

ARTIFICIAL INTELLIGENCE IN HEALTH EDUCATION

SAĞLIK EĞİTİMLERİNDE YAPAY ZEKA

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Öz

Yapay zeka (YZ) insan zekanın gerektirdiği yetilere sahip bir bilgisayar bilimi ve mühendisliği alanıdır. YZ'nin önemli kullanım alanlarından birini ise sağlık sektörü oluşturur. Hasta kayıtlarından çok fazla veriyi analiz ederek hızlı tanı ve tedaviye, cerrahiden ilaç üretimine ve nörobilime hava kirliliği epidemiyolojisi, yaşlı bakımı ve izlenmesi gibi toplum sağlığını geliştirme alanlarından; intihara meyil düşünceli risk altındaki bireylerin izlemi gibi çok geniş bir alanda kullanım olanağı sunmaktadır. YZ akıllı uygulamalarıyla sağlık profesyonellerinin eğitim süreçlerinde hasta üzerinde yapılan ilk yardım, resüsitasyon gibi uygulamalar artık daha yoğun olarak yapılmaya başlanmıştır. Bu uygulamalarla eğitimin güçlendirilmesi sağlık eğitimlerinde hasta takip ve bakım hizmetlerieğitiminde YZ uygulamalarıyla öğrencilere daha fazla uygulama imkanı sağlamaktadır. Sanal hastaların tansiyon, nabız, ateş gibi vital bulgu takipleri, sanal damar yolu açma, kan alımı gibi uygulamaları sağlık profesyoneli eğitimlerinde sık kullanılan yöntemler olmaya başlamıştır. Sağlık profesyonellerinin eğitiminde hastaların olası zarar görebilme süreçleri bu sayede en aza indirilmeye çalışılmaktadır.

Anahtar Kelimeler: Eğitim, Sağlık Eğitimi, Yapay zeka.

Abstract

Artificial intelligence (AI) is a field of computer science and engineering with abilities required by human intelligence. One of the most important usage areas of AI is the health sector. From the areas of public health promotion such as air pollution epidemiology, elderly care and monitoring to rapid diagnosis and treatment, from surgery to drug production and neuroscience by analyzing a lot of data from patient records; It offers a wide range of usage opportunities such as monitoring individuals at risk with suicidal tendencies. With AI smart applications, practices such as first aid and resuscitation on patients in the training processes of health professionals have started to be applied more intensively. Strengthening education with these practices provides students with more application opportunities with AI applications in patient follow-up and care services education in health education. Vital signs such as blood pressure, pulse, fever monitoring of virtual patients, virtual vascular access, and blood drawing have become common methods in health-care professional training. In the training of health professionals, the processes of possible harm to the patients are thus tried to be minimized.

Keywords: Education, Health Education, Artificial intelligence.

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Introduction

It is thought that the most important feature that distinguishes humans from other beings is intelligence. Intelligence has been defined by scientists in different ways. Artificial intelligence is a field of computer science defined as the ability of a machine to imitate behaviors that require human intelligence (1,2,3)

The history of artificial intelligence (AI); how human thought came to being, the idea of "Can objects also think like humans?", how to write the algorithm of thought, dates back the documents of Aristotle, who lived between 384 BC and 322 BC. (4,5).

In the 1950s, Alan Mathison Turing was the first to come up with the idea of artificial intelligence. With the rapid increase of knowledge in the field of health, AI started to be used in the 1970s (6,7,8).

The science that focuses on creating machines that can perform tasks that normally requires human intelligence such as visual perception, speech recognition, decision making and translating between languages and that contributes to the theory and development of computer systems is called AI. (9).

Today, AI content is encountered in almost every field. Day after day AI; becomes applications with decreasing costs and increasing performance. The methods used in programs applied in basic education should meet the need for lifelong learning and should respond to professional and current needs (10,11).

Health professionals constitute one of the largest occupational groups in the world. They operate in all areas including administration, clinical, policy, research and education (12). In order to create a safe health system, it is necessary to provide the basic conditions such as a good consultancy service in the education of health professionals in order to create an accountable, skilled and knowledgeable workforce with the right equipment. In order to prepare an accountable, skilled and knowledgeable workforce, education and training are very important. The scope and adequacy of education and training provided to healthcare professionals is one of the most important issues affecting patient safety. Therefore, practices used in the education of health professionals should be compatible with current practices in health services. For this reason, AI is a particularly critical issue for healthcare professionals and educators (13).

Technology enables individuals to receive continuous education in an intense working tempo (14). Every

new technology goes through a period of intense reputation and expectation growth, when it fails to meet expectations, it experiences a sudden decline, then a slower growth is experienced as technology develops and is integrated into our lives. The relationship of AI with learning, especially deep learning, is at the top today (15).

In this study, it is aimed to compile up-to-date information on AI practices in healthcare professional training.

Place Of AI Applications In Healthcare Professional Training

Whether students, teachers, parents and administrators accept AI in education or not, it is now part of education and training. Intelligent, adaptive or personalized learning systems are increasingly being used as a learning tool in schools and universities around the world, collecting and analyzing student data and significantly influencing the lives of students and educators.

While many people assume that AI means teaching students in education by robot teachers, the truth is simpler. However, when considered in the long term, it is an undeniable fact that a person can access all the information about his / her field of interest and profession with simple AI techniques without spending much time for education (15).

Watters says that when we remove attention, care, and human relations from education, we do not know what will happen in the future. When the whole educational process turns into machines - "smart education systems", "adaptive learning systems" or many technologies that we cannot imagine now, we must also consider the dangers we cannot foresee.

Some scientists and Stephen Hawking argues AI will also be able to destroy the world (16). Although AI does not directly produce such a result, it can only lay the groundwork for developments that may cause the potential to destroy the world, as with all scientific developments. There have also been experts who said that using wrong or insufficient data is dangerous in Machine Learning (17).

AI Application Areas

AI takes part in human life from internet search engines to home appliances, from smart phone applications to public transportation. These algorithms and software are clear examples of AI becoming a part of daily life (18,19). Siri, Tiktok, Instagram, Snapchat, Spotify, translation and voice applications we use on our phones are examples we can give to applications

that use AI. Some schools also use AI to shape students' academic careers. Higher education is also one of the areas affected by AI applications (20,21). With the digital revolution experienced today, the adoption and active use of artificial intelligence in education and training has been developing rapidly in recent years. It is seen that scientists investigate the usage areas of AI in higher education and show interest in this field (18,22,24,25,26). In the coming years, universities will need new academic departments and staff who can adapt to new jobs. For this reason, universities will have to plan their careers in order to prepare their students for the professional field and they will have to adapt to the conditions imposed by AI (27,28).

Examples Of AI Applications In Healthcare Professional Training

During the Covid-19 pandemic, serious changes were also experienced especially in the training of healthcare professionals. The disruption of face-to-face education processes, distance education in education systems have also led to an increase in AI applications. Especially, medical congresses, which have an important place in the education of health professionals, have started to be held online, and more AI application methods have started to be used in courses (42).

Practices such as first aid and resuscitation on patients in the practical training processes applied by the senior medical faculty students are now more intensely implemented with AI smart applications. In this way, it is tried to minimize the possible harm given to patients that may arise from education (29).

Nursing students now have the opportunity to practice more with AI applications in the process of learning patient follow-up and care services based on the principle of strengthening theoretical knowledge with practical application, which is one of the most important elements of nursing education. Developing practice with vital signs monitoring such as blood pressure, pulse, fever of virtual patients, virtual vascular access, and robotic procedures such as blood drawing have become more common methods in nursing education (30).

Positive Aspects Of AI Applications In Healthcare Professional Training

AI is widely used day by day in the field of health as in many other fields. AI in health; offers a wide range of use from community health promotion areas such as air pollution epidemiology, water microbe detection, and aged care and monitoring; to monitoring individuals at risk with suicidal tendencies. Early diagnosis, diagnosis, decision-making, treatment, research, ed-

ucation, and preserving and maintaining health are examples of these health areas (31). To make the correct diagnosis and early detection in most cancer screening is still in use. In addition, software (IBM Watson for Health application, Google's Deep Mind Health application) has been developed that review and collect a large number of health data and much more medical information such as all medical journal, symptom, treatment and response, case study in the world. On the other hand, AI can help clinicians adopt a more comprehensive approach to disease management and increase patient compliance by providing better coordination. It is used in laboratory procedures, physical therapy and rehabilitation, which has become widespread in recent years. It is thought that AI has started a new era in research and education in particular. Pharmaceutical development industry, which goes through many stages and long processes; follows new developments and gains great potentials at lower costs by facilitating the transaction processes with artificial intelligence (32).

It is only possible with artificial intelligence to rapidly analyze increasing data in healthcare services with analytical methods. Artificial intelligence can assist nurses in clinical decision making (33). Thanks to artificial intelligence systems, treatment and diagnostic errors in clinical applications are also minimized (33,34,35). There is a robot revolution that makes nursing practices more efficient and safer, and these robots are already helping healthcare professionals in hospitals (36).

Artificial intelligence applications created to be beneficial to people have many benefits for both patients and healthcare professionals. Besides these benefits, it also contains serious ethical concerns regarding its use in medicine. The question of who will take responsibility for the error of artificial intelligence is a matter of discussion (23).

In the report entitled "The cycle of emerging technologies" published in 2013, it was argued that human-computer teams working together are the most promising for the future (37).

There are also obstacles that make it difficult for people to work along with machines. It may be difficult to implement the developing fast technology in real life (23).

In addition, there are some concerns about the results obtained from the studies. For example, some concerns have been expressed in the detection of skin cancer. Some lesions are invisible to the eye and re-

quire more extensive examination. It has been stated that Artificial Intelligence should be used as a support tool (38). In another example, when machines know whether patients in a coma can wake up or not, it has been seen that people cannot fully trust them and wait for their patients to wake up. And the team developing the machine, considering the results that artificial intelligence also made mistakes, emphasized that the whole decision should not be left to artificial intelligence, but it should only help doctors and patient relatives to make better decisions (39).

Artificial Intelligence In The Future

Artificial Intelligence is expected to help physicians to gain insight in the future and to provide patient-specific primary care by analyzing the patient's conditions, genetic structure and social conditions. An Artificial Intelligence tool developed for diabetic retinopathy, which is one of the annual controls of Diabetes Mellitus patients, will be very useful for the patient and primary care family physician (40).

Despite the advancing technology, the time to use Artificial Intelligence instead of robotic doctors seems too far. Artificial intelligence, which is thought to be incapable of clinical reasoning and high-level decision-making, is seen as a tool to assist physicians in their technologically simple and routine tasks (40, 41).

Conclusion And Suggestions

Health professional trainers demand that training be fast, cheap and efficient. They want the system to be measurable, manageable and efficient, thus increasingly mechanized, that is to be digitalized, but they do not want AI technology to replace them. To modernize traditional health education, a new "health education reform" is needed, combining health education science and technology.

Especially in the education of health professionals, where the importance of human feelings in health care is emphasized; AI applications cannot replace the trainer. The health education reform integrating to education a technology that organizes information retaining methods by focusing on health professionals' individual differences, the learning process, and albeit being organized simply for the trainer and the student to adapt almost automatically to the features of the learning process, individual differences that are difficult to teach, will be done wonderfully. There will be many labor-saving programs and devices, and even machines, not to mechanize but ease education both for the teachers and students.

Conflicts of interest

There is no conflict of interest

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Availability of data and material (data transparency)

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