Effect of biofeedback training on operator’s cognitive performance

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Abstract

BACKGROUND: Predominantly cognitive tasks assigned to the shop floor can lead to decreased cognitive functions, thereby increasing occupational accident risks. A potential approach to prevent such circumstances is by improving operator’s cognitive performance. OBJECTIVE: This study aimed to examine whether heart rate variability (HRV) biofeedback training could improve cognitive performance among electronic manufacturing’s operators. PARTICIPANTS: Subjects consisted of 36 female operators who were randomly assigned as the experimental (n=19), and control group (n=17). METHOD: The experimental participants received five session of weekly HRV biofeedback training of 30-50 minutes each. Physiological stress profiles and cognitive performance were assessed at pre and post-intervention. RESULTS: Significant group x time effects were observed for attention and memory (p< 0.01) but not present for cognitive flexibility. Significant higher total spectrum HRV and low frequency (LF) power also occurred during biofeedback sessions, in addition to slower respiration rate. Physiological stress profile showed that the biofeedback participants were able to increase their LF activity at baseline, stressor, and recovery periods from pre to post. CONCLUSION: This study demonstrates potential application of HRV biofeedback for operator’s performance enhancement, associated with increases in HRV. © 2013-IOS Press and the authors. All rights reserved.

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attention, cognitive flexibility, heart rate variability, memory, Psychophysiology

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