

Effects of peppermint odor on performance and fatigue in a simulated air traffic control task

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Abstrak

Air Traffic Control (ATC) tasks require a high mental workload with complex cognitive activities. Since the tasks are likely to be fatigue-inducing and may cause aircraft accidents, ergonomics interventions are needed. This study investigated the effectiveness of peppermint odor on improved performance and fatigue while conducting simulated ATC tasks. A total of 16 participants performed ATC tasks using SkyHigh simulation software for two hours in two conditions (with and without peppermint odor). While the simulator was able to record participants' performance during ATC tasks, participants' fatigue development was monitored using an electroencephalograph (EEG), a heart rate monitor (HRM), and psychomotor vigilance task (PVT) apparatus. The results of this study show that the use of peppermint odor significantly ($p < 0.05$) improved simulation performance, based on all simulation indicators. The peppermint odor also significantly ($p < 0.05$) inhibited fatigue development, based on an EEG measure (decline in parietal α), two HRM measures (decline in low frequency power (LF) and increase in high frequency power (HF)), and a PVT measure (10% of the longest time reaction).