

Brief Blue-Light Exposure May Have Lasting Brain Benefits

Megan Brooks | June 16, 2016

DENVER — A single relatively short exposure to blue-wavelength light can increase subsequent activation in brain regions critical for successful working memory performance and improve response times, a new study suggests.

"Previous studies have shown that exposure to blue-wavelength light, which is similar to the type of light you get on a bright sunny day, leads to increases in alertness and better performance on reaction time tasks during the period of exposure," lead author Anna Alkozei, PhD, postdoctoral fellow in the Department of Psychiatry, University of Arizona in Tucson, told *Medscape Medical News*.

"Our study adds to this literature by showing that exposure to 30 minutes of blue light in comparison to 30 minutes of amber light led to subsequently better performance on a cognitive task 40 minutes after the blue-light exposure period had ended," Dr Alkozei explained.

She reported her research here at SLEEP 2016: 30th Anniversary Meeting of the Associated Professional Sleep Societies.

The study included 35 healthy adults (18 female; mean age, 21 years). They were randomly assigned to a 30-minute exposure of blue-wavelength light using the Philips *goLITE BLU Energy Light* device ($\lambda = 469$ nm) or amber (placebo) light, immediately followed by a working memory task (N-Back task) during functional MRI. All exposure was completed in the morning after a normal night of sleep.

"Individuals who received blue light vs amber light showed greater activation within the dorsolateral and ventrolateral prefrontal cortex during completion of the task, which are brain areas crucial for successful cognitive performance," Dr Alkozei said.

With increases in cognitive load, the blue-light group had faster reaction times ($P = .04$) and more efficient responding (ie, they answered more items correctly per second; $P = .01$).

"These findings are important as they link the acute behavioral effects of blue light to enhanced activation of key cortical systems involved in cognition and mental control," William Killgore, PhD, the senior author and principal investigator of the project, noted in a conference statement.

Dr Alkozei told *Medscape Medical News*, "Considering a wide range of research has shown that exposure to blue light during the day and at night leads to increases in alertness during the period of exposure, it could be used as a nonpharmacological way to improve attention in situations where alertness and quick decision-making are important."

"Our study," she added, "is the first study to suggest that exposure to blue light has a lasting effect on cognitive functioning for over half an hour after the period of light exposure ended. So while it may be beneficial to use blue light before having to engage in tasks that require you to stay alert and react quickly, such as testing situations, future research will be necessary to replicate our findings and to identify for how long these beneficial effects of blue-light exposure may last."

Saul Rothenberg, PhD, from the Sleep Center at Greenwich Hospital, Connecticut, who wasn't involved in the study, noted that other studies have also shown that blue light changes levels of alertness.

"The melanopsin receptors that are providing light information to the circadian system is most sensitive to blue light, so it's never going to be surprising that blue light has a strong effect on biological rhythms," Dr Rothenberg told *Medscape*

Medical News.

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