

Sleep during days with work stress compared to weekend sleep

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Conclusion

The weekend sleep is longer and contains more SWS even in the first part of the sleep. This could be a result of lower stress in the evening and a rebound effect of accumulated sleep deprivation during the week. Sleepiness during the day is not affected by the longer sleep.

Introduction

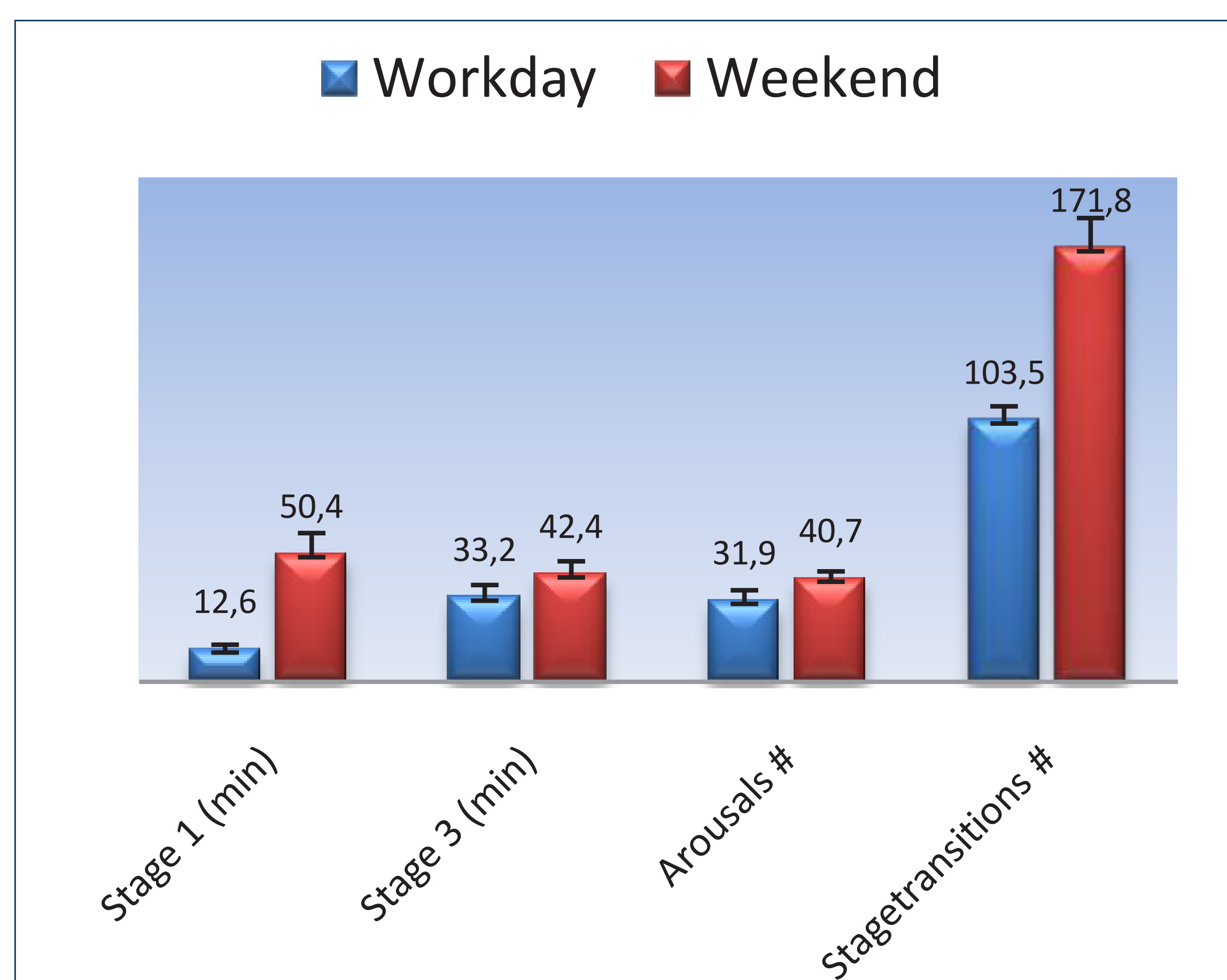
Stress is assumed to impair sleep but very few studies of naturally occurring variation in stress and polysomnography (PSG) have been carried out. The purpose of the present study was to compare sleep during a stressful workweek with sleep during the weekend.

Methods

Sleep was recorded at home in 28 teachers during one high stress and one low stress condition (and a habituation night). Probable upcoming stress levels were estimated through weekly ratings on a web questionnaire. 17 of them also completed a PSG recording of a weekend sleep (a workday followed by a day off). Participants also kept sleep diaries and wore actigraphs.

Results

There were no differences in bedtime but the weekend sleep was longer (376±14 for the workday and 447±19 for the weekend, $p<0.05$) contained more stage transitions/hour, higher number of arousals and more stage 1 and SWS. When the morning hours of the weekend sleep was cut to match the length of the workdays it still contained more stage 1 ($p<0.001$) and SWS ($p<0.01$) as well as more arousals ($p<0.05$) and stage transitions ($p<0.001$).



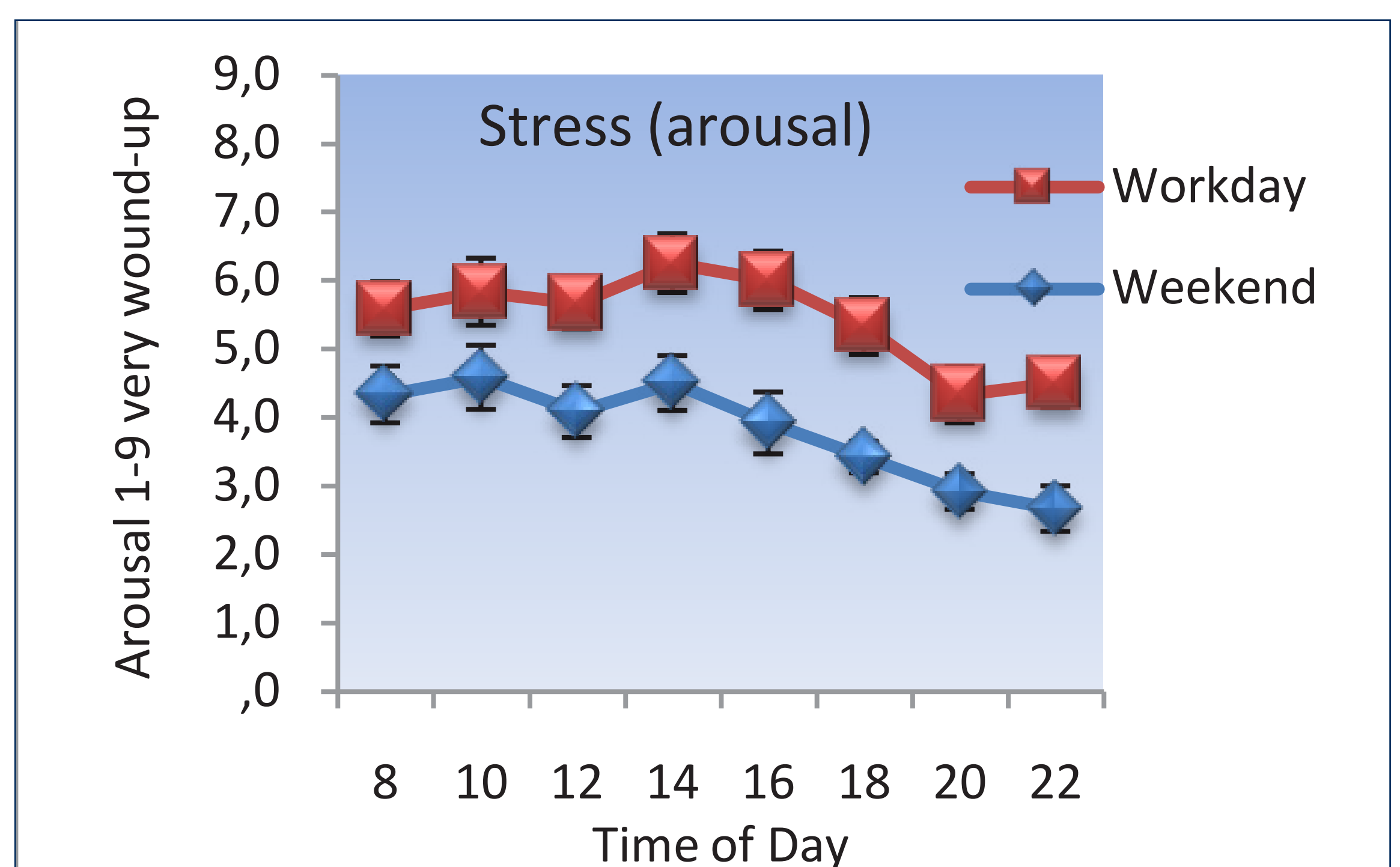
Means, standard error of the means and p-value for PSG-variables during workday and weekend sleep. * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Stress at bedtime as well as preoccupation with work was rated lower and the anticipation of the sleep was higher before the day off. There were no significant differences in sleep quality index; however the awakening index was higher and also cognitive functions was rated higher.

	Workday	Weekend	F
	mean±se	mean±se	
Stress at bedtime (1-5 low)	3.5±0.2	4.7±0.1	20.7***
Work preoccupation (1-4 low)	2.5±0.2	3.6±0.2	13.1***
Sleep quality index(1-5 good)	3.7±0.2	3.8±0.2	0.4
Awakeningindex (1-5=very good)	2.8±0.2	3.7±0.2	10.6**
Arousal level (1-9 high)	5.3±0.2	3.7±0.3	35.9***
Sleepiness (1-9 high)	4.7±0.2	4.6±0.3	1.7
Cognitive index (1-3= good)	2.4±0.2	3.0±0.0	6.6**

Means, standard error of the means and F-value for sleep diary ratings during workday and weekend sleep. * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Arousal levels rated every second hour during the day was significantly lower during the weekend. Sleepiness during the day following the weekend sleep was not affected.



Diurnal variation, mean±se of arousal levels during workday and weekend sleep.

Discussion

The increase in SWS could be a rebound effect of sleep deprivation during the week, however this is not likely to be the whole explanation since sleep latency or sleepiness levels in the evening did not differ. The increase in stage 1 sleep is also contradictory to common findings in recovery sleep. It seems likely that part of the increase in SWS could be a result of lower stress and less preoccupation with work in the evening interfering with sleep. The higher amount of arousals found in the weekend sleeps could be connected to the increase in SWS due to the higher rate of stage transitions between deeper and shallow sleep needed for the brain. The increase in arousals could in turn result in more stage 1 sleep since arousals are most commonly followed by stage 1.

Even though sleep was longer and rated as more refreshing in the morning sleepiness levels were not significantly lower during the day as expected. Arousal levels however were higher during the workday which could cause sleepiness to be suppressed.

CONTACT