

*conference abstract*

*randomised controlled trial*

*people*

## **Sleep problems in teenagers reversed in just one week by limiting screen use**

Sleep in teenagers can be improved by just one week of limiting their evening exposure to light-emitting screens on phones, tablets and computers, according to findings to be presented in Lyon, at the [European Society of Endocrinology](#) annual meeting, [ECE 2019](#). The study indicates that by simply limiting their exposure to blue-light emitting devices in the evening, adolescents can improve their sleep quality and reduce symptoms of fatigue, lack of concentration and bad mood, after just one week.

Recent studies have indicated that exposure to too much evening light, particularly the blue light emitted from screens on smartphones, tablets and computers can affect the brain's clock and the production of the sleep hormone melatonin, resulting in disrupted sleep time and quality. The lack of sleep doesn't just cause immediate symptoms of tiredness and poor concentration but can also increase the risk of more serious long-term health issues such as obesity, diabetes and heart disease. Other studies have suggested that sleep deprivation related to screen time may affect children and adolescents more than adults, but no studies have fully investigated how real-life exposure is affecting sleep in adolescents at home and whether it can be reversed.

In this collaborative study between the Netherlands Institute of Neuroscience, the Amsterdam UMC and the Dutch National Institute for Public Health and the Environment, researchers investigated the effects of blue light exposure on adolescents at home. Those who had more than 4 hours per day of screen time had on average 30 minutes later sleep onset and wake up times than those who recorded less than 1 hour per day of screen time, as well as more symptoms of sleep loss. The team conducted a randomised controlled trial to assess the effects of blocking blue light with glasses and no screen time during the evening on the sleep pattern of 25 frequent users. Both blocking blue light with glasses and screen abstinence resulted in sleep onset and wake up times occurring 20 minutes earlier, and a reduction in reported symptoms of sleep loss in participants, after just one week.

Dr Dirk Jan Stenvers from the department of Endocrinology and Metabolism of the Amsterdam UMC says, "Adolescents increasingly spend more time on devices with screens and sleep complaints are frequent in this age group. Here we show very simply that these sleep complaints can be easily reversed by minimising evening screen use or exposure to blue light. Based on our data, it is likely that adolescent sleep complaints and delayed sleep onset are at least partly mediated by blue light from screens"

Dr Stenvers and his colleagues are now interested in whether the relationship between reduced screen time and improved sleep has longer lasting effects, and whether the same effects can be detected in adults.

Dr Stenvers comments, "Sleep disturbances start with minor symptoms of tiredness and poor concentration but in the long-term we know that sleep loss is associated with increased risk of obesity, diabetes and heart disease. If we can introduce simple measures now to tackle this issue, we can avoid greater health problems in years to come."

## Abstract

### P652

Restoring the sleep disruption by blue light emitting screen use in adolescents: a randomized controlled trial

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#### Introduction

Adolescents spend much time using blue-light emitting screen devices such as smartphones, tablets and computers. Blue light affects the central circadian clock in the suprachiasmatic nucleus (SCN) as well as melatonin secretion by the pineal gland. Screen use in adolescents strongly associates with reduced sleep quality and sleep duration. However, there is a lack of intervention studies that reduce blue light exposure due to screen use in adolescents.

#### Methods

We identified frequent screen users (use  $\geq 4$  hr per day,  $n = 25$ ) and infrequent screen users (use  $\leq 1$  hr per day,  $n = 30$ ) among Dutch adolescents aged 12-17 yr. In a 5-week randomized controlled crossover trial, the frequent screen users were assessed for 3 evening interventions of 1 week each, with 1-week washout periods: 1) during habitual screen use; 2) while wearing blue-light-blocking glasses; 3) while completely refraining from screen use. In a case-control sub-study, infrequent screen users were assessed for 1 week. In every measurement week, sleep was assessed using sleep diaries and actigraphy, and melatonin onset was assessed using at home 30-minute saliva sampling on the final evening of each intervention week. The trials were registered as NTR6712 (RCT) and NTR6722 (case-control).

#### Results

In frequent screen users, blue-light-blocking glasses as well as refraining from screen use induced an earlier mid-point of sleep compared to habitual screen use. Both interventions restored sleep times of frequent users to around those of infrequent users. In many subjects it was difficult to identify a clear-cut melatonin onset, but blue-light-blocking glasses reduced absolute melatonin levels compared to habitual screen use.

#### Conclusion

This is the first randomized controlled study in a real life setting showing that, among frequent screen using adolescents, blue-light-blocking glasses as well as abstinence of screen use restores their late sleep towards the earlier timing seen in infrequent screen users. These effects may be partly mediated via reduced melatonin suppression by blue light.

## Notes for Editors

1. The poster, “*Restoring the sleep disruption by blue light emitting screen use in adolescents: a randomized controlled trial*” was presented on Monday 20 May 2019, at the European Congress of Endocrinology at the Lyon Convention Centre, Lyon, France.
2. For other press enquiries please contact the ECE 2019 press office:

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3. The European Congress of Endocrinology was held at Lyon Convention Centre, Lyon, France on the 18-21 May 2019.
4. The [European Society of Endocrinology](#) was created to promote research, education and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators, and by any other appropriate means.