CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
38714

Project Title
Don't Let the Blue Light Bite: The Effect of Blue Light on REM Sleep

Abstract

Objectives/Goals
This project aimed to determine if exposure to blue light through screen time had any impact on the rapid eye movement (REM) sleep or the mood of a human sleeper.

Methods/Materials
Two Fitbit Alta HR devices, two Handheld devices with Fitbit app to collect sleep data, and a pair of Blue-light Filter Glasses. Fitbits were used to collect information on the various stages of sleep, with and without the use of Blue-light filter glasses by the participants during their exposure to electronic screens before they went to sleep.

Results
10 human subjects participated in the research. Exposure to blue light shortened the percentage of their REM sleep. The average of REM sleep for the blue-light exposure group was 21.19% of the total sleep, while the average for the non-exposure group was 23.11%, a difference equal to approximately 8 sleeping minutes. The mood, which was a potential risk during exposure testing, was, on the scale of 1 to 5, higher for the non-exposure days with an average of 4.50, slightly topping the exposure average of 3.81. The control group days were lacking about 2% of their usual REM sleep, and had a higher percentage average for the awake time (15.58%). The non-exposure tests had a decreased awake time percentage (13.43%). The data suggests that the REM sleep was compensated for awake time during exposure, and not all sleep stages were shortened by blue light.

Conclusions/Discussion
The results showed that the blue light exposure lessened the REM sleep by 2%, and caused corresponding increase in the awake time during sleep. I concluded that the blue light does negatively affect the REM quotient and the mood of a human sleeper.

Summary Statement
I found that the exposure to blue light through electronic screens before sleeping negatively impacts the REM quotient and the mood of a human sleeper.

Help Received
My elementary school science lab teacher Mr. Clyde Mann helped me come up with this interesting project idea during our science discussions.