

# The relationship between cognitive performance and sleep deprivation

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How are undergraduate students' scores on the comprehensive cognitive function task related to their sleep deprivation levels?

## Hypotheses

Sleep deprivation leads to cognitive dysfunctions like poor working memory and difficulties with decision making (Javaheipour et.al. 2019) .

- 1 Cognitive performance is correlated with sleep deprivation

OR

- Cognitive performance is not correlated with sleep deprivation

## Method

95 total participants

81 On-campus undergraduates

14 Off-campus undergraduates

## Materials (CCFT and CHICa)

A *Comprehensive Cognitive Function Test (CCFT)* is a 10-question tool created to test verbal, reasoning, and mathematical skills in the sample.

A *CHICa* scale is a standard tool which measures the effects of sleep deprivation. Ogniska, Mojsa, Fafrowicz & Marek (2014) indicated that sleep deprived individuals score the highest on the CHICa scale

**Design** – Correlational

**Procedure** – a survey with the two measures, CCFT and CHICa sleep scale, was put on the on-campus and off-campus online data collection resources for undergraduate students to take.

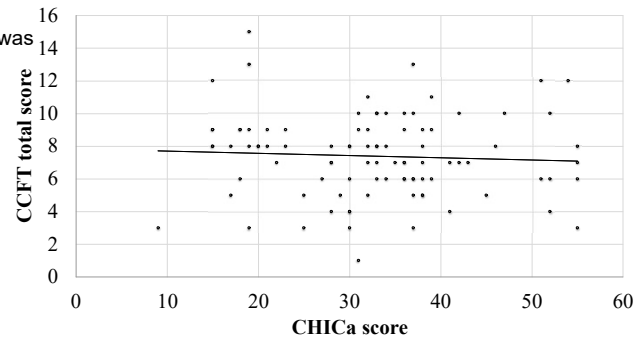
## Results

The average CCFT score was 7.39 ( $SD = 2.55$ )

The average CHICa score was 32.65 ( $SD=10.99$ )

There is a nonsignificant correlation between CCFT scores and CHICa scores  $r=-0.06$  ( $p=0.56$ )

Relationship between Cognitive performance and Sleep Deprivation



The results indicate a weak negative correlation between cognitive performance and sleep deprivation in undergraduate students. The total score on CCFT decreases with increase in sleep deprivation levels. However, this result was nonsignificant at 0.05

## References

- Javaheipour, N., Shahdipour, N., Noori, K., Zarei, M., Camilleri, J. A., Laird, A. R., ... Tahmasian, M. (2019). Functional brain alterations in acute sleep deprivation: An activation likelihood estimation meta-analysis. *Sleep Medicine Reviews, 46*, 64–73. <https://doi.org/10.1016/j.smrv.2019.03.008>.
- Ogniska, H., Mojsa, K. J., Fafrowicz, M., & Marek, T. (2014). Measuring individual vulnerability to sleep loss—The CHICa scale. *Journal of Sleep Research, 23*(3), 339–346. <https://doi.org/10.1111/jsr.12115>

## Discussion

The outcome is nonsignificant; however, this is inconsistent with prior research. Javaheipour et.al (2019) asserted that sleep deprived individuals show poor memory and poor executive functioning abilities.

CHICa scale only measures the effects of sleep deprivation, it is not fully diagnostic.

Data was collected at the beginning of the semester when most students are likely to have been getting healthy sleep.

## Future Directions

Next, I intend to be able to manipulate the sleep deprivation variable to further assess this relationship and reduce confounds.

By making use of a sleep lab to manage and accurately measure sleep, the research can be improved