

Circadian Light and Its Impact on Alertness in Office Workers

LRC researchers conducted a field study at two federal office sites to demonstrate whether circadian-effective lighting (circadian stimulus; $CS \geq 0.3$) could be installed in office buildings, and to determine whether this lighting intervention would increase alertness, vitality, and energy in office workers.

Thirty-six volunteers from the Veterans Affairs (VA) Medical Center in White River Junction, VT, and the Federal Highway Administration (FHWA) Turner-Fairbank Highway Research Center participated in the study.



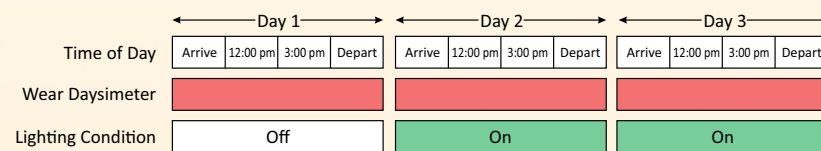
Lighting intervention. (left) An office worker uses a desktop luminaire; (right) Cree PoE Smartcast 2x2 troffers installed in an office workspace.

Researchers installed two types of circadian-effective lighting: (1) overhead lighting using a Power over Ethernet (PoE SmartCast; CREE Lighting) system, used only at the FHWA site; and (2) desktop luminaires. All types of lighting delivered $CS \geq 0.3$ at eye level.

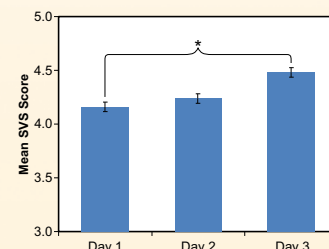
Baseline data were collected prior to turning on the lights on Day 1 and intervention data were collected on Days 2 and 3. On all three days, participants were provided with Daysimeters, calibrated personal light meters, to wear as pendants, and asked to fill out two questionnaires four times a day, the Karolinska Sleepiness

Scale (KSS) and Subjective Vitality Scale (SVS), probing their subjective sleepiness, vitality, and energy scores.

As the LRC hypothesized, self-reported sleepiness (KSS) scores were reduced and remained lower throughout the entire workday on Days 2 and 3 during the intervention, compared to baseline. This effect was almost statistically significant. In addition, participants reported feeling more vital, more energetic, and more alert during the intervention, compared to baseline, as shown by the significantly higher SVS scores on Day 3 compared to Day 1.



Protocol. Participants filled out KSS and SVS questionnaires at each interval shown for each day.



Mean \pm SEM SVS scores. Day 1: lights off, Days 2-3: lights on. * – statistically significant.

Sponsor

General Services Administration

Products loaned by Cree

