Title

Development of a recommendation system and data analysis in personalized medicine: an approach towards healthy vascular ageing

Abstract

Purpose: Understanding early vascular ageing has become crucial for preventing adverse cardiovascular events. To this respect, recent AI-based risk clustering models offer early detection strategies focused on healthy populations, yet their complexity limits clinical use. This work introduces a novel recommendation system embedded in a web app to assess and mitigate early vascular ageing risk, leading patients towards improved cardiovascular health. Methods: This system employs a methodology that calculates distances within multidimensional spaces and integrates cost functions to obtain personalized optimisation of recommendations. It also incorporates a classification system for determining the intensity levels of the clinical interventions. Results: The recommendation system showed high efficiency in identifying and visualizing individuals at high risk of early vascular ageing among healthy patients. Additionally, the system corroborated its consistency and reliability in generating personalized recommendations among different levels of granularity, emphasizing its focus on moderate or low-intensity recommendations, which could improve patient adherence to the intervention. Conclusion: This tool might significantly aid healthcare professionals in their daily analysis, improving the prevention and management of cardiovascular diseases. © The Author(s), under exclusive licence to Springer Nature Switzerland AG 2024.

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