


## Neurorehabilitation Success: How Personality Influences Recovery

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### ABSTRACT

Neurorehabilitation is a critical aspect of recovery for individuals who have suffered neurological injuries or conditions, such as stroke, brain tumors, and acquired brain injuries. While the effectiveness of various neurorehabilitation techniques has been extensively studied, the role of personality in influencing recovery outcomes remains an intriguing and underexplored area. This letter aims to highlight the significance of personality traits in neurorehabilitation success and to suggest how incorporating personality assessments into rehabilitation programs can enhance recovery outcomes. Personality traits play a crucial role in influencing neurorehabilitation outcomes. By incorporating personality assessments into rehabilitation programs, clinicians can develop personalized interventions that cater to the unique needs of each patient. This approach can enhance engagement, adherence, and ultimately, recovery outcomes. Future research should continue to explore the interplay between personality and neurorehabilitation, with a focus on developing tailored therapeutic strategies that maximize the potential for recovery.

**Keywords:** Neurorehabilitation, Personality, Recovery.

To the Editorial Board,

Neurorehabilitation is a critical aspect of recovery for individuals who have suffered neurological injuries or conditions, such as stroke, brain tumors, and acquired brain injuries. While the effectiveness of various neurorehabilitation techniques has been extensively studied (Albert & Kesselring, 2011; Bartolo, 2023; Boccuni et al., 2022; Huang & Krakauer, 2009; Knecht et al., 2015; Mann et al., 2023; Micera et al., 2020; Pasquini et al., 2022; Sartori et al., 2016; Signal et al., 2023; Viruega & Gaviria, 2022; Young et al., 2021), the role of personality in influencing recovery outcomes remains an intriguing and underexplored area. This letter aims to highlight the significance of personality traits in neurorehabilitation success and to suggest how incorporating personality assessments into rehabilitation programs can enhance recovery outcomes.

Neurorehabilitation encompasses a range of therapeutic approaches designed to improve the functional recovery of individuals with neurological impairments. These interventions aim to restore motor, cognitive, and psychosocial functions. Albert and Kesselring (2011) provide a comprehensive overview of stroke neurorehabilitation, emphasizing the importance of early and intensive therapy in maximizing recovery (Albert & Kesselring, 2011). Similarly, Bartolo (2023) discusses the need for spreading knowledge and implementing research in neurorehabilitation for brain tumor patients, highlighting the benefits of tailored therapeutic approaches (Bartolo, 2023).

Personality traits, such as conscientiousness, extraversion, and neuroticism, significantly influence how individuals engage with and respond to neurorehabilitation. Conscientious individuals, for example, are more likely to adhere to rehabilitation protocols and engage actively in their recovery process, which can lead to better outcomes. In contrast, individuals with high levels of neuroticism may experience heightened anxiety and stress, which can impede their progress in rehabilitation (Abraham et al., 2022; Ansari et al., 2021; Mosadegh et al., 2023).

Mann et al. (2023) explored the psychosocial functioning and its mediation of motor and cognitive function changes in neurorehabilitation. Their findings suggest that personality traits significantly impact how patients cope with the rehabilitation process and their overall recovery trajectory. This underscores the need for personalized rehabilitation programs that consider individual personality profiles (Mann et al., 2023).

Different neurorehabilitation techniques may interact with personality traits in varying ways. For instance, robotic neurorehabilitation, as discussed by Huang and Krakauer (2009), involves the use of computational motor learning perspectives to enhance recovery. This approach may be particularly effective for individuals who are open to new experiences and technological interventions (Huang & Krakauer, 2009). Conversely, traditional high-intensity neurorehabilitation, which Knecht et al. (2015) found to be beneficial for both young and old stroke patients, may require a different set of personality traits, such as persistence and resilience (Knecht et al., 2015).

Boccuni et al. (2022) emphasized the need to reconcile research findings and clinical practice in upper limb neurorehabilitation, suggesting that personalized approaches that account for individual differences, including personality traits, can improve clinical outcomes (Boccuni et al., 2022). This aligns with the findings of Micera et al. (2020), who advocate for advanced neurotechnologies tailored to individual needs (Micera et al., 2020).

Personality traits can influence various aspects of the neurorehabilitation process, from initial engagement to long-term adherence and recovery outcomes. For example, Kwakkel et al. (2004) demonstrated that augmented exercise therapy time after stroke significantly improves recovery. Patients with high levels of conscientiousness may be more likely to benefit from extended therapy sessions due to their diligent nature (Kwakkel et al., 2004).

Moreover, the role of social and emotional support, which is often mediated by personality traits, is crucial in neurorehabilitation. Individuals who are extraverted and possess strong social networks may experience better support systems, which can enhance their recovery. This is supported by the findings of Signal et al. (2023), who highlighted the importance of telerehabilitation and its implementation during the COVID-19 pandemic, noting that social support plays a critical role in successful rehabilitation (Signal et al., 2023).

Given the significant influence of personality on neurorehabilitation outcomes, it is essential to incorporate personality assessments into rehabilitation programs. These assessments can help clinicians tailor interventions to individual needs, thereby enhancing the effectiveness of rehabilitation. For instance, Sartori et al. (2016) suggest using neural data-driven musculoskeletal modeling for personalized neurorehabilitation technologies, which can be adapted based on personality traits (Sartori et al., 2016).

Additionally, the integration of brain-computer interfaces (BCIs) in neurorehabilitation, as discussed by Young et al. (2021), can benefit from considering personality traits. BCIs require a high level of patient engagement and motivation, which may be influenced by personality characteristics (Young et al., 2021). Understanding these traits can help in designing more effective BCI-based rehabilitation programs.

In sum, personality traits play a crucial role in influencing neurorehabilitation outcomes. By incorporating personality assessments into rehabilitation programs, clinicians can develop personalized interventions that cater to the unique needs of each patient. This approach can enhance engagement, adherence, and ultimately, recovery outcomes. Future research should continue to explore the interplay between personality and neurorehabilitation, with a focus on developing tailored therapeutic strategies that maximize the potential for recovery.

Sincerely,

#### Authors' Contributions

Authors contributed equally to this article.

#### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

#### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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#### Declaration of Interest

The authors report no conflict of interest.

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