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Virtual reality in affective disorders: a pilot study on cognitive performance and electroencephalographic correlates of depression

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Depression, one of the most frequently diagnosed conditions, leads to significant cognitive deficits and co-morbidity. In recent decades, scientific research has focused on biomarker identification and technological advancements like virtual reality (VR) for diagnosis support. This study evaluates the role of theta band power recorded through a Geodesic cup during 5 minutes of resting state, linked to cognitive performance obtained in the Trail Making Test (TMT) A and B and the N-Back, performed by participants in a VR environment. The sample consists of 15 university students with depressive symptoms (PHQ - 9 ≥ 9) and 15 healthy controls (PHQ - 9 ≤ 5). The results show a statistically significant difference in the number of errors made in the TMT-A (p = .034), while no differences were recorded in theta band power. Subsequently, a hierarchical linear regression analysis was conducted through two models, to evaluate the role of depressive symptoms and of theta band power in the prediction of the errors made in the TMT-A. The Model 1 analyzed the role of Relative Theta Power, while the Model 2 considered the Absolute Theta Power. Both models showed that only the depressive symptoms can predict errors made in the TMT-A (Model 1: p = .030, Model 2: p = .020), contrary to theta band power. Moreover, the Akaike Information Criterion shows that Model 2 is preferable to Model 1. Overall, findings partly align with existing literature, highlighting the need for further studies.

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