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Nesnelerin interneti ve giyilebilir teknolojinin yaşlı sağlığı üzerindeki etkileri

The Effects of the internet of things and wearable technology on elderly health

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ABSTRACT

The Internet of Things (IoT) is a technology that enables physical objects to communicate with each other and with data collection centres via the internet. The use of IoT in the healthcare sector has great potential, particularly in terms of monitoring and managing the health status of elderly individuals. IoT devices, integrated with big data and artificial intelligence algorithms, enable the provision of personalised healthcare services. In terms of physical health, devices that monitor vital parameters such as heart rate, blood pressure and glucose levels in real time facilitate access to healthcare services and enable early intervention. Security-focused solutions, such as fall detection systems, support the independent living of elderly individuals and reduce risks. In the field of mental health, applications that reduce social isolation and increase emotional well-being reduce the risk of stress and depression in elderly individuals. In chronic disease management, glucose monitoring devices, blood pressure monitors, and medication reminder systems increase individuals' adherence to treatment and reduce the risk of complications. In terms of independent living support, GPS tracking devices and smart home systems enhance the safety of older individuals while facilitating their daily lives. These technologies also improve quality of life by encouraging social participation. In terms of economic benefits, the widespread adoption of early diagnosis and preventive healthcare services reduces the financial burden on healthcare systems. However, the main barriers to the widespread adoption of these technologies include cost, data security, and a lack of digital literacy. Future research and policies should focus on making these technologies user-friendly, increasing their accessibility, and resolving ethical data management issues. In conclusion, IoT and wearable technologies stand out as powerful tools that support the independent living of older individuals, facilitate healthcare services, and improve their quality of life. Within the framework of Health 4.0 and Society 5.0, the potential of these technologies contributes not only to the transformation of individuals but also to that of social healthcare services.

ÖZ

Nesnelerin İnterneti (IoT), fiziksel nesnelerin birbirleriyle ve veri toplama merkezleriyle internet üzerinden iletişim kurmasını sağlayan bir teknolojidir. Sağlık sektöründe IoT kullanımı, özellikle yaşlı bireylerin sağlık durumunun izlenmesi ve yönetilmesi açısından büyük bir potansiyele sahiptir. IoT cihazları, büyük veri ve yapay zeka algoritmalarıyla entegre edilerek kişiselleştirilmiş sağlık hizmetleri sunulmasını mümkün kılar. Fiziksel sağlık açısından, kalp ritmi, kan basıncı ve glikoz seviyeleri gibi hayati parametreleri gerçek zamanlı izleyen cihazlar, sağlık hizmetlerine erişimi kolaylaştırır ve erken müdahale imkanı sunar. Özellikle düşme algılama sistemleri gibi güvenlik odaklı çözümler, yaşlı bireylerin bağımsız yaşamlarını destekler ve riskleri azaltır. Zihinsel sağlık alanında, sosyal izolasyonu azaltan ve duygusal refahı artıran uygulamalar, yaşlı bireylerde stres ve depresyon riskini azaltır. Kronik hastalık yönetiminde, glikoz izleme cihazları, kan basıncı monitörleri ve ilaç hatırlatma sistemleri, bireylerin tedaviye uyumunu artırır ve komplikasyon riskini azaltır. Bağımsız yaşam desteği açısından, GPS izleme cihazları ve akıllı ev sistemleri, yaşlı bireylerin güvenliğini artırırken günlük yaşamlarını kolaylaştırır. Bu teknolojiler, bireylerin sosyal katılımını teşvik ederek yaşam kalitelerini de iyileştirir. Ekonomik faydalar açısından, erken teşhis ve önleyici sağlık hizmetlerinin yaygınlaşması, sağlık sistemleri üzerindeki mali yükü azaltır. Ancak, bu teknolojilerin yaygın olarak benimsenmesinin önündeki en büyük engeller arasında maliyet, veri güvenliği ve dijital okuryazarlık eksikliği bulunmaktadır. Gelecekteki araştırma ve politikalar, bu teknolojileri kullanıcı dostu hale getirmeye, erişilebilirliğini artırmaya ve etik veri yönetimi sorunlarını çözmeye odaklanmalıdır. Sonuç olarak, IoT ve giyilebilir teknolojiler, yaşlı bireylerin bağımsız yaşamlarını destekleyen, sağlık hizmetlerini kolaylaştıran ve yaşam kalitelerini artıran güçlü bir araç olarak öne çıkmaktadır. Sağlık 4.0 ve Toplum 5.0 çerçevesinde, bu teknolojilerin potansiyeli sadece bireylerin değil, aynı zamanda sosyal sağlık hizmetlerinin de dönüşümüne katkıda bulunmaktadır.

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INTRODUCTION

Global Aging and Demographic Changes

The increase in the elderly population around the world has significant effects on health systems and social structures. According to the United Nations' 2023 report, elderly individuals will constitute 22% of the world's population in 2050 (1). The increase in the elderly population is explained by the decline in birth rates and the increase in life expectancy. While this situation has increased the demand for health services, it has necessitated innovative approaches to ensure the continuity of existing health systems.

Elderly individuals often face more than one chronic disease. The prevalence of diseases such as diabetes, hypertension, heart diseases and Alzheimer's is higher in the elderly population. While the management of these diseases requires a multidisciplinary approach, the innovations offered by technology in this field have a great potential to improve the quality of life of elderly individuals.

What is IoT?

The Internet of Things (IoT) is an ecosystem of technologies that enables physical objects, devices, sensors, and software to connect and exchange data with each other over the internet. IoT refers to a structure in which devices can not only collect data, but also analyze this data and turn it into action (2). This technology is used in a wide range of applications today, from smart homes to industrial automation, from agriculture to healthcare.

One of the key functions of IoT is to provide real-time information flow by integrating the physical world into the digital world. This creates a network where devices are in constant communication, making processes more efficient and effective. For example, an IoT device can collect an individual's health data, transmitting that data to a healthcare professional and sending emergency alerts as needed. Such practices have an important place in the health management of elderly individuals.

IoT usually works with a structure consisting of sensors, data processing units, and network connectivity. As sensors collect data from the physical environment, this data is analyzed by processing units and converted into meaningful information. Then, this information is transferred to the user or relevant professionals via cloud-based systems. This process makes it easier for users to make informed decisions in many areas such as health, safety, energy consumption, etc. (3).

The applications of IoT in the healthcare sector allow for monitoring the health status of individuals in real-time. For example, IoT devices can continuously measure vital signs such as heart rhythm, blood pressure, glucose level, and transmit this information to both the user and healthcare professionals. In addition, fall detection sensors offer a critical safety mechanism for older individuals. Thus, IoT enables individuals to not only monitor their health but also be able to take quick action in emergencies (4).

The proliferation of IoT is transforming not only individual users but also healthcare systems. IoT-based systems are integrated with big data analytics, making it possible to personalize healthcare. This allows for the creation of custom treatment plans based on individuals' health history. In addition, the use of IoT devices in regions with limited access to healthcare services can contribute to reducing health inequalities.

For example, individuals living in rural areas can benefit from basic healthcare services thanks to IoT devices, and health problems can be detected at an early stage (5).

The future potential of IoT lies in its integration with technologies such as artificial intelligence and machine learning. This integration allows for more accurate analysis of health data and the development of predictive models. As a result, IoT stands out as a technology that both increases the quality of life of individuals and improves the effectiveness of health systems in the health sector.

Transformation of Digital Technologies in the Field of Health

The rapid development of digital technologies in the century has started a new era in the field of health. IoT has emerged as a critical component of this technological revolution. IoT allows devices to connect and exchange data with each other over the internet, providing innovative solutions in the monitoring, early diagnosis, and treatment of diseases in healthcare (2). The use of IoT in the healthcare sector provides significant advantages in terms of instant monitoring of patient data, predicting diseases with big data analytics, and increasing access to healthcare services (4).

The use of digital technologies in the field of health makes it possible not only to monitor the health data of individuals, but also to develop personalized treatment processes by analyzing these data by artificial intelligence-supported systems. For example, artificial intelligence algorithms can predict the progression of a particular disease by analyzing large data sets, thus contributing to the creation of a more effective treatment plan (5). In this context, the Health 4.0 concept combines technologies such as IoT, big data, artificial intelligence, and cloud computing, providing the opportunity to continuously evaluate the health status of patients and determine the most appropriate treatment methods (2). While this process increases patient safety, it also eases the workload of healthcare professionals (6).

Especially for elderly individuals, such solutions both improve the quality of life and ease the burden on health systems. For example, IoT-based wearable technologies can continuously monitor the health status of elderly individuals, instantly detect critical changes and alert healthcare professionals when necessary (3). Wearable devices monitor individuals' mobility, heart rates, blood pressures, and other vital indicators, allowing for a proactive approach to healthcare (4).

The integration of IoT into the healthcare industry also plays an important role in disease management and preventive healthcare. For example, wearable devices developed for elderly individuals with chronic diseases help prevent serious complications thanks to continuous monitoring and early warning mechanisms (3). In addition, IoT-based remote monitoring systems offer an important solution for individuals living in areas with limited access to healthcare. These systems reduce dependency on healthcare institutions by facilitating patient follow-up and contribute to making healthcare services more accessible (7).

The transformation of digital technologies in healthcare not only improves the health status of individuals, but also contributes to the more efficient operation of health systems. For example, real-time data analytics provides healthcare professionals with the opportunity to make fast and accurate decisions and enables more

efficient use of resources. The use of artificial intelligence-supported systems in the decision-making processes of healthcare professionals accelerates the diagnosis and treatment processes, thus reducing the costs of healthcare (6).

This situation is of critical importance for the sustainability of health services, especially in today's world where the elderly population is increasing rapidly. With the increase in the elderly population around the world, the management of chronic diseases is becoming an increasingly large burden. IoT-based solutions offer significant opportunities to alleviate this pressure on healthcare systems (8).

In addition, the integration of digital technologies into the daily lives of individuals positively affects not only physical health but also mental and social health. For example, digital platforms and applications designed to prevent social isolation help older people strengthen their social connections and increase their emotional well-being. In particular, AI-powered virtual assistants and smart home systems support elderly individuals to live independently by facilitating their daily lives (9).

Wearable Technologies and IoT Integration

Wearable technologies have become one of the most common applications of IoT in the healthcare industry. These technologies allow individuals to monitor their health data in real-time, while providing healthcare professionals with the ability to make faster and more accurate diagnoses. Wearable products such as smartwatches, fitness trackers, medical sensors, and even implantable devices make great contributions to health management by continuously monitoring individuals' biometric data (3).

Wearable devices allow users to track key health indicators such as heart rhythm, blood pressure, oxygen saturation, and sleep patterns. For example, continuous glucose monitoring devices help diabetics optimize their blood sugar levels, while fall detection sensors enable older individuals to receive quick response in emergencies. These devices not only improve the health status of individuals but also reduce the burden on healthcare systems. In addition, digital biosensors continuously monitor the general health status of patients by monitoring body temperature and respiratory rate (10).

Wearable technologies increase the independence of older individuals, allowing them to live more safely. For example, GPS trackers developed for Alzheimer's patients ensure patient safety while at the same time relieving the burden on family members and healthcare professionals. In addition, devices used in chronic disease management increase the quality of life of individuals with functions such as reminding the use of medication, encouraging regular exercise, and monitoring the diet pattern (11).

The integration of wearable technologies with IoT makes it possible to store and analyze data in cloud-based systems. In this way, health data becomes accessible to both individuals and healthcare professionals. For example, irregularities in an individual's heart rhythm can be detected by IoT-powered devices and transmitted to healthcare professionals, thus enabling early intervention (9). Furthermore, these technologies support the creation of tailored treatment plans based on individuals' health history, paving the way for personalized healthcare (8).

The growing popularity of wearable devices also contributes to reducing inequalities in

access to healthcare. Especially in rural areas or where access to healthcare is limited, these devices monitor the health status of individuals, helping to prevent serious health problems. This creates a positive impact on health systems, while improving the quality of life of individuals and improving health outcomes. In addition, with the development of textile-based sensors, health monitoring has been made more natural by increasing the comfort of patients thanks to smart fabrics integrated into clothing (10).

Health 4.0 and Society 5.0 Concepts

Health 4.0 is a paradigm that expresses the digital transformation of healthcare, where innovative technologies such as IoT, artificial intelligence, big data and cloud computing are integrated. Health 4.0 provides more effective and personalized health solutions by providing the ability to monitor and manage the health status of individuals in real time (5). This paradigm not only improves individual health management but also contributes to the sustainability of health systems.

Society 5.0 is a technology-driven model of society and encourages individuals to use technology in a more inclusive way. This approach aims to make health technologies accessible and usable for everyone, including older individuals. Increasing the access of elderly individuals to digital technologies and making it possible for them to benefit from these technologies is one of the main objectives of Society 5.0 (3).

The integration of the concepts of Health 4.0 and Society 5.0 enables the expansion of health services to address not only individual needs but also societal problems. For example, a Society 5.0 approach supported by digital health technologies can reduce health inequalities and increase access to healthcare for individuals in rural areas. In addition, thanks to this integration, more effective solutions can be offered in areas such as the prevention and management of chronic diseases.

Health 4.0 and Society 5.0 have gained more importance with the widespread use of artificial intelligence-supported decision support systems and IoT-based health devices. For example, smart home systems designed for elderly individuals can both monitor their health status and increase their safety. These systems are equipped with features such as fall detection sensors, smart medication reminders, and emergency call mechanisms.

Furthermore, Society 5.0 encourages the use of technology not only as a tool but as a solution that improves the quality of life of individuals. In this context, factors such as the accessibility of health technologies, increasing digital literacy, and reducing economic barriers are critical in achieving this goal. For example, the development of low-cost and easy-to-use wearable devices could make it possible for a larger elderly population to take advantage of these technologies.

MATERIALS AND METHODS

Data Collection Process

In this study, academic articles published between 2017 and 2024 were screened. Data were obtained from PubMed, Scopus, Web of Science, and Google Scholar databases. The keywords 'Internet of Things (IoT)', 'Wearable Technology', and 'Geriatric Health' were used during the search. As a result of the search strategy, a total of 515 sources were initially identified. After removing duplicate records (those appearing in different databases), the titles and abstracts of 365 publications were reviewed. After excluding studies not directly

related to the topic, 88 publications were evaluated for full-text review, and 20 studies (research articles, reviews, and reports) that met the criteria were included in the analysis The selection of studies was based on the following criteria.

Inclusion Criteria:

- Published between 2017 and 2024.
- Addressing the effects, opportunities, or challenges of IoT and wearable technologies in the health management of older individuals.
- Study type: research articles, systematic reviews, case reports, or academic studies presenting a theoretical framework.
- Publications in English or Turkish with full text access.

Exclusion Criteria:

- Studies containing only abstract information or without full text access.
- Publications lacking scientific basis, containing personal opinions or magazine content.
- Studies focusing on age groups other than elderly health and not related to geriatric processes.
- Duplicate publications.
- Purely technical papers lacking healthcare context.

Evaluation Method

The collected data were evaluated by thematic analysis method. In this process, the effects of IoT and wearable technologies on the health status, quality of life and independent life of elderly individuals were analyzed. In addition, the impact of the COVID-19 pandemic on the adoption of these technologies was examined.

RESULTS

Effects of Wearable Technology on Elderly Health

Wearable technologies have played a groundbreaking role in the health management of elderly individuals and have made significant contributions to improving their quality of life. These technologies allow older individuals to monitor and manage both their physical and mental health. These effects are discussed in detail below.

Effects on Physical Health

Wearable technologies play a critical role in the management of the physical health of older individuals. These devices provide real-time monitoring of vital signs, contributing to the early diagnosis and prevention of diseases. Regular monitoring of vital parameters such as heart rhythm, blood pressure and oxygen saturation ensures that the general health status of elderly individuals is kept under control (7).

Continuous glucose monitoring devices allow diabetics to monitor their blood sugar levels on a regular basis, while helping to prevent serious complications by providing alerts in case of sudden drops or spikes in blood sugar. These devices allow users to manage their own health in a more informed manner, while also supporting healthcare professionals to make accurate diagnosis and treatment plans (2).

Fall detection sensors, on the other hand, are used as an important tool to increase the safety of elderly individuals. Falls are a common problem in older individuals and can lead to serious injuries and loss of independence. Fall detection systems equipped with wearable devices provide rapid intervention by sending instant warnings to relatives or emergency service teams in the

event of a fall. Such systems are a critical support mechanism for older individuals to maintain independent lives (9).

In addition, physical activity monitoring devices help older individuals adopt a healthier lifestyle by tracking their daily movements and exercise levels. These devices encourage individuals to engage in regular physical activity, supporting the maintenance of muscle strength and increasing balance and flexibility. For example, pedometer-enabled devices help users keep track of their daily goals and increase their physical activity (12).

Wearable technologies also contribute to improving the rest quality of elderly individuals by monitoring sleep patterns. Sleep trackers help individuals develop better sleep habits by recording data such as sleep duration, sleep depth, and frequency of awakening. Sleep disorders, which are especially common in elderly individuals, can be detected at an early stage thanks to these devices and necessary precautions can be taken (10).

In conclusion, wearable technologies provide versatile solutions for the management of their physical health, allowing older individuals to lead a healthier and more independent life. The use of these devices not only improves individual health management but also reduces the burden on healthcare systems. The proliferation of IoT-supported wearable technologies facilitates access to healthcare, increasing the quality of life of individuals and improving overall health outcomes (11).

Effects on Mental and Emotional Health

Wearable technologies not only support physical health, but also offer solutions to improve the mental and emotional well-being of older individuals. Social isolation is a common problem in older individuals, and it can lead to depression, anxiety, and other mental health problems. Wearables offer features designed to strengthen individuals' social connections. For example, smartwatches and mobile apps allow older individuals to communicate with family and friends on a regular basis (9).

Devices that work integrated with meditation and stress management applications help improve the mental health of elderly individuals. These devices encourage individuals to perform relaxation exercises by monitoring their stress levels. For example, devices that track heart rhythm and breathing patterns guide individuals in stressful situations, allowing them to calm down faster. Such technologies offer emotional support, especially for older individuals living alone (3).

In addition to these, wearable devices are also used to support the memory and cognitive functions of elderly individuals. Special devices developed for individuals with diseases such as Alzheimer's or dementia contribute to the protection of individuals to maintain their independence by providing daily reminders and guidance. For example, smart devices that remind the time to take medication increase the compliance of individuals with treatment and prevent health problems caused by forgetfulness.

Another feature that reinforces the link between mental health and social interaction is wearable technologies that encourage participation in group activities. These devices allow individuals to share their physical activity with their friends and increase their motivation in this way. For example, a pedometer app creates an environment of competition with the social environment of older individuals, encouraging physical activity and increasing their social interactions.

Role in Chronic Disease Management

Chronic diseases are common among elderly individuals and are an important problem that reduces the quality of life and increases the demand for health services. Wearable technologies provide great convenience for individuals and health professionals in the management of these diseases. These devices allow individuals to continuously monitor the symptoms of their chronic illness and transmit this data to their healthcare team (8). For example, continuous glucose monitoring devices help diabetics keep track of their blood sugar levels on a regular basis. These devices warn individuals and healthcare teams in case of sudden drops or rises in blood sugar, preventing serious complications. Similarly, blood pressure monitors help individuals stay in control of their health status by constantly monitoring the blood pressure levels of hypertension patients (13).

Wearable devices designed for heart diseases regularly monitor individuals' heart rhythm and other cardiovascular parameters. For example, wearable ECG devices that can detect irregular heartbeats provide instant information to healthcare professionals, allowing the necessary interventions to be made in a timely manner. These devices are especially vital for older individuals at risk of heart failure (12).

In addition, devices designed for individuals with respiratory diseases such as asthma and COPD monitor the respiratory functions of individuals and provide warnings about triggers by measuring air quality. Such devices facilitate the disease management of individuals and help prevent acute attacks (6).

Wearable technologies provide benefits in chronic disease management not only at the individual level, but also at the level of health systems. These devices are integrated with big data analytics, contributing to the monitoring of disease trends and the development of public health policies. In addition, it reduces the demand for health services and eases the burden on health systems by increasing the adherence of individuals to treatment (8).

Supporting Independent Living

Wearable technologies offer a variety of features that support older individuals to lead independent lives. These devices help individuals maintain their independence by increasing their safety and facilitating their daily lives. GPS tracking devices, in particular, are vital for individuals with cognitive disorders such as Alzheimer's and dementia. These devices track the location of individuals in real time, minimizing the risk of disappearance and providing reassurance to family members (3).

In addition, wearable devices that work integrated with smart home systems allow elderly individuals to live more safely in the home environment. For example, motion detection sensors can prevent potential accidents by monitoring the daily activities of individuals. These sensors, which work integrated with automatic lighting systems at night, reduce the risk of falling and allow individuals to move more comfortably around the house.

Emergency call systems are another important feature that supports the independent living of older individuals. These systems allow individuals to reach their healthcare team or loved ones at the push of a button. Especially for elderly individuals living alone, such systems create a sense of security and offer rapid intervention in emergencies.

Devices that encourage physical activity also support independent living. Pedometers and motion trackers help elderly individuals increase their physical activity, contributing to both their physical health and maintaining their independence. These devices allow individuals to improve muscle strength and balance abilities.

As a result, wearable technologies support the independent lives of elderly individuals, facilitating their daily lives and increasing their safety. These devices not only improve the quality of life of individuals, but also provide important support for family members and caregivers.

Economic and Social Benefits

Wearable technologies offer innovative solutions that have the potential to reduce healthcare costs and increase social inclusion. These devices support preventive health services, easing the burden on health systems and improving the quality of life of individuals. For example, thanks to early detection and preventive measures, hospitalizations are reduced and long-term healthcare costs are significantly reduced (8).

From an economic point of view, the fact that wearable technologies reduce the dependence of individuals on health services contributes to making health services more sustainable. For example, regular health monitoring devices allow individuals to manage their own health, reducing the demand on healthcare professionals. This presents a great advantage, especially in rural areas or areas where access to healthcare is limited (13).

In terms of social benefits, wearable devices increase the participation of elderly individuals in social life. Devices that encourage physical activity increase participation in social activities by directing individuals to a more active lifestyle. In addition, mobile apps and communication tools designed to reduce social isolation allow older individuals to communicate with family and friends more frequently. This contributes to increased emotional well-being and reduced feelings of loneliness (11).

Wearable technologies also contribute to public health by making it easier for individuals to share their health data. Big data collected through these devices allows for the development of health policies and more effective management of health systems. For example, during pandemics or regional health issues, data collected through wearable devices can facilitate crisis management by providing quick and accurate information to health authorities (6). In addition, health monitoring with wearable sensors contributes to the development of personalized interventions for chronic diseases, helping to improve strategies for public health (7).

Facilitating Patient Follow-up

Another important advantage of wearable technologies is that they make it easier to monitor the health status of older individuals and stay in constant contact with healthcare professionals. Patient follow-up plays a critical role in increasing adherence to treatment and preventing complications, especially in individuals with chronic diseases. For example, IoT-based wearable devices can regularly record and analyze individuals' vital signs and send notifications to healthcare teams in abnormal situations (14).

Continuous glucose meters, blood pressure monitors and wearable ECG devices allow detailed monitoring of the health status of individuals even in a home environment.

These devices not only monitor the health status of the individual but also support the treatment process by transmitting this information to healthcare professionals in real-time. For example, the ECG data of an individual at risk of heart failure can be regularly transmitted to the health center to ensure early detection of situations that require urgent intervention (15).

In addition, smart medication reminder devices increase compliance with treatment by enabling elderly individuals to take their medications on time. Such technologies are vital, especially in cases where the use of multiple drugs is required. In addition, these devices minimize the negative consequences that may occur due to the misuse of drugs (16).

Another innovation that facilitates patient follow-up is wearable devices that work integrated with telehealth applications. Thanks to these devices, healthcare professionals can remotely monitor the health status of individuals, provide counseling services when necessary, and update treatment plans. This offers significant advantages in terms of time and cost for both individuals and healthcare providers (17). In addition, these devices provide a great benefit for individuals living in rural areas where access to healthcare is limited. Remote patient monitoring systems reduce dependency on health centers and allow regular follow-up of patients (11).

The contributions of wearable technologies to patient follow-up are not only limited to individual health management, but also contribute to the general monitoring of public health. For example, patient monitoring devices integrated with big data analytics can help shape public health policies. Thanks to epidemiological analyses, the spread of infectious diseases can be tracked faster and health authorities can take more effective measures (18). Such technological advances make disease management proactive and enable health systems to work more efficiently.

DISCUSSION AND CONCLUSİON

In this study, the effects of wearable technologies and IoT applications on the health management of elderly individuals were examined. The findings show that these technologies make significant contributions to the physical, mental and social health of elderly individuals. The real-time monitoring and warning features offered by wearable devices have not only improved the health status of older individuals, but also reduced the burden on health systems.

In particular, its contributions in chronic disease management are remarkable. Devices such as continuous glucose monitoring devices, blood pressure monitors, and fall detection sensors regularly monitor the health data of individuals, providing fast and accurate information to healthcare professionals. While this situation has increased the effectiveness of health services, it has also increased the quality of life of individuals. In addition, technologies that facilitate patient follow-up increase the compliance of individuals with treatment and reduce the risk of complications.

Evaluations on mental and emotional health reveal that wearable technologies play an important role in reducing social isolation and improving the emotional well-being of individuals. In particular, devices that encourage social interactions help elderly individuals to maintain a more active social life. However, in order for these technologies to reach a wider range of users, digital literacy levels need to be increased and economic barriers reduced.

In conclusion, wearable technologies and IoT applications offer innovative solutions that support the independent living of older individuals, facilitate their access to healthcare, and improve their overall quality of life. These devices provide a wide range of benefits from individual health management to social health policies. However, some challenges need to be overcome in order to adopt these technologies more effectively. In particular, issues such as data security, cost, and user-friendly designs should be the focus of future work.

The findings of this study emphasize the contribution of health technologies to the lives of elderly individuals and reveal the importance of innovative approaches in this field. Future research should develop solutions for the broader and more effective application of these technologies.

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