



# Subjective Symptoms During Acute Total Sleep Deprivation

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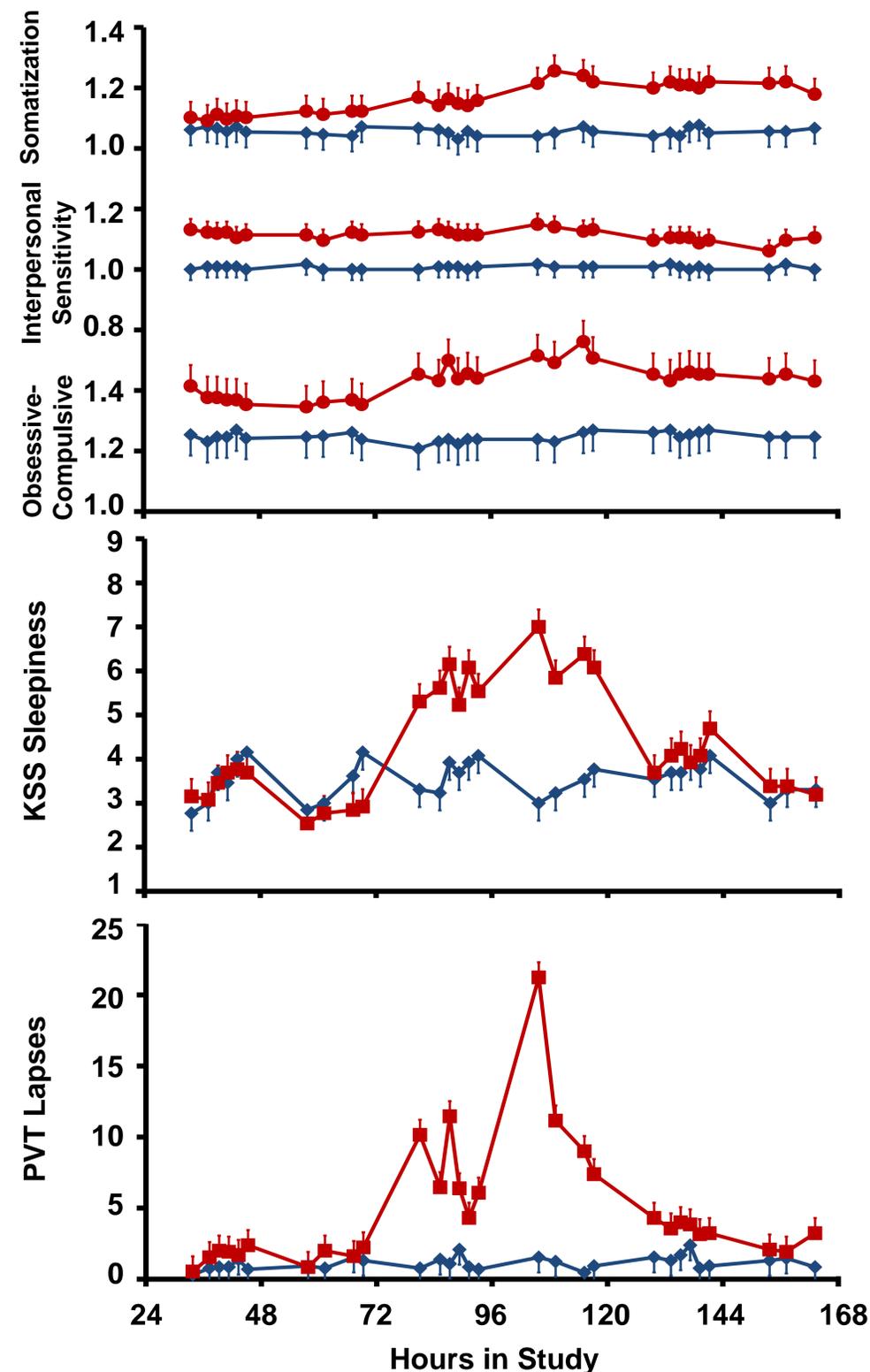
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## Introduction

- The effects of acute total sleep deprivation on general well-being have not been systematically investigated.
- We compared self-reported symptoms in subjects undergoing 62h of total sleep deprivation versus controls to examine whether symptomology is influenced by sleep loss.

## Methods

- N=26 healthy, non-smoking adults (ages 22-37; 10 females) with regular sleep schedules spent 6 consecutive days and nights in a sleep laboratory.
- Following two baseline days (10h TIB/day), subjects were randomized to either 62h of total sleep deprivation (n=13) or matching control (10h TIB/day; n=13), which was followed by two recovery days (10h TIB/day) for both groups.
- Assignment to condition was announced just before bedtime at the end of the second baseline day.
- At 2h intervals throughout most of scheduled wakefulness, subjects completed the 58-item, 5-subscale Hopkins Symptoms Checklist (HSCL), the Karolinska Sleepiness Scale (KSS), and a 10min Psychomotor Vigilance Test (PVT).
- Mixed-effects ANOVA and principal component analysis (PCA) were performed on the data from the second baseline day through to the second recovery day, to examine the effects of condition and time-in-study on HSCL subjective symptoms, KSS subjective sleepiness, and PVT lapses (RT>500ms).



**Figure:** Group average data from the second baseline day to the second recovery day. Top: HSCL subscales. Middle: KSS. Bottom: PVT. Control group in **blue**, Sleep Deprivation group in **red**.

## Results

- Significant effects of condition were found for HSCL Obsessive-Compulsive ( $F=4.5, P=0.034$ ), HSCL Interpersonal Sensitivity ( $F=5.4, P=0.020$ ), KSS sleepiness ( $F=5.5, P=0.012$ ) and PVT lapses ( $F=23.8, P<0.001$ ). See Figure.
- Significant condition by time interactions were found for HSCL Somatization ( $F=3.6, P<0.001$ ), HSCL Obsessive-Compulsive ( $F=1.6, P=0.024$ ), KSS sleepiness ( $F=8.1, P<0.001$ ) and PVT lapses ( $F=10.7, P<0.001$ ).
- For the second baseline day (i.e., prior to sleep deprivation), significant effects of condition were found for HSCL Interpersonal Sensitivity ( $F=5.8, P=0.017$ ) and PVT lapses ( $F=4.7, P=0.032$ ).
- PCA indicated that the 5 HSCL subscales clustered together (16.8% variance explained), and that KSS and PVT clustered together (57.1% variance explained) but with a pattern distinct from the HSCL. Only the KSS/PVT cluster showed an overall significant condition by time interaction ( $F=14.0, P<0.001$ ).

## Discussion

- Subjects in the sleep deprivation condition exhibited higher levels of self-reported symptomology, which remained elevated throughout the experiment but were below published norms for clinical samples.
- The temporal profiles of subjective symptoms were distinct from those of subjective sleepiness and psychomotor vigilance, suggesting symptoms may have been related to factors associated with the laboratory environment and/or condition assignment and not solely to the loss of sleep.