# The Use of Artificial Intelligence in Physiotherapy, Advantages and Disadvantages: Literature Review

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**Abstract**

Artificial intelligence (AI) is known as technology, computer, and machine learning based systems that produce solutions to problems that human intelligence cannot overcome. Apart from the military industry, science, and engineering, it is seen that the use of AI in different fields of health sciences is becoming increasingly widespread. There are scientific studies on AI in many health fields from orthopedics to neurology, radiology to cardiology, endocrinology to physiotherapy. Web-based systems such as wearable devices, robots, systems created with virtual reality, mobile applications, specially developed designs, gait analysis systems, tele-rehabilitation are AI-supported technologies widely used in physiotherapy services in treatment and diagnosis, evaluation, patient care and follow-up. Despite its benefits, there are also some disadvantages of AI. We think that these disadvantages are the most important reasons why qualified studies on AI in our country have not reached the required level. We believe that increasing the number of qualified personnel in the field of artificial intelligence, allocating more resources to the sector, revising the curriculum according to the developing technology, integration of information systems and health services will increase awareness of AI. We think that with the elimination of the difficulties encountered towards AI, AI-supported technologies will become widespread in the provision of physiotherapy and rehabilitation services and qualified research will increase.

**Keywords:** Artificial intelligence, awareness, physiotherapy and rehabilitation, advantages, disadvantages.

**Yapay Zekânın Fizyoterapide Kullanımı, Avantajlar ve Dezavantajlar: Literatür İncelemesi**

**Öz**

Yapay zekâ (YZ), insan zekasının üstesinden gelemediği sorunlara çözüm üreten teknoloji, bilgisayar ve makine öğrenimi tabanlı sistemler olarak bilinmektedir. Savunma sanayi, fen ve mühendislik bilimi dışında sağlık bilimlerinin farklı alanlarında da YZ kullanımı giderek yaygınlaşmaktadır. Ortopediden nörolojiye, radyolojiden kardiyolojiye, endokrinolojiden fizyoterapiye kadar birçok sağlık alanında YZ ile ilgili bilimsel çalışmalar yapılmaktadır. Giyilebilir cihazlar, robotlar, sanal gerçeklik ile oluşturulan sistemler, mobil uygulamalar, özel geliştirilmiş tasarımlar, yürüme analiz sistemleri, tele-rehabilitasyon gibi web tabanlı sistemler fizyoterapi hizmetlerinde tedavi ve tanı, değerlendirme, hasta bakımı ve takibinde yaygın olarak kullanılan YZ destekli teknolojilerdir. Faydalarına rağmen, YZ'nin bazı dezavantajları da vardır. Bu dezavantajlar, ülkemizde YZ konusunda nitelikli çalışmaların yetersizliğinde önemli bir unsurdur. Yapay zekâ alanında nitelikli personel sayısının artırılması, sektöre daha fazla kaynak ayrılması, müfredatın gelişen teknolojiye göre yenilenmesi, bilişim sistemleri ile sağlık hizmetlerinin entegrasyonunun YZ konusunda farkındalığı artıracağına inanıyoruz. Yapay zekaya yönelik karşılaşılan zorlukların ortadan kalkması ile

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fizyoterapi ve rehabilitasyon hizmetlerinin sunumunda YZ destekli teknolojilerin yaygınlaşacağını ve nitelikli araştırmaların artacağını düşünüyoruz.

**Anahtar Sözcükler:** Yapay zekâ, farkındalık, fizyoterapi ve rehabilitasyon, avantajlar, dezavantajlar.

## Introduction

Considering today's technological developments, the use of artificial intelligence (AI) has started to make itself felt in the field of health as in every area[1,2]. It is possible to say that we use and spend time with AI-supported devices in our lives without being aware of it. It is seen that structures such as smartphones, tablets, smartwatches, computers, cars, avenues and streets, and even smarthomes, where we spend a considerable amount of time, are equipped with AI-supported technologies and made available to society[3,4].

Health is a dynamic sector that is open to development. Therefore, it is unavoidable to be affected by the advantages and disadvantages of AI. Another issue that we are not aware of is that AI has been used in healthcare services for a long time[5,6]. Some evaluation methods used in the diagnosis and diagnosis of health services, tele-health etc. applications, which are described as telehealth services, wearable technologies, robot mannequins used in institutions providing health education, tools used in the cleaning of the health facility, elevators offered to the public in the facility, smart toilets can be listed as services supported by AI Technologies[7-14]. The results of a recent study on the use of AI in physiotherapy are noteworthy. This study highlighted significant gaps in physiotherapists' adoption of AI, emphasizing the need to increase awareness of AI in physiotherapy, improve access to AI, and enhance AI policies[15].

Physiotherapy practices also have an important position in health services. It should be known that associating technological developments, which are in a rapid increasing trend, with physiotherapy will contribute to the provision of better quality health care, increasing patient satisfaction and treatment effectiveness. This literature review aims to systematically examine the current applications of AI in physiotherapy, highlight its advantages and disadvantages, identify gaps in the literature, and guide future research. This study provides physiotherapists with insights into topics such as the areas of use of AI in physiotherapy science, AI awareness among physiotherapists, the advantages and disadvantages offered by AI, and AI in the physiotherapy curriculum.

This review is designed as a traditional review. Traditional compilations provide a comprehensive, critical, and objective analysis of a subject. The subject is discussed within a theoretical framework, and attempts are made to identify gaps or inconsistencies in the underlying knowledge. The literature is summarized, and conclusions are drawn about the subject under review, offering readers a different perspective and highlighting important areas of research related to the subject[16-18].The researcher conducted a literature review between June and November 2025 using the Google Scholar database, searching for the terms "artificial intelligence", "artificial intelligence in healthcare", "artificial intelligence in physiotherapy", "advantages of



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artificial intelligence" and "disadvantages of artificial intelligence" and "artificial intelligence in physiotherapy education."

## Artificial Intelligence and Machine Learning

Although AI has recently begun to rise in popularity, the first studies in this field were conducted in the 1960s. At that time, AI was used to support diagnosis and treatment in specialized fields such as public health and medicine[5]. In 1982, a textbook on AI was published that specifically offers physiotherapists the opportunity to evaluate biomechanics[6].

Artificial intelligence is computer systems that specialize and come together to solve problems that the human brain cannot solve[19]. It is also described by scientists as "thinking machines" because it performs the tasks of human intelligence[20]. Today, AI has become an attractive multidisciplinary area of study that uses computational, statistical, logical, mechanical, and biological concepts and tools to explain, model and reproduce information and cognitive processes[21].

Machine learning (ML), which facilitates decision-making using data sets and enables making predictions based on patient data, forms a sub-parameter of AI[22,23]. It can be said that the developments in the development and effectiveness of rehabilitation strategies with the integration of ML into physiotherapy are promising. Studies have emphasized that ML has the capacity to maximize the effectiveness, applicability, patient-oriented approach, and efficiency of clinical studies[24,25]. Studies using AI techniques, including not only ML but also natural language processing, computer vision, and robotic infrastructures, have reported that AI increases the percentage of accuracy in the diagnosis of diseases, offers the opportunity to design treatment specific to the individual and predict post-treatment improvements[26,27]. The evolving healthcare sector has also made advances in computer science essential. Therefore, it has been reported that developments such as information and communication systems, sensors, ML and AI can be used to overcome the challenges faced in the healthcare sector[28].

Artificial intelligence is not a stand-alone system. We can see that understanding the outputs of AI requires learning the working mechanism of machines. For this reason, the trainings to be given in health institutions by a well-equipped and professional team about what the infrastructures that make up the AI systems consist of, how they work and how they are interpreted will be able to eliminate doubts in the interpretation of AI. We think that the development of a well-equipped health team in this field will be extremely important in the dissemination of the use of AI by health professionals.

## Use of Artificial Intelligence in Physiotherapy

Physiotherapy is another delivery of health services. Physiotherapy represents a professional group that is pregnant with radical changes today and in the future with the integration of advanced technologies, especially AI applications[29-31]. Therefore, as in all areas of the health services, AI has gained an important place in the use of physiotherapy



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and rehabilitation services[32]. It is seen that the advantages of robot use are utilized in physiotherapy practices in order to increase patient outcomes and efficiency in the rehabilitation process[33]. Scientists have emphasized the importance of using AI in physiotherapy to accelerate rapid progress and recovery at every stage after stroke in the treatment of motor disorders. It is known that robots improve the patient's motor control, enhance existing functions, and provide sensory input. It has been noted that this gives the patient a subjective sense of progress[34]. Robot-assisted therapies go beyond providing sensory and motor feedback; they are adaptable to the individual's needs and highly repeatable compared to traditional treatment approaches. Thanks to visual, auditory, and tactile feedback, they make significant contributions to the patient's progress[35]. Robot-assisted gait training allows treatment periods to be spent more efficiently. Although it is known that robots lack the necessary notifications in patient evaluation, it has been stated that gait rehabilitation will be more enjoyable for patients thanks to robots, thus increasing the effectiveness of treatment[36]. Electromechanically assisted robots provide the advantage of practicing without a physiotherapist, which allows for a higher number of repetitions[37]. Dextrous (soft robot) hands are used in the treatment of musculoskeletal injuries to provide simple mobilization; however, the long-term effects of these systems are a matter of debate[38].

Using computer-based clinical support systems, it may be possible to detect neuropathy and neuropathy-related pain and kinesiophobic behaviors of diabetic patients. It is thought that these AI-related systems will be beneficial in terms of exercise planning in diabetic patients and the sustainability and follow-up of the exercise prescription created[39]. On the contrary, while it was previously reported that AI was among the predictors of rehabilitation services, patients' compliance with exercise was found to be poor[40]. AI has been used in the treatment of common musculoskeletal pathologies such as neck and back pain in order to monitor and improve exercise adherence of patients[41].

Studies investigating the mutual effectiveness of AI and traditional physiotherapy and rehabilitation methods are found in the literature. Traditional physiotherapy and AI digitally assisted treatment sessions were compared in patients after total knee arthroplasty surgery. AI-based digital sessions were tracked with 3D motion sensors through a mobile application and a web-based website. As a result of the study, it was determined that digital intervention was effective in reducing the workload of the physiotherapist and showed a high level of improvement in increasing the functionality of the patients. The same study found that digital sessions could be effective in improving clinical outcomes in the short and medium term at the end of 8 weeks[42]. In the treatment and management of stroke, some treatment guidelines recommend the use of AI rehabilitation in addition to conventional treatment[43].

Technology-based applications such as mobile health (M-Health) enable physiotherapy services such as joint range of motion, posture analysis, exercise training, and monitoring[44]. It is stated that the satisfaction rates of individuals using such applications are high[45]. Similarly, physiotherapists also support physiotherapy services provided with M-health applications[46]. Artificial intelligence-supported “ChatBot” applications



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improve patients' cognitive functions, thereby increasing treatment sustainability and compliance[31].

Another value application where AI is used in the field of physiotherapy is tele-rehabilitation or digital health systems. The use of telerehabilitation applications has increased during extraordinary periods such as the pandemic. However, it continues to exist as an area in need of further development. Therefore, it has been emphasized that it is extremely important to provide more comprehensive applications that can appeal to a wider audience and the necessary technical infrastructure in this field[13]. Today, tele-rehabilitation and home physiotherapy are successfully used to provide real-time monitoring and advice by the therapist remotely. Tele-rehabilitation services, which are expected to become even more important in the future, help patients to move and patients can be guided verbally by physiotherapists during movement[14]. Tele-rehabilitation is applied in physiotherapy and rehabilitation practices with the integration of AI technology and telecommunication systems with effective communication of counseling, preventive physiotherapy, diagnosis and treatment services to patients. Perhaps one of the most important advantages of tele-rehabilitation is that it provides a solution to the accessibility problem for individuals to receive physiotherapy services[13,47]. However, virtual reality and web-based applications are also one of the approaches used in classical physiotherapy. With these applications, motor, sensory and cognitive gains are offered to patients through fun and task-based applications that provide a large number of repetitions, feedback, active participation, guidance and motivation[48]. We think that AI will contribute to making the gains permanent by integrating physiotherapy, personalized cognitive behavioral therapy and virtual reality applications into their treatments in a sensitive way.

The advantages and disadvantages of AI in physiotherapy and rehabilitation have been supported by studies. It is seen that some AI-oriented simulation devices are used in physiotherapy not only to provide the care and support that patients need but also to persuade patients to move. However, it is stated that such designs minimize the workload of physiotherapists and reach more patients[49]. Clinical convenience for physiotherapists in their field of work based on the morphological and anthropological characteristics of the person, genetic predisposition, dietary habits, and living standards of the population. For example, it may be possible to obtain answers to questions such as why back pain is more common or why osteoarthritis is more frequently seen in a specific population using an AI-based “predictive learning model”. This provides an opportunity to make predictions based on cause-and-effect relationships[14]. In a study conducted in India, an AI-supported design was developed by a physiotherapist to predict the recovery process after a stroke. The system was able to predict the duration of the patient's hospitalization, the duration of the stroke, how long the patient could recover after the stroke according to the Barthel index score and the degree of recovery[50]. A recent systematic analysis concluded that the inconsistency of the effects of AI-supported rehabilitation services in the clinic, technological literacy level, doubts about the reliability of AI, and user fatigue are barriers to implementation. On the other hand, the same study emphasized that AI has positive effects such as providing access to more patients, enabling remote



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monitoring of patients, and reducing physiotherapist workload[51]. Several recent studies have also shown that AI facilitates physiotherapist work and tasks, improves performance, and is effective in treating more patients and seeing patient outcomes[30,52]. It has been found that AI can offer significant advantages in determining disease level and treatment efficacy in clinical decision-making process[53,54]. In one study, it was determined that the use of AI in the treatment of distal end fractures of the radius did not have a sufficient level of evidence to guide physiotherapists[55]. A 2018 meta-analysis also revealed that the importance of AI-assisted therapies compared to other clinical treatment modalities is unclear[37].

## Disadvantages of Artificial Intelligence

In the literature, it is seen that there may be some negative situations and disadvantages besides the convenience that AI will provide in health sciences. Today, it is thought that technologies developed with AI will affect the person's life in the future in terms of educational, social, economic and legal aspects[56]. It is reported that AI should be sensitive to cultural and social differences and that the data entry system and algorithms used are not sufficiently understood. It is also emphasized that the options that AI puts forward or the mechanism that is effective in making this decision is not understandable, so it may be difficult to justify AI decisions. However, the possibility of AI technologies using data sets with bias is another disadvantage[57,58]. Concerns about ethical considerations are a matter of debate in the clinical application of AI. Transfer of responsibility in any adverse situation related to AI applications is considered a primary ethical issue[59]. It is unclear how and in what step-by-step manner AI achieves its outputs. We know that physiotherapists using AI should be able to articulate, explain and defend their practice without raising doubts in clinical decision-making. Therefore, it becomes extremely important that AI technologies are designed in more explainable and understandable ways[60].

It is known that it is necessary to interact with AI-based programs in a collaborative way. Therefore, computational literacy is also needed to learn the engineering language related to computer technologies and to interact with machines. Otherwise, it is stated that in the future, paramedics will not be able to go beyond a health technician who only fulfills the commands of AI[61,62]. Therefore, learning the language of AI is essential to be able to interpret the decisions it makes. Because if AI is not understood, the possible errors that AI may exhibit in decision making and the fact that these errors may have serious consequences for patients should also be considered. Taking the right steps to improve the accuracy and reliability of AI-based systems is therefore extremely important[63]. The fact that the participation of physiotherapists in conversations about AI in clinical practice is important should be recognized. Otherwise, physiotherapists will not be able to go beyond being managed by machine intelligence in the decision-making process and will run the risk of being subject to AI unless they learn how AI Works[30]. Physiotherapists should be eager to understand AI technologies as they are in every field, and we should adopt and adapt ourselves to AI-related technology and data related literacy[23].



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Besides the fact that AI is humanoid and lacks empathy, these vehicles are very expensive devices. Their use therefore requires advanced training[64]. It should be known that healthcare organizations trying to integrate AI into their hospitals may need large expenditures and financial support for staff training and that trainings may require continuity. It is also considered that the use of AI may be limited to health facilities with large budgets and may create inequality in the allocation of resources[65]. Another worrying situation in AI is the fear that with the adoption of AI, physicians will be disabled in medical practices and will be managed by computers[66].

The advantages and disadvantages of AI in health sciences are listed as follows (Table 1)[65,67-70].

**Table 1.** The advantages and disadvantages of artificial intelligence in healthcare

| | **Advantages** | **Disadvantages** |
|---|---|---|
| **1** | High-level data storage capability | The idea that it will reduce the need for healthcare workers |
| **2** | Assist in analysis and interpretation | Concern that they will replace healthcare workers |
| **3** | Helping with rapid diagnosis, early diagnosis, and diagnostic accuracy | Fear and anxiety about complex tasks |
| **4** | Facilitating access to healthcare (telemedicine, etc.) | Lack of empathy |
| **5** | Reducing the workload | The high cost of artificial intelligences-based tools |
| **6** | Wearable devices enable continuous monitoring and observation of patients | Requiring advanced training for its use |
| **7** | Offering an alternative form of support for those living in peripheral regions | High cost and the need for trained personnel |
| **8** | Providing personalized care and rehabilitation support by comparing data | Challenges encountered in staff training and the sustainability of training |
| **9** | Increasing patient compliance with treatment in the clinical decision-making process | Requires high budget and resource allocation |
| **10** | Monitoring and reviewing the suitability of treatment plans based on feedback | Challenges encountered in clinical practice due to concerns such as ethics, patient privacy, and confidentiality |
| **11** | Improving communication between clinicians and patients | Concerns about data collection, social issues, and the threat of cyberattacks |
| **12** | Improving patient satisfaction | Concerns regarding the development of algorithms, data bias, and accountability |
| **13** | Assessing the patient's physical condition and recommending appropriate exercises for the patient | Overconfidence due to widespread use |
| **14** | Saving on healthcare resources by optimizing time and costs | The risk of a decline in the focus on human clinical assessments |

It is understood that AI applications may raise concerns about the principles of privacy and confidentiality in the storage of data. It is necessary to learn the systems that make



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up artificial intelligence, to disseminate machine learning, and to create a mechanism to question the results of artificial intelligence. It should not be forgotten that when applying the decisions of artificial intelligence, it should be acted critically and cognitively, possible damages can be minimized and risks can be reduced.

## Awareness and Views on Artificial Intelligence in Healthcare Professionals and Physiotherapists

The attitudes and behaviors of healthcare professionals towards AI in different disciplines have been investigated. According to a 2020 study, it was reported that healthcare providers do not fully understand AI, that AI is not understandable, and that they have an ambivalent attitude and concern about the potential consequences of using AI in clinical practice[71]. In a study conducted in Saudi Arabia, it was reported that 250 healthcare professionals consisting of doctors, nurses and technicians agreed that AI would accelerate healthcare services; however, their knowledge about professional AI was moderate[72]. In another study conducted a year later in Canada, the perceptions of healthcare professionals from different disciplines about AI were investigated, and it was found that the participants had a moderate level of knowledge about the use of AI in medicine[73]. Wong et al. In a study of 59 radiotherapy staff, 91% of respondents were interested in learning more about AI, and their biggest concern was the fear of changing jobs and a major shift in traditional practices[74].

Studies show that physiotherapists have gaps in their knowledge about AI. Although participating physiotherapists appreciated the role of AI technologies and reported their important role in practice, they reported a lack of educational resources related to the integration of AI[75]. Alsobhi et al. recently investigated the opinions of physiotherapists about AI. According to the results of this study, 63.3% of physiotherapists reported that they had not experienced any AI application in their workplace before. In the same study, physiotherapists considered high AI costs and resources as the most important barrier to the acceptance and importance of AI-based applications[76]. In another study conducted in Saudi Arabia with those working in the field of physiotherapy and rehabilitation, the participants were of the opinion that AI would increase productivity, reduce the need for humans, and improve the patient's quality of life[77].

In order to successfully implement physiotherapy and rehabilitation services, our colleagues need knowledge about AI, the possibility of practical application, confidence and acceptance of the use of AI technologies.

## Artificial Intelligence in Physiotherapy Curriculum

Current physiotherapy education is based on rote learning. However, there is now a consensus that the physiotherapy curriculum needs to be updated and renewed according to age; it is emphasized that data, technological and human literacy should be included in the core physiotherapy curriculum[49]. The characterization of physiotherapy as a once-in-a-lifetime undergraduate program should be abandoned. It has become



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essential to transform the curriculum into platforms that provide a lifelong learning model with customizable modules that students need and can access[9].

Physiotherapy education aims to develop skills such as clinical decision-making, problem-solving, and effective communication as well as imparting theoretical knowledge. For this reason, the problem-based learning (PBL) model, which has become increasingly important in recent years, has brought evidence-based and student-centered approaches to the forefront in physiotherapy education[78]. However, the use of PBL may have disadvantages such as the need for technical support staff, time-consuming case creation, and access to information. Therefore, integrating AI-powered tools such as ChatGPT into PBL processes can positively contribute to student performance, learning satisfaction, student participation, and efficient use of time[79,80]. However, it should be noted that the effectiveness of AI-supported educational models on learning outcomes is still uncertain[81].

This comprehensive literature review has some limitations. The study did not focus on a specific area that was examined comprehensively. This is the most important limitation of our study. Another limitation is that the articles were searched using keywords defined in a single database. Another issue is that the articles obtained were not classified in terms of quality.

## Conclusion

It is likely that there will be developments in the provision of health services and physiotherapy science with the technological developments that are in an increasing trend day by day. It is thought that the most important deficiency in qualified AI-based research is the lack of understanding of AI by healthcare professionals and the uncertainties in fully interpreting the results it reveals. This situation may directly negatively affect the trust of healthcare professionals in AI. This study discusses the advantages and disadvantages of AI. We believe that identifying disadvantages and turning them into advantages directly affects AI usage and AI awareness. Therefore, strategies should be developed for the advancement and understanding of AI.

As in healthcare, we need to prioritize certain areas to gain an edge in the field of AI. The first of these may be to increase the number of qualified personnel in AI. The central government and universities can be encouraged to allocate more resources to AI and to open bachelor's or associate's degree programs in AI. We also believe that curriculum changes in line with these developments can raise awareness about AI and make it more understandable.

We think that physiotherapy and rehabilitation services represent a favorable health field in the provision of technologically assisted health services. Therefore, it is inevitable that with the development of AI in physiotherapy science, accessibility to rehabilitation services will make a tremendous contribution to the realization of the treatment period more effectively.



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With the integration of AI into physiotherapy education, future scientists who will care about this field in the coming years are extremely important for young people. With the inclusion of systems associated with technological use in the curriculum, it can be beneficial to understand anatomy, physiology, clinical symptoms, clinical tests, research, therapeutic interventions, and electrical physiotherapy modalities. The use of robotic mannequins in applied courses can improve the practical manual skills of physiotherapy students, reduce student-induced errors, and enable the recognition of incorrect applications. Therefore, physiotherapists should be willing to use AI in clinical practice, be aware of the possibilities offered by AI, and improve their level of knowledge in evaluating the recommendations of AI. The use of easily accessible software such as AI models and GhatGPT should be encouraged in physiotherapy education. AI-supported curriculum updates should be designed in line with the times to develop skills training in addition to theoretical knowledge.

## Future Directions

Developments in technology have clearly increased interest in AI in society and the world of science. As physiotherapists, it is extremely important for our profession to closely follow developments in this field. There is a clear need for high-quality randomized controlled trials, comparative effectiveness studies, and cost-effectiveness analyses related to physiotherapy. We believe there is a need to develop standardized procedures for the use of AI in clinical physiotherapy. The topic of AI in physiotherapy may be an opportunity for young scientists.

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