better healthcare and improve the overall efficiency of the healthcare system (24).

Ethical and Safety Issues

With the widespread use of AI in healthcare, ethical and security issues are becoming increasingly important. Although AI systems can optimize diagnosis and

treatment processes by analyzing patient data, it is of great importance that these technologies are used in accordance with ethical principles. Issues such as patient privacy, data security and algorithmic fairness are among the critical points to be considered in the integration of AI into healthcare (25).

During the integration of AI-supported systems into healthcare services, physicians and healthcare organizations should act in accordance with ethical standards. In this context, patient information should be protected, data security should be ensured at the highest level, and conditions should be adopted in which AI systems will show a fair and impartial approach in decision-making processes (26).

Ethical Principles in Artificial Intelligence Applications

In order for AI applications to be used effectively and reliably in the field of health, some basic ethical principles should be observed. These principles include transparency, accountability, data privacy, fairness and ethical audit processes (27).

Transparency: Clear and understandable information on how AI systems work should be provided.

Accountability: Physicians and healthcare organizations should develop specific

procedures to determine responsibility for decisions made by AI.

Data Confidentiality: The security of patients' data must be ensured and data storage measures that include encryption methods specific to the protection of personal information must be taken.

Fairness and Impartiality: It should be ensured that AI algorithms are not biased against any patient group. Different decisions for the same situations at different times should be avoided.

Data Security, Privacy and Protection Methods

One of the biggest controversies of AI applications is the security and privacy of patient data. AI systems used in healthcare process and analyze large amounts of sensitive data. Ensuring data security in this process is a critical requirement to prevent the misuse of patients' personal information (28).

In order to protect patient data, healthcare organizations need to take stringent security measures. These measures include the use of data encryption methods, tightening access controls and establishing continuously updated protection systems against cyber security threats. In addition, the anonymized processing of patient data by AI algorithms is considered as an effective method to ensure data privacy (29).

Considering all these factors, AI systems need to be developed within the framework of ethical rules and subjected to strict control mechanisms in terms of data security. In this way, AI technologies can be used reliably and effectively in the field of health.

Conclusion and Recommendations

The rapid development of AI in medicine and healthcare delivery has the potential to alleviate the challenges faced by physicians, especially in geriatric patient care. Advantages such as analyzing patient data, improving early diagnosis and treatment processes, and making healthcare services more efficient reveal the importance of AI-supported systems in healthcare (30).

The findings show that AI provides significant time savings for physicians in patient follow-up and clinical decision-making processes. In addition, AI-based diagnosis and treatment systems support clinical decision-making processes with high accuracy rates, contributing to an increase in the quality of patient care. This reduces the workload on healthcare professionals and enables patients to access healthcare services faster and more effectively (31).

However, some important issues should be considered for the effective use of AI in the field of health. It is of great importance for

physicians to receive the necessary training and adapt to these technologies in order to use AI-supported systems effectively. In addition, ethical and data security issues should be prioritized in the process of integration of AI systems into healthcare services (32).

Ensuring the accuracy of AI-generated content is crucial in maintaining patient safety. This can be achieved by training AI models on high-quality, evidence-based medical data and incorporating clinician oversight or automated cross-checks against clinical guidelines (33). Readability also plays a key role-medical information should be presented in plain language, free of unnecessary jargon, and formatted using readability tools to match the cognitive needs of older users (34). Furthermore, using multimodal formats such as voice narration, icons, and interactive elements can enhance understanding, particularly for individuals with sensory impairments or limited digital literacy (35). Taken together, these strategies highlight the importance of designing AI systems that are not only technically robust but also sensitive to the communication needs of an aging population.

Future Work Areas

The following recommendations should be taken into consideration to increase the effectiveness of the use of AI in geriatric

patient follow-up and to alleviate the workload of physicians:

The integration of AI systems into the health sector should be accelerated and ethical principles should be taken into account in this process.

- 1- The adoption of technology should be encouraged by organizing training programs for physicians on the use of artificial intelligence.
- 2- Stricter legal regulations should be put in place for the security of patient data and the audit mechanisms of these systems should be strengthened.
- 3- Future research should be supported by larger clinical trials to measure the effectiveness of AI in geriatric patient care.

The success of AI-supported systems depends on physicians' effective use of this technology and continuous updating of the systems (36). Health professionals who are accustomed to traditional medical approaches may have some reservations about adopting AI technologies. Therefore, it is important for health managers and policy makers to provide in-service trainings for physicians to adopt AI systems more easily (37).

In conclusion, the effective use of AI technologies in the healthcare sector has the

potential to increase the quality of patient care while alleviating the workload of physicians. However, the rigorous implementation of ethical and safety standards and the adaptation of healthcare professionals to the technology are critical factors for successful integration.

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