Opinion
Volume 08:06, 2024

Clinical and Medical Case Reports

ISSN: 2684-4915 Open Access

An Evidence and Gap Map for a Protocol for AI-Powered Tools to Improve Mobility and Function in Elderly People

Alsobhi Zhang*

Department of Molecular Medicine, Sapienza University of Rome, Rome, Italy

Introduction

The rapid advancement of Artificial Intelligence (AI) technologies presents significant opportunities for improving the mobility and functional independence of elderly populations. As the global population ages, addressing mobility challenges and maintaining functional capabilities are critical to enhancing quality of life and reducing the burden on healthcare systems. This essay outlines the development of an evidence and gap map for creating a protocol to evaluate AI-powered tools aimed at improving mobility and function in elderly people. Functional limitations often exacerbate these issues, as they hinder the ability to perform Activities of Daily Living (ADLs) such as dressing, cooking, and personal hygiene.

The integration of AI-powered tools into mobility and functional support offers a transformative solution. These tools include assistive devices, rehabilitation technologies, and wearable systems that leverage machine learning, computer vision, and robotics to address the unique needs of elderly users. By providing personalized, adaptive, and real-time support, AI technologies have the potential to mitigate the effects of aging-related mobility impairments and enhance overall well-being.

Description

Existing research highlights the promise of AI-powered tools in improving mobility and function among elderly populations. For example, robotic exoskeletons and powered orthoses have demonstrated efficacy in supporting walking and reducing fall risk. Machine learning algorithms integrated into wearable sensors can monitor gait patterns, detect anomalies, and provide feedback to both users and healthcare providers. Virtual reality (VR) and augmented reality (AR) systems are also gaining traction in rehabilitation settings, where they facilitate engaging and immersive therapeutic exercises. Despite these advances, the evidence base is fragmented and lacks standardization. Research on the usability, acceptability, and accessibility of AI-powered tools in diverse real-world contexts is therefore essential. This underscores the need for a comprehensive evidence and gap map to guide the development of robust evaluation protocols [1].

Finally, ethical and equity considerations are frequently overlooked in the design and deployment of AI-powered tools. Issues such as data privacy, algorithmic bias, and disparities in access to technology must be addressed to ensure that these innovations benefit all elderly individuals, regardless of socioeconomic status or geographical location.To address these gaps and enhance the evidence base, a standardized protocol for evaluating AI-powered tools is needed. This protocol should incorporate the following elements, Stakeholder Engagement: Involving elderly users, caregivers, healthcare providers, and technology developers in the design and evaluation process to ensure that interventions are user-centered and contextually relevant. Establishing standardized and validated outcome measures that capture the multidimensional impacts of AI-powered tools on mobility, function, and overall well-being. Raising awareness about the benefits and limitations of AI-powered tools among elderly populations and their families to promote informed decision-making.Leveraging international collaborations to share knowledge, resources, and best practices for the development and dissemination of AI technologies [2].

Conclusion

As AI technologies continue to evolve, their potential to transform the lives of elderly individuals hinges on our ability to address the multifaceted challenges of design, evaluation, and implementation. Through interdisciplinary collaboration, stakeholder engagement, and a commitment to equity, we can harness the power of AI to enhance mobility, independence, and quality of life for aging populations worldwide.

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***Address for Correspondence:** Alsobhi Zhang, Department of Molecular Medicine, Sapienza University of Rome, Rome, Italy, E-mail: alsobhizhang@edu.it*

Received: 26 November, 2024, Manuscript No. cmcr-25-159071; **Editor assigned:** 28 November, 2024, Pre QC No. P-159071; **Reviewed:** 12 December, 2024, QC No. Q-159071; **Revised:** 17 December, 2024, Manuscript No. R-159071; **Published:** 24 December, 2024, DOI: 10.37421/2684-4915.2024.8.343

How to cite this article: Zhang, Alsobhi. "An Evidence and Gap Map for a Protocol for AI-Powered Tools to Improve Mobility and Function in Elderly People." *Clin Med Case Rep* 8 (2024): 343.