An Evaluation of Student's Mental Health and Lack of Sleep

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Introduction

This report analyses data of student's mental health and wellness with a focus on a combined depressed, anxious, stressed score and the proportion of college students who pulled all-nighters. Additionally, this reports tries to answer the question *Do the majority of college students in this population pull all nighters?*.

The analysis is based on a survey of 253 college students from the University's liberal arts college[1]. The relevant variables from the survey for this report are *DASscore* and *AllNighter*.

DAS-score

The DAS-score is a combined score for depression, anxiety and stress, where higher values indicate mood complaints. Figure 1 shows the count for each DAS-score from the survey, while table 1 presents the summary statistics from the sample.
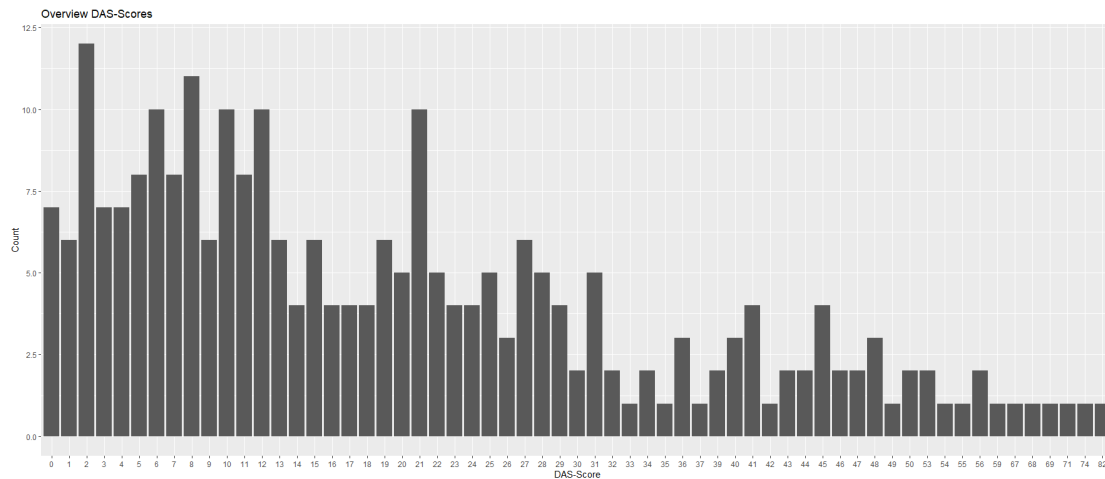

Figure 1: Overview DAS-scores

Using sampling with replacement, we calculate 10,000 bootstrap samples from the original sample and calculate a 95% confidence interval for the true population mean of the DAS-score as (-28.27392, 36.569). This means, we are 95% confident, that the true population mean of the DAS-score is in the range of (-28.27392, 36.569).

Table 1: Summary Statistics
DAS-score

Mean	4.147541
Median	16
Min. Value	0
Max. Value	82

Table 2: Count All-Nighter

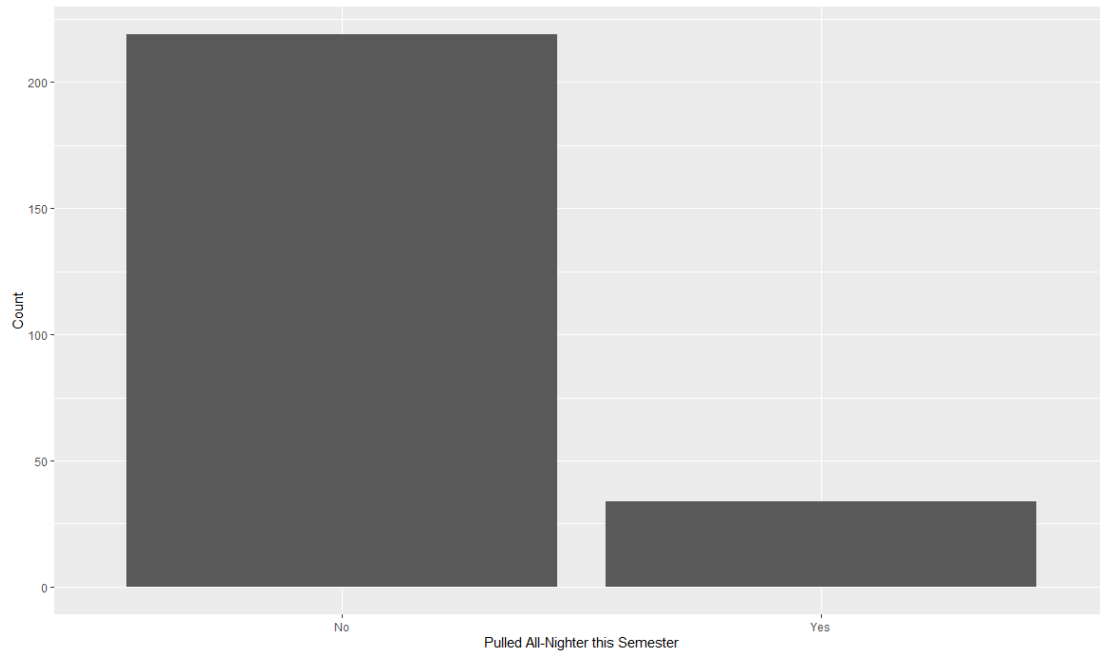|	Count	Percentage
Pulled an All-Nighter	34	13.44%
Not Pulled an All-Nighter	219	86.56%

Figure 2: Overview All-Nighter this Semester

Pulled All-Nighter this Semester

Figure 2 gives an overview of whether students have pulled an all-nighter this semester already, table 2 gives the equivalent information in a table. Using sampling with replacement, we calculate 10,000 bootstrap samples from the original sample and calculate a 95% confidence interval for the true proportion of students having pulled an all-nighter as (0.09236031, 0.1764144). This means, we are 95% confident, that the true proportion of students having pulled an all-nighter is in the range of (9.24%, 17.64%).

We conduct a hypothesis test to answer the question *Do the majority of college students in this population pull all nighters?*. Our null hypothesis is, that half the college students in this population pull all nighters ($H_0 : p_0 = 0.5$), while our alternative hypothesis is, that either more or less than 50% of the college students pull all nighters ($H_A : p_0 \neq 0.5$). We select a significance level of $\alpha = 0.05$.

[1]Onyper, S. V., Thacher, P. V., Gilbert, J. W., & Gradess, S. G. (2012). Class start times, sleep, and academic performance in college: a path analysis. Chronobiology International, 29(3), 318-335.

We calculate a *z-score* of -11.631, meaning that our data are more than 11 standard deviations away from a $p_0 = 0.5$. Our *p-value*, that shows the probability of seeing our sample or one more if the null hypothesis was true, is $p_{value} = 1.463*10^{-31}$, which means there is basically no chance of seeing our sample if the null hypothesis was true. Based on the *p-value* and the *z-score*, we reject our null hypothesis, that 50% of all college students pull all nighters. Based on the 95% confidence interval of (9.24%, 17.64%) for the true proportion of student who pull all nighters, we conclude that the minority of students in this population pull all nighters.

Limitations

Our results show a mean DAS-score of 4.15 with a median of 16 for our sample. Additionally, our results show that a minority of college students pull all nighters. The data of this sample was gathered from students of the liberal arts college which makes it not recommendable to generalize this data beyond liberal arts students from this university. Additionally, this sample is a small sample compared to the estimated population size, which is why we recommend another study with a bigger sample size. Lastly, the conducted survey does not specify how often students pull all nighters, while it makes a huge difference for once health, if someone pulls an all nighter once or regularly.