Feasibility of Personalized Online Upper-limb Physiotherapy for Inpatient Stroke Survivors

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Abstract

Stroke survivors often encounter challenges in accessing personalized upper-limb physiotherapy during their inpatient rehabilitation. This study explores the feasibility of implementing personalized online upper-limb physiotherapy interventions for inpatient stroke survivors. Through a comprehensive literature review, we examine technological modalities such as virtual reality, augmented reality and tele-rehabilitation. These technologies offer innovative solutions to accessibility issues, providing tailored interventions that enhance rehabilitation outcomes. The feasibility of personalized online physiotherapy is underscored by positive outcomes in patient engagement, adherence and rehabilitation progress. Despite challenges, such as ensuring technological accessibility and addressing barriers, the integration of personalized online upper-limb physiotherapy holds promise in transforming stroke rehabilitation, fostering inclusivity and improving overall patient outcomes.

Keywords: Stroke rehabilitation • Upper-limb physiotherapy • Personalized interventions • Online rehabilitation

Introduction

Stroke survivors often face substantial challenges in regaining upper limb functionality during the early stages of recovery. The feasibility of innovative and personalized rehabilitation approaches, particularly those delivered online represents a pivotal area of exploration in contemporary stroke rehabilitation. This study aims to investigate the feasibility of implementing personalized online upper-limb physiotherapy interventions for inpatient stroke survivors. The integration of technology into rehabilitation strategies has the potential to address accessibility issues, provide tailored interventions and enhance overall rehabilitation outcomes. By examining the existing literature on personalized online physiotherapy for upper-limb recovery in inpatient stroke settings, this review seeks to delineate the current state of knowledge, identify technological modalities employed and assess the reported feasibility and efficacy of such interventions [1].

Literature Review

The burgeoning field of personalized online physiotherapy for upper-limb rehabilitation after stroke is characterized by a diverse array of technological interventions. Virtual Reality (VR), Augmented Reality (AR) and tele-rehabilitation platforms have emerged as prominent modalities facilitating personalized and accessible interventions for inpatient stroke survivors. Studies exploring the feasibility of these technologies consistently report positive outcomes in terms of patient engagement, adherence and rehabilitation progress. Virtual reality applications, often immersive and interactive, offer a simulated environment for stroke survivors to engage in targeted upper-limb exercises. These applications, when personalized to individual abilities and needs, have shown promise in enhancing motor recovery, increasing motivation and providing real-time performance feedback. Augmented reality,

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which overlays digital information onto the real-world environment, has been employed to create interactive rehabilitation scenarios that bridge the gap between the virtual and physical domains. These technologies allow for personalized adjustments based on the patient's functional status and response to interventions. Tele-rehabilitation, encompassing online physiotherapy sessions and remote monitoring, addresses accessibility challenges by bringing rehabilitation directly to the inpatient setting. Personalized exercise programs, delivered through secure online platforms, enable stroke survivors to engage in rehabilitation exercises under the guidance of physiotherapists without the constraints of traditional in-person sessions [2,3].

The feasibility of tele-rehabilitation is underscored by its potential to reach a broader patient population, reduce healthcare costs and enhance patient-centered care. While the literature consistently suggests the feasibility and efficacy of personalized online upper-limb physiotherapy for inpatient stroke survivors, certain challenges and considerations must be acknowledged. These include the need for tailored technological interventions, ensuring accessibility for diverse patient demographics, addressing potential technological barriers and establishing a supportive framework for both patients and healthcare providers. The literature review highlights the promising landscape of personalized online upper-limb physiotherapy for inpatient stroke survivors. Virtual reality, augmented reality and tele-rehabilitation technologies offer innovative solutions to the challenges faced in traditional rehabilitation settings. As technology continues to advance, the feasibility and efficacy of these interventions are expected to further improve, potentially reshaping the landscape of stroke rehabilitation and fostering greater accessibility to personalized care for inpatient stroke survivors [4].

Discussion

The exploration of personalized online upper-limb physiotherapy for inpatient stroke survivors reveals a promising landscape marked by technological innovation and potential for transformative rehabilitation. Virtual reality, augmented reality and tele-rehabilitation technologies have emerged as feasible modalities, demonstrating positive outcomes in terms of patient engagement and rehabilitation progress. The discussion underscores the significance of these technologies in addressing accessibility issues, providing tailored interventions and offering real-time feedback to inpatient stroke survivors. Virtual reality applications, when personalized to individual needs, have shown potential in creating immersive and interactive rehabilitation environments. Augmented reality, by overlaying digital information onto the real world, bridges the gap between the virtual and physical domains,

offering innovative interactive scenarios for upper-limb rehabilitation. Tele-rehabilitation, with its capacity for remote monitoring and personalized exercise programs, addresses the need for accessible and patient-centered care during inpatient stroke rehabilitation. However, challenges remain, such as ensuring technological accessibility for diverse patient populations, addressing potential technological barriers and establishing a supportive framework for both patients and healthcare providers. The discussion emphasizes the need for on-going research to refine these technologies, tailor interventions to diverse patient needs and establish robust frameworks for implementation in diverse healthcare settings [5,6].

Conclusion

In conclusion, the feasibility of personalized online upper-limb physiotherapy for inpatient stroke survivors holds great promise in reshaping the landscape of stroke rehabilitation. Technological innovations such as virtual reality, augmented reality and tele-rehabilitation provide accessible and tailored interventions, fostering patient engagement and rehabilitation progress. Despite challenges, the potential transformative impact of these technologies on stroke rehabilitation calls for continued research, development and integration into clinical practice. The implementation of personalized online physiotherapy stands as a beacon of hope in improving accessibility, inclusivity and overall outcomes for inpatient stroke survivors undergoing upper-limb rehabilitation.

Acknowledgement

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Conflict of Interest

There are no conflicts of interest by author.

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