

Artificial Intelligence (AI) and Machine Learning (ML) in Clinical Practice and Physiotherapy

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Abstract

The purpose of this article is to give a non-technical introduction to Artificial Intelligence (AI) and Machine Learning (ML) in the context of health care, as well as the issues that it poses and the consequences for doctors and some of the potential effects of AI-based technology on physiotherapy practice, as well as the changes that physiotherapy education will need to make to prepare graduates for practice in a 21st century health system.

Keywords: Artificial Intelligence (AI); Machine Learning (ML); Physiotherapy

Introduction

Artificial Intelligence (AI) is a branch of mathematics that has the potential to improve healthcare by enabling innovative care delivery techniques, better decision-making, and patient participation. ^[1] Today, AI is a multidisciplinary field of study that uses computational, mathematical, logical, mechanical, and biological ideas and technologies to try to comprehend, describe, and duplicate intelligence and cognitive processes. Machine Learning (ML) is a subdomain of Artificial Intelligence (AI) that covers the use of software algorithms to find patterns in very big datasets. It lies at the heart of the most inventive development in health care AI. AI-based technologies will become more important in supplementing our cognitive skills so that humans can perform efficiently in more complicated systems. ^[2] The purpose of this study is to investigate the possible influence of AI-based technologies on clinical practice and its effects, as well as the ways in which physiotherapy education may alter to prepare professionals for practice in health system. ^[3]

The quantity of people needing physiotherapy is developing as the worldwide pace of debilitated people rises due to unhealthy lifestyle, trauma etc. ^[2] According to current research, there are a slew of possible benefits that might change clinical procedures and decision-making in the future. ^[4] Many areas of clinical practice have seen success with AI-based technology, including decision-support systems, diagnosis and prediction, image identification, and natural languageprocessing. ^[2] Because of the exponential rise of patient-related data, modern health care will be marked by a shift away from creating large volumes of patient data and toward analyzing and interpreting it to make better inferences and predictions about clinical treatment and outcomes. ^[5] However, the complexity and volume of current medical data analysis may soon push human cognition to its limitations, necessitating the usage of cognitive augmentation in the form of cooperation with Artificial Intelligence (AI) systems to improve our capacity to understand patient conditions. ^[4]

Today, AI-based research has resulted in the deployment of expert systems to support clinical decision-making, as well as computer vision algorithms that outperform humans in CT and MRI processing. ^[6]

Artificial Intelligence in Clinical Practice

Health and education systems are increasingly being perceived as complex adaptive systems with high degrees of vulnerability and continual change because of complicated, non-linear interactions that are difficult to trace and follow. AI-based technologies will play a critical role in supplementing our cognitive skills, allowing us to perform efficiently in more complex systems. ^[3] The exponential expansion of the networked medical gadgets generates a volume of data that can't possibly be processed, investigated, deciphered, or even comprehended by people alone as they surpass the limit of our psychological capacity. ^[2] The physician will need to understand how to position themselves as they operate alongside intelligent machines in this environment, not just because AI will boost our physical and cognitive capacities, but also because it will soon be impossible to function without them. ^[4] Clinicians will also need to work with software developers to guarantee that methods for recording patient-clinician interactions allow for reliable and thorough data gathering. ^[7] There is evidence that poorly constructed systems allow for the introduction of new sorts of mistakes into clinical decision-making, and this is especially true for AI-based systems. ^[6] We'll have to accept that health systems in the twenty-first century will be patient-centered, with loosely connected, cross-disciplinary care teams that incorporate smart machines with artificial intelligence. ^[4]

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Physiotherapy Education in the Intelligence Age

Human beings have always used education and schooling to adapt to social and economic disruptions, this is the way we update ourselves. In any case, as machines get more astute and the speed of progress speeds up, whereas the general worth of an expert degree is diminished with time. [2] Shrivastava et al. reported about implications of Artificial Intelligence (AI) on dynamics of medical education and care. [8] Deopujari et al. reported on algoman for gearing up artificial intelligence. [9] A number of prominent studies on learning methods and strategies were reviewed. [10-15] We should cease thinking about physiotherapy education as a time limited degree programmed that people complete once in their lives and instead conceive of it as a lifelong learning experience and reconsider it as a stage for long lasting discovering that gives students with customizable modules they can get to when they need to, instead of focusing on the straightforward transfer of information and skills that many curricula emphasize, we should try to develop students as part of a relationship centered approach to teaching and learning, physiotherapy educators must try to deliver what clever computers cannot depth of disciplinary understanding and practice wisdom, individualized learning paths and an emotional connection to students ability for creative problem solving and ideation. [16,17,3] While AI-based systems may eventually take over the tedious and tiresome tasks of managing the learning process, educators will still need to assist students in identifying meaningful goals, address the emotional aspects of learning, and build closer relationships with students to help and propel them. [2]

Conclusion

As a result, clinical and research regulation remains an important component of AI-based system design, and doctors and clinical researchers are well suited to engage in this domain. Human therapists may soon be unable to compete with clever computers and reasoning abilities, but that is beside the point. We would be better off focusing on modifying physiotherapy education and clinical practice for a fundamentally different future, one in which we learn how to excel at things that are tough for machines to imitate. In an intelligence era, human connection will be critical to success, and we must use every chance to improve our ability to care for one another, learn successfully throughout the course of our lives, and generate innovative solutions to the challenges that matter to us. Clinicians face the challenge of bringing computers and humans together in ways that improve human well-being, augment human ability, and extend human capability. Clinicians must be involved and contribute to the establishment of a new discipline of AI in health care if this revolution is to be driven by forces from

inside the health professions.

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