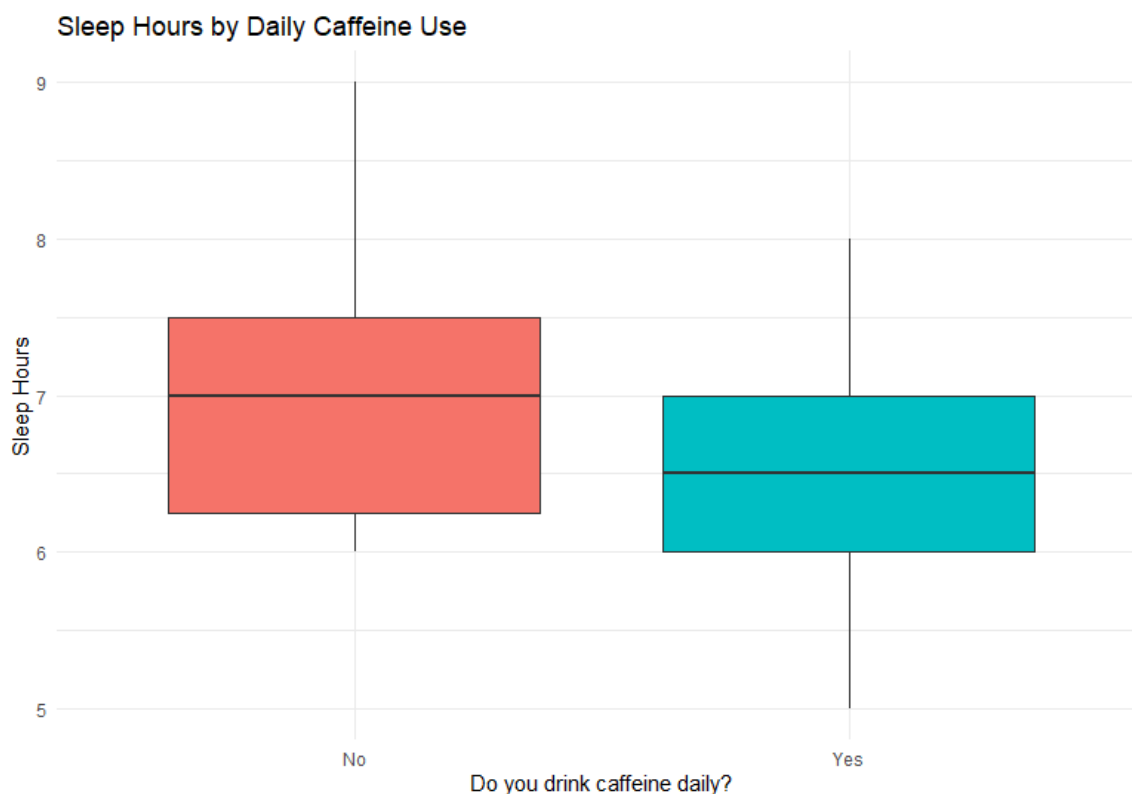


# Report: Sleep, Caffeine, and Energy

To better understand the relationship between caffeine use, sleep, and daily energy levels, I gathered survey responses from a group of 71 different adults. Each participant reported whether they drink caffeine daily, how many hours of sleep they typically get at night, and how they would rate their daily energy on a scale from 1 to 10. While the survey was not large enough to provide definitive population-level conclusions, it did yield interesting patterns that highlight how daily caffeine habits may be connected to both sleep and energy.

## 1. Does caffeine use relate to how much sleep adults get?

The first question I examined was whether adults who drink caffeine daily sleep less than those who do not. Figure 1 shows the distribution of nightly sleep hours for caffeine users compared to non-users. The two groups overlap quite a bit, but there is a noticeable trend: those who reported drinking caffeine daily tended to sleep slightly fewer hours on average.

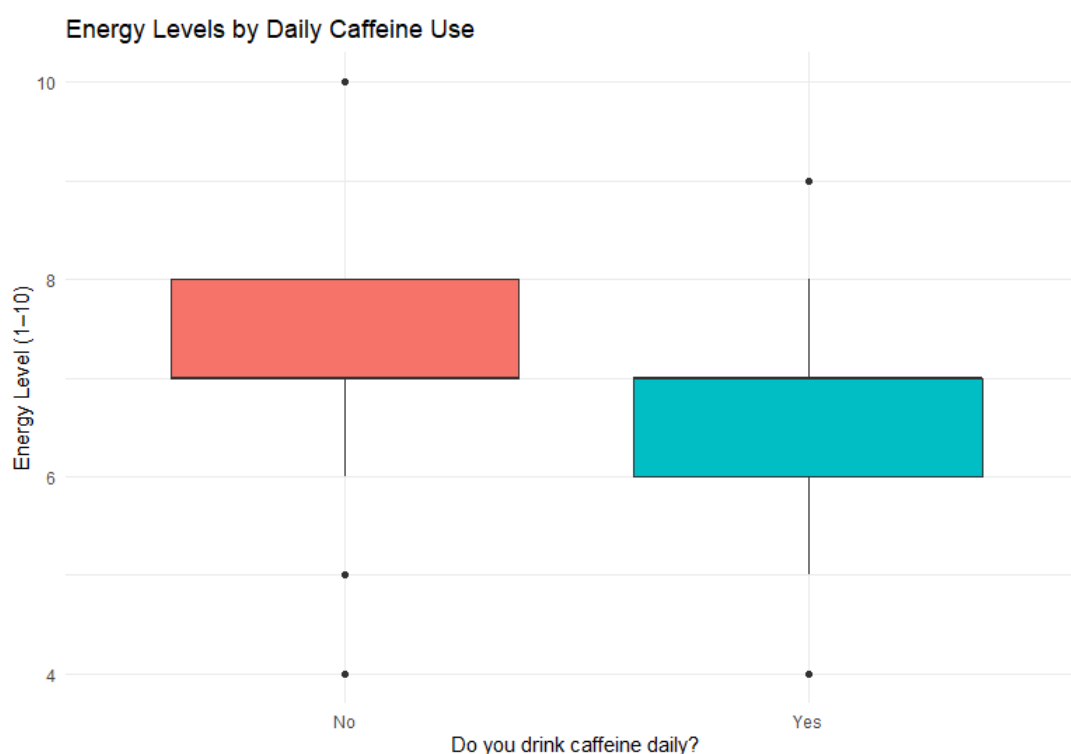


(Figure 1)

When we compared sleep patterns, we found that adults who avoid caffeine on a daily basis reported getting just over 7 hours of sleep per night, while those who drink caffeine every day averaged closer to 6.4 hours. That's a gap of about 40 minutes less sleep each night for daily caffeine users. This difference was not only noticeable but also statistically significant at the  $p$ -value of 0.05 ( $t = 2.59$ ,  $p$ -value = 0.014), with a 95% confidence interval suggesting the true gap is likely between 8 minutes and just over an hour.

## 2. Is caffeine associated with daily energy levels?

The second question was whether caffeine drinkers feel more energetic during the day. Figure 2 presents the reported energy levels by daily caffeine use. Interestingly, the results were somewhat counterintuitive: non-caffeine users reported slightly higher median energy levels than daily users.



(Figure 2)

When looking at energy levels, adults who don't drink caffeine daily reported feeling slightly more energized on average (7.20 out of 10) compared to those who do (6.60 out of 10). While this difference of about 0.6 points hints that non-caffeine users may feel more energized, the evidence wasn't strong enough to rule out chance according to a 0.05  $p$ -value ( $t = 1.82$ ,  $p$ -value =

0.079). The 95% confidence interval (−0.07 to 1.26) shows that the true difference could be close to zero or as large as more than a full point on the energy scale.

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## **Conclusion**

Although this survey was limited in size, the findings offer a useful snapshot of how daily caffeine habits might be connected to sleep and energy. Participants who drank caffeine every day slept about 40 minutes less per night, and this difference was statistically significant. When it came to energy levels, caffeine users did not report feeling more energized. The difference was small, leaned in the opposite direction, and was not statistically significant.

Overall, the results suggest that caffeine may be linked to reduced sleep without delivering the expected boost in daily energy. With a larger sample, the picture could become clearer. Even these preliminary findings point to the importance of questioning common assumptions about caffeine's effects.