



The Emerging Role of Artificial Intelligence in Physiotherapy-Editorial

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Artificial intelligence (AI) is increasingly being used in the field of healthcare to improve the efficiency and accuracy of medical diagnoses, treatment plans, and decision making. It has the potential to transform the way healthcare is delivered and improve patient outcome^[1] Artificial intelligence (AI) describes a computer's ability to perform tasks normally requiring human intelligence – that is, machines that can 'think'. It is technically defined as the development of technology which is used to perform technological operations requiring involvement of human intelligence. AI is a cross-disciplinary field of research that attempts to understand, model and replicate intelligence and cognitive processes by invoking computational, mathematical, logical, mechanical and biological principles and devices^[2] Digitalization is nowadays a top topic in popular and scientific debate. In physiotherapy digitalisation has occurred on many levels, for example, applications for supporting physically active lifestyles and different systems for distance rehabilitation. Still, there is a lot of potential for development for PTs in this area^[3] The use of artificial intelligence (AI) in the field of rehabilitation is growing rapidly. Therefore, there is a need to understand how Physiotherapist (PTs) perceive AI technologies^[4]

Limitations & Challenges of Artificial Intelligence in Physiotherapy^[5]

However, it is essential to note that AI in healthcare is still in its early stages, and some challenges need to be addressed. One of the main challenges is ensuring the accuracy and reliability of AI systems, as mistakes or errors in AI-based decision-making can have severe consequences for patients^[1]

Despite the benefits that AI can bring to the Physiotherapy profession, there are limitations that need to be considered. First and foremost, AI is highly unlikely to replace the Physiotherapy profession in the future because it can't replicate certain aspects of human touch, empathy and expertise.

Lack of Personalisation: AI tools are only as good as the data they are trained on, which means that they may not account for individual differences in patients, such as unique anatomy or comorbidities.

Limited Physical Interaction: Physiotherapy requires hands-on therapy, which AI can't replace. While AI can assist with assessment and monitoring, it is unable to manipulate joints, muscles and other soft tissue.

Ethical Concerns: The use of AI in healthcare raises ethical concerns, such as issues with privacy and data security, as well as the potential for bias in the algorithms used.

Cost: Implementing AI technology in physiotherapy practice may be costly, limiting its availability to some patients or clinics.

Technical Limitations: AI is still in its infancy, and technical limitations, such as accuracy and reliability of the algorithms used, need to be considered to ensure the effectiveness of AI in physiotherapy

Training: Physiotherapy professionals may require additional and/or specialized training to properly implement AI programmes into their practice.

Accessibility: AI tools can be expensive to develop and implement, which could limit availability to smaller clinics and healthcare providers.

Inaccurate Diagnoses: AI tools are still in their early stages, and they're not always accurate. AI algorithms rely on data to learn and make predictions, so if the data used to train an AI model is biased, incomplete, or inaccurate, the results will be flawed.

Patient Privacy and Security: Patient data must be stored securely and protected against unauthorized access, theft, or misuse. Therefore, it's essential to ensure that AI tools are developed and implemented in compliance with data protection laws and regulations.

Future of Artificial Intelligence in Physiotherapy

AI has been extensively used in Physiotherapy assessment, the common example of which can be gait analysis. Recent progress in video analysis driven by machine learning has shown that computers are able to automate the diagnosis of gait abnormalities and underlying pathology, for example, in patients with Parkinson's disease and osteoarthritis^[6] AI in physiotherapy in clinical practice will improve PT performance and provide better diagnostic abilities.

Therefore, it is vital that physiotherapists actively engage in AI education and training and determine the needs for future implementations. The challenge for AI interaction in PT practice will improve the interaction between humans and machines and increase human capacity.^[7] AI tools can assist in building subjective assessments of patients, allowing physiotherapists to gather more comprehensive and detailed information about their patients' symptoms, medical history, and other relevant factors. This can help improve treatment planning and outcomes.^[5]

Conclusion

The incorporation of artificial intelligence into physiotherapy presents promising opportunities for advancing patient care. By streamlining patient assessments, offering clinical decision support, and tailoring treatment plans and rehabilitation monitoring, AI has the potential to optimize clinical practices and enhance patient outcomes. Nevertheless, it is essential to approach the integration of AI in physiotherapy with careful consideration, acknowledging the existing challenges and limitations. Balancing the utilization of machine intelligence with human expertise enables us to improve patient outcomes and revolutionize the approaches we take in providing rehabilitation to our patients.

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