

Cognitive Rehabilitation: Diverse Needs, Innovative Solutions

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Introduction

Systematic reviews and meta-analyses highlight the impact of cognitive rehabilitation in addressing post-stroke cognitive impairment. Findings clearly indicate various cognitive rehabilitation strategies are effective in improving cognitive functions after a stroke, underscoring their crucial role in neurorehabilitation[1].

Cognitive rehabilitation for mild traumatic brain injury is effective. Comprehensive reviews of randomized controlled trials show it addresses cognitive challenges, often focusing on memory, attention, and executive functions, providing practical benefits for individuals[2].

Digital cognitive rehabilitation is emerging as a promising tool for older adults. This systematic review underscores the potential of technology-driven interventions to improve cognitive functions, making therapy more accessible and engaging. What this really means is innovation could transform how we deliver care[3].

When it comes to mild to moderate dementia, cognitive rehabilitation shows clear effectiveness. This meta-analysis confirms tailored interventions can meaningfully improve cognitive outcomes, suggesting its valuable role in managing symptoms and supporting individuals living with dementia[4].

Let's break down cognitive rehabilitation for multiple sclerosis. This systematic review and meta-analysis of randomized controlled trials indicates that these interventions are effective in addressing cognitive challenges commonly faced by individuals with MS, offering a therapeutic path for improvement[5].

Goal-oriented cognitive rehabilitation shows promise for older individu-

als with mild cognitive impairment. A pilot randomized controlled trial demonstrated its feasibility and potential benefits, suggesting that personalized, goal-driven approaches can support cognitive function in this population[6].

Virtual reality-based cognitive rehabilitation offers a compelling avenue for individuals with acquired brain injury. This systematic review and meta-analysis found that VR interventions are indeed effective, providing an immersive and engaging way to deliver therapy and enhance cognitive recovery[7].

Cognitive rehabilitation is also relevant for younger populations. This systematic review on children with cancer highlights that these interventions can help mitigate cognitive deficits often associated with cancer treatments, offering hope for improved long-term outcomes[8].

Focusing on executive functions after stroke, this systematic review and meta-analysis indicates that specific cognitive rehabilitation interventions are effective. This is important because executive functions are crucial for daily living, and targeted therapy can make a real difference[9].

Telerehabilitation, delivering cognitive therapy remotely, holds significant promise for adults with acquired brain injury. This systematic review demonstrates its effectiveness, offering a flexible and accessible way to provide much-needed support, especially where remote care is increasingly important[10].

Description

Cognitive rehabilitation holds significant promise and has demonstrated clear effectiveness across a broad spectrum of neurological conditions and acquired brain injuries. For individuals who have experienced a stroke, comprehensive systematic reviews and meta-analyses consistently show that various cognitive rehabilitation strategies are highly effective in improving post-stroke cognitive impairment. These findings solidify their crucial role in contemporary neurorehabilitation paradigms, significantly enhancing patient recovery and quality of life [1]. In a similar vein, research indicates that cognitive rehabilitation can effectively address the complex cognitive challenges frequently faced by individuals with mild traumatic brain injury. These specialized interventions often focus on fundamental areas such as memory, attention, and executive functions, thereby offering tangible and practical benefits that translate into improved daily functioning and independence [2]. Furthermore, for those living with multiple sclerosis, systematic reviews and meta-analyses of randomized controlled trials confirm that these carefully designed interventions are effective in managing the often-debilitating cognitive difficulties common to the condition, providing a viable therapeutic path for sustained improvement [5]. This broad applicability across diverse neurological etiologies underscores the

foundational importance of tailored cognitive support in promoting comprehensive neurological recovery and adaptation.

The proven benefits of cognitive rehabilitation extensively extend to conditions associated with aging and neurodegeneration, offering critical support to vulnerable populations. When it comes to mild to moderate dementia, a robust meta-analysis unequivocally confirms its clear effectiveness, demonstrating that carefully tailored interventions can meaningfully improve cognitive outcomes. This strongly suggests a valuable and integral role for cognitive rehabilitation in managing the progressive symptoms of dementia and providing essential support to individuals navigating the complexities of this challenging condition [4]. Similarly, for older individuals diagnosed with mild cognitive impairment, a precursor to dementia, goal-oriented cognitive rehabilitation has shown considerable promise. A pilot randomized controlled trial meticulously demonstrated both its feasibility and its potential for substantial cognitive benefits, indicating that personalized, goal-driven approaches can effectively support and even enhance cognitive function in this particular demographic [6]. These collective findings powerfully reinforce the potential for targeted rehabilitation efforts to mitigate cognitive decline and significantly enhance functionality and independence in older adults.

The field of cognitive rehabilitation is rapidly evolving, with technological advancements significantly enhancing both accessibility and engagement in therapeutic interventions. Digital cognitive rehabilitation, for instance, is emerging as an exceptionally promising tool, particularly for the expanding population of older adults. This systematic review powerfully underscores the inherent potential of technology-driven interventions not only to improve various cognitive functions but also to fundamentally transform how care can be delivered, making therapy more accessible and inherently more engaging [3]. Beyond traditional digital platforms, virtual reality-based cognitive rehabilitation offers a compelling and immersive avenue for individuals recovering from acquired brain injury. Systematic reviews and meta-analyses have found that VR interventions are indeed effective, providing an innovative and engaging way to deliver therapeutic exercises and significantly enhance cognitive recovery [7]. Complementing these innovations, telerehabilitation, which involves delivering cognitive therapy remotely, also holds substantial and growing promise for adults who have sustained an acquired brain injury. A comprehensive systematic review convincingly demonstrates its effectiveness, offering a highly flexible and accessible way to provide much-needed support, especially in a contemporary world where remote care models are increasingly vital [10]. These technological advancements are pivotal in expanding the reach and personalizing the experience of cognitive rehabilitation for a diverse patient base.

Cognitive rehabilitation's scope encompasses highly specific cognitive domains and extends to support diverse patient demographics, including critical younger populations. For example, specific cognitive rehabilitation interventions are notably effective in improving executive functions after a stroke. This is a critical area, as executive functions are absolutely crucial for successful daily living and independence, and targeted therapy in this domain can make a profound difference [9]. Moreover, cognitive rehabilitation is highly relevant and beneficial for younger populations, beyond adult cohorts. A systematic review specifically focusing on children with cancer powerfully highlights that these carefully designed interventions can actively help mitigate cognitive deficits often associated with demanding cancer treatments, offering substantial hope for improved long-term cognitive and academic outcomes [8]. This demonstrates the comprehensive and adaptable nature of cognitive rehabilitation, tailoring interventions to

address a wide array of cognitive challenges across the entire lifespan.

Overall, the consistent evidence from systematic reviews, meta-analyses, and randomized controlled trials emphasizes the robust and evolving efficacy of cognitive rehabilitation. Its multifaceted application, from addressing general cognitive impairment to targeting specific executive functions, and its adaptability through both conventional and technological delivery methods, firmly establish its indispensable role in modern healthcare. This growing body of literature ensures a more comprehensive and personalized approach to cognitive recovery and well-being for individuals across all ages and diverse neurological conditions.

Conclusion

Cognitive rehabilitation consistently demonstrates significant effectiveness across a wide range of neurological conditions and age groups. For individuals recovering from stroke, various strategies have proven crucial in improving cognitive functions, including specific executive functions [1, 9]. The approach is also highly effective for those with mild traumatic brain injury, addressing memory, attention, and executive challenges [2]. Furthermore, it offers valuable support for patients with mild to moderate dementia and older adults with mild cognitive impairment, enhancing cognitive outcomes and supporting functionality [4, 6].

Beyond traditional methods, modern technological advancements are transforming rehabilitation delivery. Digital cognitive rehabilitation [3], virtual reality-based interventions [7], and telerehabilitation [10] are all emerging as effective and accessible tools, particularly beneficial for older adults and individuals with acquired brain injury. Critically, these innovations make therapy more engaging and broadly available. Notably, cognitive rehabilitation is not solely for adults; it also extends to younger populations, helping children with cancer mitigate cognitive deficits associated with their treatments [8]. Overall, the evidence highlights cognitive rehabilitation as an indispensable component of neurorehabilitation, continuously evolving to meet diverse patient needs and improve long-term outcomes.

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