Personalized Rehabilitation Programs: Tailoring Recovery Through Artificial Intelligence

Raul-Mihai RĂDULESCU

OncoGen - Genetical and Cellular Therapy for Cancer Treatments Research Center, Liviu Rebreanu Blvd, no. 156, 300723 Timişoara, Romania
E-mail: radraul22@yahoo.com

* Author to whom correspondence should be addressed; Tel.: +40 768 737 531

Abstract
In the healthcare sector, the rehabilitation landscape is undergoing a shift towards personalisation, driven by the integration of artificial intelligence (AI). Traditional rehabilitation methods often use a one-size-fits-all approach that does not best meet the individual needs and progress of each patient. This synthesis explores personalised rehabilitation programmes, in which AI plays a key role in creating personalised recovery pathways for patients. The role of AI in personalised rehabilitation revolves around analysing patient data, including medical history, physical assessments, and real-time progress monitoring. Based on this data, AI algorithms can design personalised rehabilitation plans, tailoring exercise routines and intensity levels to each patient's individual physical condition and recovery rate. The concept goes beyond simple algorithmic calculations. Using AI-based virtual rehabilitation assistants, patients receive real-time guidance and feedback during exercise sessions. The virtual assistants not only ensure the correct execution of exercises but also adapt treatments to the patient's immediate progress. The result is a dynamic and adaptive rehabilitation experience that minimises the risk of fatigue and increases engagement. The benefits of personalised rehabilitation programmes are manifold. Patients recover faster and reduce the likelihood of injury. The synthesis also illustrates real-life cases where artificial intelligence-assisted platforms have achieved remarkable success, highlighting the potential of this approach. Looking into the future, real-time wearable monitoring devices and the prospect of telerehabilitation offer exciting possibilities. However, ethical considerations of privacy and consent remain paramount and require transparency in the use of patient data. In conclusion, using artificial intelligence in personalised rehabilitation represents an innovative approach to recovery. By harnessing the analytical capabilities of AI, healthcare professionals can design rehabilitation programmes that can accelerate recovery and also prioritise patient wellbeing through personalised interventions. This synthesis invites exploration of the transformative process of personalised rehabilitation programmes and paves the way for a patient-centred approach to rehabilitation.

Keywords: Personalised rehabilitation; Artificial Intelligence; Tailored recovery; Dynamic adaptation