**Screen Time and Sleep Patterns Analysis**

**Hypotheses**

In my project, I will consider two different hypotheses, which are stated below.

**H0: There is no relationship between the daily screen time and quality of sleep. Higher screen time does not affect sleep quality.**

**Ha: The length and quality of the sleep is being negatively impacted by higher screen time during the day.**

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**H0’: Screen usage close to sleeping times has no impact on the amount of time it takes to fall asleep.**

**Ha’: Amount of time it takes to fall asleep is increased due to more screen usage close to sleeping times.**

**My dataset**

**A table of numbers with numbers in the middle

AI-generated content may be incorrect.**

A graph of a distribution of daily screen time

AI-generated content may be incorrect.

This histogram shows most days have total screen time between 180 and 300 minutes, clustering tightly around 240 minutes. The distribution is roughly symmetric, with only a couple of low usage days below 120 minutes and a few high usage days above 320 minutes. Overall, it shows moderate day-to-day variability around a four-hour average, with extreme low or high usage being rare.

A graph of a sleep quality score

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This histogram shows most sleep quality scores fall between 65 and 80, clustering tightly around 70–75. The distribution is roughly symmetric with only a couple of very low nights below 50 and a few exceptional highs above 90. Overall, it shows consistent, moderate-to-good sleep quality with extremely poor or excellent nights being rare.

A graph of different colored squares

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| **Pair** | **Pearson *r*** | **Interpretation** |
| --- | --- | --- |
| **Total Screen Time vs. Sleep Quality Score** | –0.12 | Weak negative linear relationship, more overall screen time is slightly associated with poor sleep quality. |
| **Nighttime Screen Time vs. Sleep Quality Score** | –0.18 | Still a weak negative correlation, suggesting that screen use closer to bedtime tends to be linked with a small drop in sleep quality. |
| **Nighttime Screen Time vs. Time to Fall Asleep** | 0.42 | Moderate positive relationship, higher screen usage at night is related to longer “fall asleep” latency, supporting Ha’. |
| **Total Screen Time vs. Time to Fall Asleep** | 0.33 | Modest positive correlation, indicating overall screen load tends to delay sleep onset. |
| **Total Sleep Minutes vs. Sleep Quality Score** | 0.11 | Very weak positive, implying longer total sleep may only slightly improve subjective quality. |

**Overview:**

* The negative correlations between screen‐time (especially at night) and sleep quality, while in the expected direction, are weak (│r│<0.2), indicating that other factors likely play substantial roles in determining quality.
* The moderate positive link between nighttime screen use and the time taken to fall asleep (r≈0.42) provides preliminary support for H₂: more evening and night screen exposure tends to delay sleep onset.
* Overall total screen time also shows a small to moderate tendency (r≈0.33) to prolong latency.
* Weak associations between total screen metrics and total sleep duration or quality suggest that cumulative daily use may be less impactful than the timing of use (i.e., close to bedtime).

A graph with blue dots

AI-generated content may be incorrect.

This scatter plot shows no clear trend between total screen time and sleep quality. Points are widely spread across all screen time values. Sleep scores hover around 70 regardless of whether screen use is low or high. A few high use days have lower scores, and a couple low use days have high scores, but overall, the cloud of points is nearly horizontal, confirming almost zero linear relationship.

A graph of a line graph

AI-generated content may be incorrect.

This series shows daily screen time swinging widely from around 130 up to 330 minutes while sleep quality stays in 47-100. Sometimes they move opposite (a big screen spike on April 9 doesn’t bring a clear drop in sleep quality), and other times both dip and peak together. Overall, there’s no consistent inverse pattern over time, reinforcing the weak temporal link between total screen use and nightly rest.

A graph with blue dots and a red line

AI-generated content may be incorrect.**Pearson Correlation**

*r* = 0.023, *p* = 0.889

***Interpretation****:* Almost zero correlation and a very large p-value mean we fail to reject H0. There’s no evidence of a linear link between total daily screen time and sleep quality in this dataset.

**Simple Linear Regression**

**Model:** Sleep Quality Score ~ Total Screen Time

**Slope** ≈ +0.0043 (*p* = 0.889) effectively zero change in quality per additional screen minute

**Intercept** ≈ 71.12 (expected sleep quality if screen time = 0)

**R²** ≈ 0.001 — only 0.1% of variance in sleep quality explained

**Conclusion**

Since p value is too large, we fail to reject H0. There is no clear evidence that cumulative screen time in a day affects sleep quality in this dataset.

A graph of a line with blue dots

AI-generated content may be incorrect.

**Pearson Correlation**

*r* = 0.464, *p* = 0.003

***Interpretation****:* A moderate, statistically significant positive correlation. We reject H0′ in favor of Ha’.

**Simple Linear Regression**

**Model:** Fall-Asleep Latency ~ Nighttime Screen Time

**Slope** ≈ +0.1054 (*p* = 0.003) each extra minute of nighttime screen adds about 0.105 minutes to sleep-onset latency

**Intercept** ≈ 8.98 minutes (baseline latency with zero nighttime screen use)

**R²** ≈ 0.216 — nighttime screen time explains ~21.6% of variation in latency

**Conclusion**

The analysis provides clear evidence that increased screen exposure before bed significantly delays sleep onset, supporting the alternative hypothesis Ha’. (*p* = 0.003)