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Effect of Blue Light Emissions on Sleep Quality in College Students

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Effects of Blue-Light Emitting Devices on Sleep Quality

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INTRODUCTION

- According to the Pew Research Center, the use of technology has increased exponentially over the past 25 years in the U.S (Hilton, 2020).
- A study conducted on medical students in Morocco showed that 97% of participants used a blue-light emitting device before bedtime, and that 35.3% of college students reported poor sleep quality (Jniene et. al. 2019).

Research Question:

- Is the use of blue-light emitting devices related to sleep quality in college students?

METHODOLOGY

- **Participants**
  - 83 college students recruited through the social media platforms Instagram and Snapchat
  - Mean Age = 20.34 (*SD* = 1.38)
  - Predominantly female (70.3%)
  - Predominantly Caucasian (86.8%)
- **Procedure**
  - Participants were instructed to complete a survey that included questions about demographics, blue-light device use, and questions from the Pittsburgh Sleep Quality Index (PSQI).
  - Participants used Qualtrics to take the survey on their devices.
- **Measures**
  - **Pittsburgh Sleep Quality Index** (Buysse, Reynolds, Monk, Berman, Kupfer, 1989): Higher scores reflect worse sleep quality on each of the subscales
    - Subjective sleep quality
    - Sleep latency
    - Sleep duration
    - Habitual sleep efficiency
    - Sleep disturbances
    - Use of sleep medication
    - Daytime dysfunction
  - Researchers used questions to measure blue-light device use and provide context on results:
    - Mood after waking (fatigue, irritability, headache)
    - Light adjustments on device
    - Sound settings on device
    - Light adjustments in room at night

Figure 1

Pearson's Test of Correlation: This figure shows the linear relationship between two quantitative, continuous variables

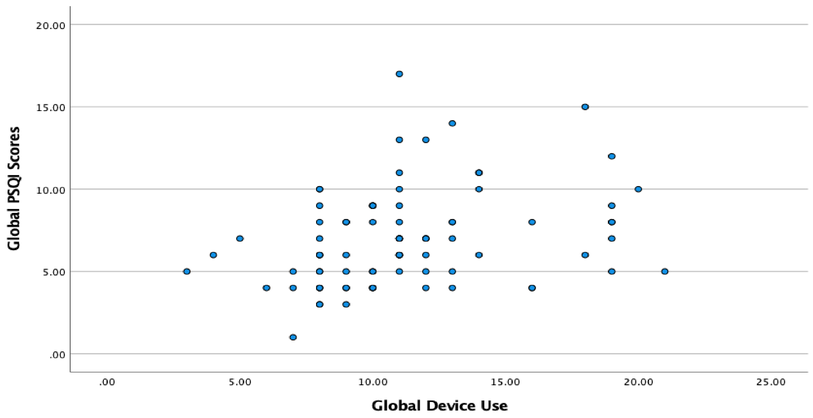

TABLE 1

Pearson Correlations

		Global PSQI Score	Global Device Use
Global PSQI Score	Pearson Correlation	1	.306**
	Sig. (1- tailed)	-	.002
	N	83	83
Global Device Use	Pearson Correlation	.306**	1
	Sig. (1-tailed)	.002	-
	N	83	91

** is significant at the .01 level (1-tailed)

TABLE 2

Descriptive Statistics: Means, standard deviations, and sample sizes of the quantitative, continuous variables

Descriptive Statistics

	Mean	Standard Deviation	Sample Size
Global PSQI Score	6.9398	3.75436	83
Global Device Use	11.2857	3.75436	91

RESULTS

- The correlation between blue-light device use and sleep quality was examined using a Pearson Correlation (Table 1).
- A positive correlation between device use and sleep quality was found, $r(n = 83) = .31$, $p = .002$ (Figure 1)
- Participants who reported a longer duration of blue-light emitting device use before bed, scored significantly lower than those who reported a shorter duration
- The effect size was small and approximately 9.36% of the variance in sleep quality was accounted for by blue-light device use

DISCUSSION

- The current results suggest that exposure to light impacts the body's natural circadian rhythm.
- Results of this study suggest that using blue-light emitting devices before bed has an impact on sleep quality.
- The results of this study should be interpreted in the context of limitations, such as the homogenous sample (predominantly 18-25 year old Caucasian female college students), the possibility of undiagnosed sleep disorders, and the effect of demand characteristics.

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