The effect of pulmonary rehabilitation on personality change: findings and correlated change with quality of life

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Résumé

Introduction: A growing body of research indicates that personality traits can be changed through therapeutic interventions (for review, see Roberts et al., 2017), and these changes can be correlated with changes in other psychological factors (e.g., self-esteem; Allemand et al., 2024). However, most of the existing evidence has focused on psychological interventions. It is unclear whether therapeutic interventions primarily based on physical activity, such as pulmonary rehabilitation, can also influence personality trajectories, and whether such changes are correlated with health outcomes. Based on the Five-Factor Model (McCrae & John, 1992), the objective of this study was to investigate the effect of pulmonary rehabilitation on personality change and the correlated changes with quality of life in patients with respiratory chronic diseases (CRD).

Method: 719 patients with CRD were included at the beginning of a four-week inpatient pulmonary rehabilitation. Personality traits were assessed using the Big Five Inventory-2, and quality of life was measured with the VQ11. Assessments were conducted at the beginning of pulmonary rehabilitation (T1), at the end of the intervention (T2), and six months post-intervention (T3). Latent change score models were used to investigate mean-level changes in personality traits and quality of life, as well as correlated change between the two constructs.

Results: We first examined mean-level changes. Between T1 and T2, significant changes were observed, including a decrease in neuroticism (d = -.29, $p <$ .001) and increases in extraversion (d = .23, $p <$ .001), conscientiousness (d = .08, $p <$ .01), and quality of life (d = .57, $p <$ .001). From T2 to T3, these trends reversed: neuroticism increased (d = .25, $p <$ .001), while extraversion (d = -.26, $p <$ .001), conscientiousness (d = -.17, $p <$ .001), and quality of life declined (d = -.75, $p <$ .001). During pulmonary rehabilitation (T1 to T2), a decrease in neuroticism and increases in extraversion and conscientiousness were correlated with improvements in quality of life (r = -.24, .33, and .33, respectively; all

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$p < .001$). During the follow-up (T2 to T3), an increase in neuroticism and a decrease in extraversion were correlated with a decline in quality of life (r = -.24, .27, respectively; all $p < .01$), whereas change in conscientiousness was not significantly correlated (r = .19, $p = .05$).

Discussion: This study is the first to provide evidence that an intervention mostly based on physical activity can lead to short-term adaptive personality changes. Pulmonary rehabilitation may temporarily mitigate maladaptive personality changes observed after the diagnosis of chronic respiratory diseases (Jokela et al., 2014). However, personality changes were not sustained over time, which is consistent with the well-documented decline in health outcomes observed after pulmonary rehabilitation. This decline is commonly attributed to the failure to maintain increased levels of physical activity after the intervention. While the cross-sectional association between personality and health is well-established, our findings extend this relationship to dynamic processes in a clinical population, showing that changes in some personality traits are significantly correlated with changes in quality of life.

Conclusions / Perspectives: Personality change may represent a novel indicator of the efficacy of pulmonary rehabilitation. These findings underscore the importance of developing interventions to support long-term personality change, which may help to maintain the benefits of rehabilitation in patients with chronic respiratory diseases.

References

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