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CONSEQUENCES OF SLEEP DEPRIVATION ON PERFORMANCE & MOOD STATES

Abstract

Introduction: A significant level of vigilance is demanded of an astronaut during space travel. This study's purpose is to determine how group performance and team dynamics adapt to continuous sleep deprivation. A specific aim is to identify which measures may best predict fatigue induced performance and/or mood changes as induced by fatigue. **Hypothesis:** Individuals subjected to acute sleep deprivation (36 hours) will show fatigue-induced performance impairments, and deterioration in mood states, relative to their resting baseline levels. **Methods:** Measurements of cognitive performance/mood states were administered pre/during and post sleep deprivation. Performance assessment batteries include DELTA, WinSCAT and PVT. Mood state composite calculations were measured in two dimensions: activation and affective. **Results:** All mean performance levels, and mean mood states declined during normal sleep times (02:02-20:05 [18hrs] sleep deprivation 6/29) and then rose slightly during normal wake times (08:12-20:05 hrs 6/29). Effects of accumulated sleep loss of >24 hrs are evident from 08:12-20:05 on 6/29 and performance levels are lower than corresponding times from the previous days, 6/27 & 6/28. Individual performance composite score percentage change was compared between baseline; Day 1 and sleep deprivation, Days 2 & 3. Then Days 2 & 3 was compared with Day 4, post sleep deprivation. At least five of the seven DELTA sub-tests showed at least a 5% performance decrement relative to baseline which was statistically significant ($p < 0.02$) in two of the five subjects. Self-reported mood states recorded a greater decline in the activation mood dimension. **Conclusions:** Evidence supports that sleep deprivation results in adverse changes in cognitive task performance and deterioration in mood states.