

Impact of sleep deprivation on EEG markers of emotion regulation in young adults

Cheng Li

The Education University of Hong Kong, Hong Kong, Hong Kong, Hong Kong

Esther Yuet Ying Lau

The Education University of Hong Kong, Hong Kong, Hong Kong, Hong Kong

Janet Hsiao

University of Hong Kong, Hong Kong, Hong Kong

Jinxiao Zhang

Stanford University, stanford, California, United States

Yeuk Ching Lam

the Education University of Hong Kong, Hong Kong, Hong Kong

Jihui Zhang

The Chinese University of Hong Kong, Hong Kong, Hong Kong, Hong Kong

Lydia Ting Sum Yee

Education University of Hong Kong, Hong Kong, Hong Kong

Benjamin Rusak

Dalhousie University, Halifax, Nova Scotia, Canada

Abstract

Sleep deprivation (SD) has negative effects on emotional regulation, but few studies have evaluated electroencephalographic (EEG) indices and none of these have used a within-subject design. Twenty-nine participants (17 female) completed a repeated-measures study protocol involving a night of normal sleep (NS) and a night of SD, followed by resting-state EEG during the following morning. Established EEG indices of emotion regulation, frontal alpha asymmetry (FAS) and slow wave/fast wave (SW/FW) ratio in frontal sites (F3, F4, Fz), were investigated. Our results did not reveal SD effects in FAS ($t_{28} = -.960$, $p = .345$) or in SW/FW ratio ($t_{28} = 0.737$, $p = 0.467$). Although other studies have demonstrated emotional dysregulation after SD, two well-studied EEG markers of emotional dysregulation did not reflect altered emotional states after SD in the current within-subject study. Future studies combining EEG and other indices of emotional regulation may help elucidate these results.