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Relationship Between Caffeine Use and the Total Hours of Sleep Per Week

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Relationship Between Caffeine Use and the Total Hours of Sleep Per Week

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VCU

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SPIT FOR SCIENCE
The VCU Student Survey

Introduction

Caffeine use is prominent throughout the country. In fact, some researchers report that caffeine is the most used drug in America[4].

Ever wonder how caffeine really works? Simply put, it's an enhancer drug. Caffeine functions in a way that it blocks the chemical that is responsible for feeling fatigue, adenosine[2].

- There is a growing trend regarding caffeine use, specifically coffee intake. A study reported by The National Coffee Foundation found that the number of 18- to 39-year-olds who drink coffee daily jumped almost 10% year-over-year in 2011[5].

- Survey data from a marketing research company, NPD Group, found that in 2002, about 25% of 18- to 24-year-olds reported drinking coffee (rather than soda) sometime within a two-week period. However, by 2012, the percentage had grown to 39%[1].

Research Question: What is the relationship between how much caffeine students are using and how much sleep they are getting?

Hypothesis: Students who use caffeine will report fewer hours of sleep than students who do not.

Methods

Spit for Science is a VCU-wide, longitudinal research initiative that wants to better understand how genetic and environmental factors come together to influence a variety of health-related outcomes in the VCU undergraduate population.

Independent variables: Caffeine use
Questions asked:
- "Do you drink any caffeinated beverages?" (yes/no)
- "In the last month in a typical week on how many days did you drink coffee?"
- "In the last month in a typical week on how many days did you drink caffeinated soda?"

Dependent variable: Total hours of sleep per week
- Two questions, based on the Pittsburgh Sleep Quality Index (PSQI) [3]
  - "How many hours of sleep" and "how many minutes of sleep do you typically get per night?"
  - Sleep recoded into total hours/week

Samples:
- First year fall semester survey (n=1799), Third year spring semester survey (n=1918), Fourth year spring semester survey (n=859)
 - 37% Male, 63% Female (the other respective cohorts had similar gender breakdown)

Statistical Tests:
- Independent sample t-tests were performed within each survey to examine caffeine use vs. total hours of sleep per week
- Correlation tests performed on soda and coffee vs. total hours of sleep per week
- Linear regression performed on both coffee use vs total hours of sleep per week and soda use vs total hours of sleep per week
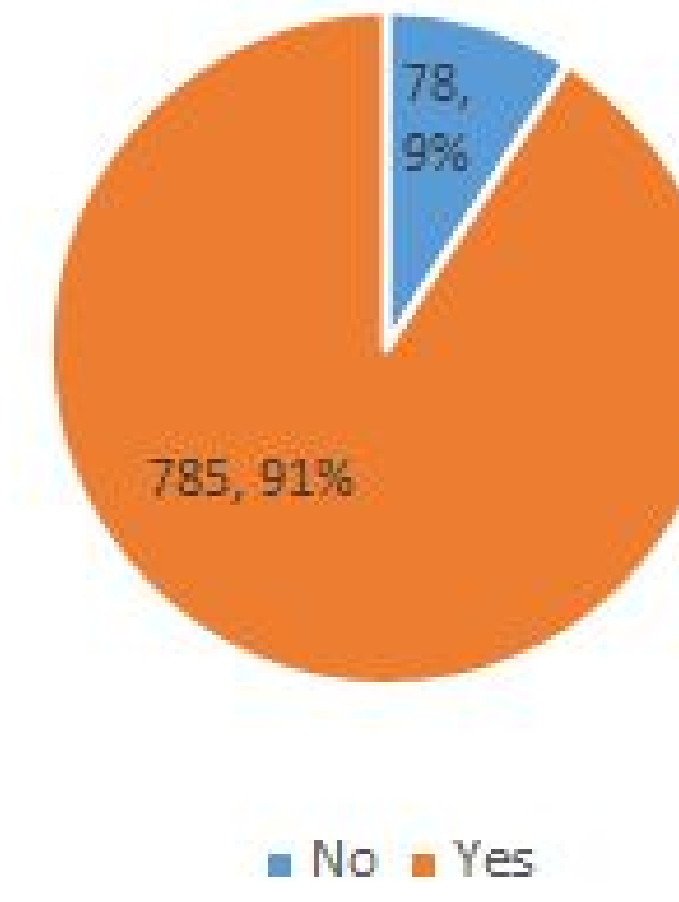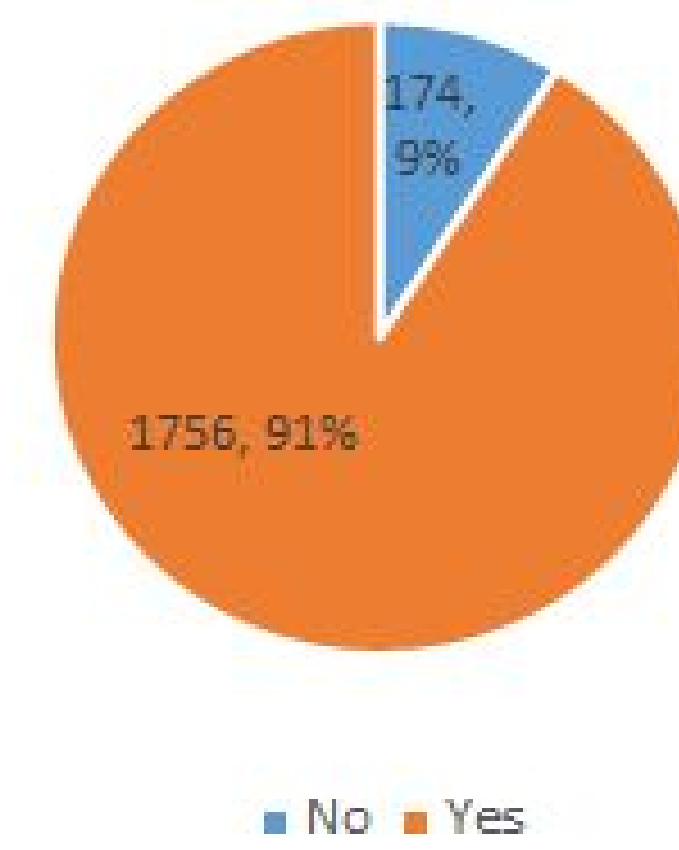
Results

Frequencies of caffeine use

Do you drink caffeinated beverages?
First Year Fall Semester
1043, 13%
6767, 87%
■ No ■ Yes
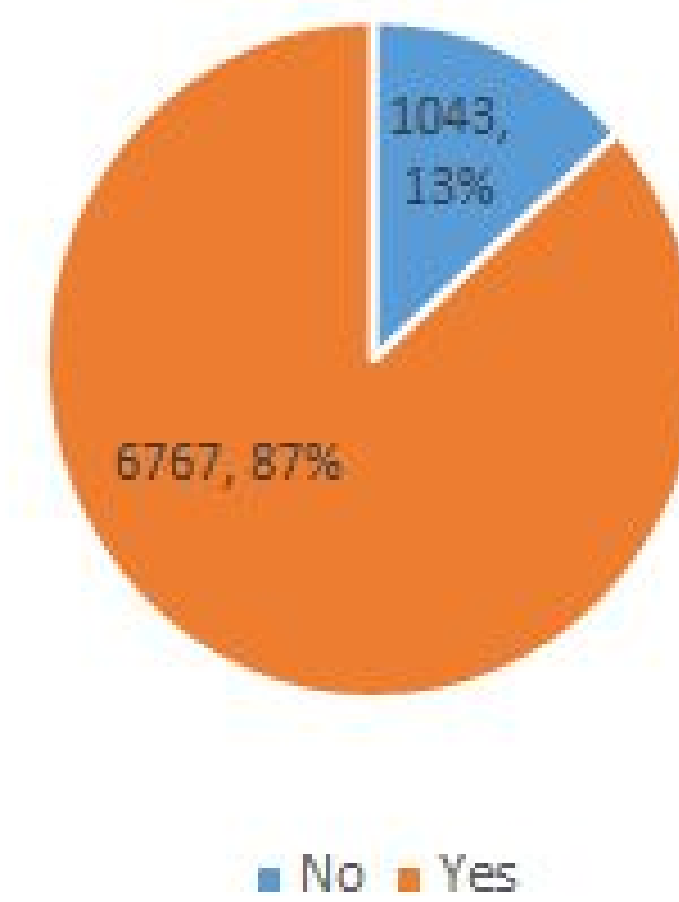
Do you drink caffeinated beverages?
Fourth Year Spring Semester
78, 9%
785, 91%
■ No ■ Yes

Do you drink caffeinated beverages?
Third Year Spring Semester
174, 9%
1756, 91%
■ No ■ Yes

Average total hours of sleep per week: First year fall semester (49.86 hours), Third year spring semester (48.01 hours), and Fourth year spring semester (47.83 hours)

Independent sample t-tests results on caffeine use vs. total hours of sleep per week:
- First year fall semester (p=0.193)
- Third year spring semester (p=0.041)
- Fourth year spring semester (p=0.034)
  - Third year and fourth year spring semester were found to be statistically significant (p< 0.05), and suggests there is a mean difference in total hours of sleep between non-users and caffeine users, with caffeine users sleeping less

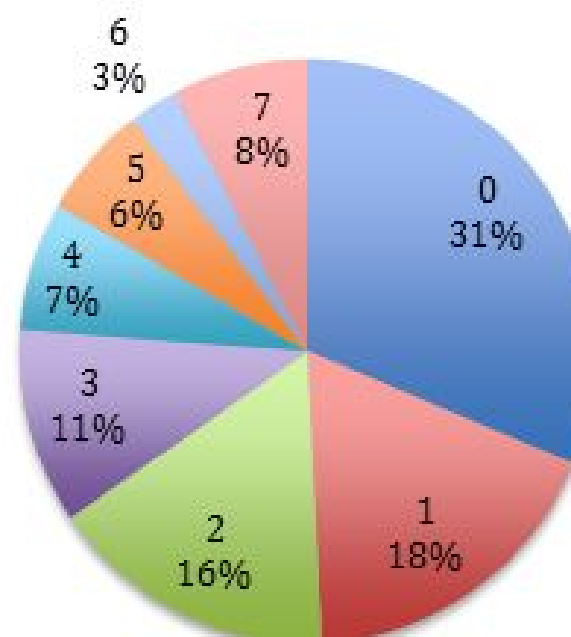### Frequencies of Drinking Caffeinated Soda

In the last month in a typical week how many days did you drink caffeinated soda?
First Year Fall Semester
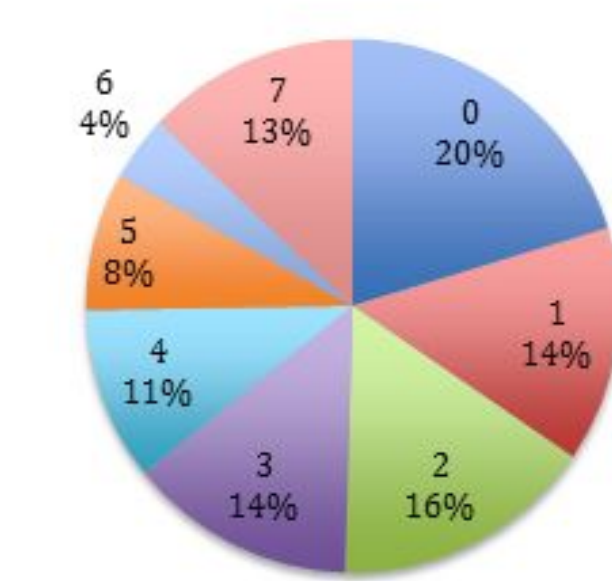
In the last month in a typical week how many days did you drink caffeinated soda?
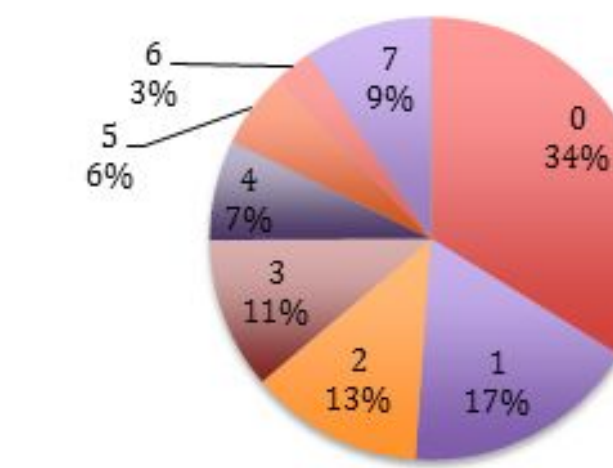*Fourth Year Spring Semester*
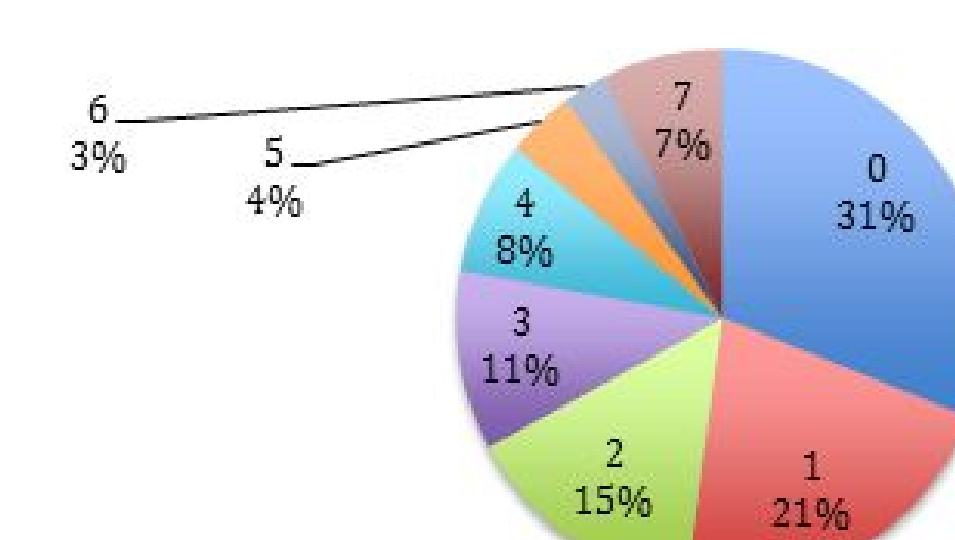
In the last month in a typical week how many days did you drink caffeinated soda?
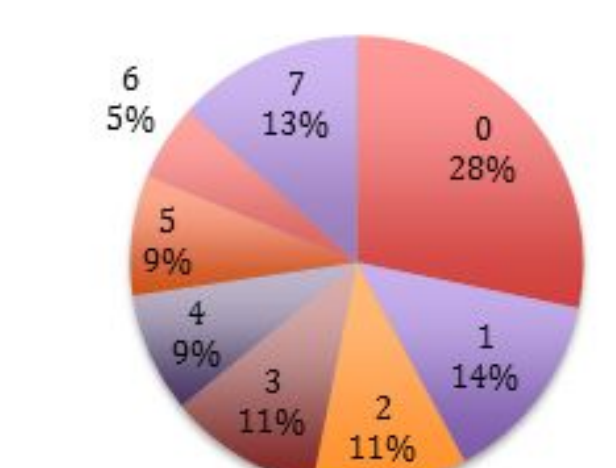*Third Year Spring Semester*

There is a growing trend of drinking less caffeinated soda in a typical week.
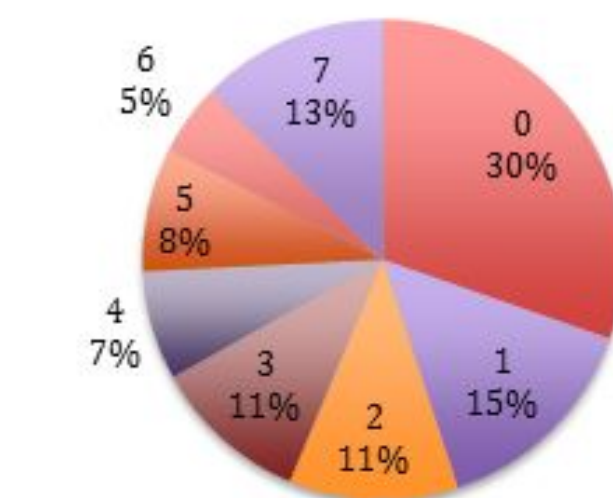
Frequencies of Drinking Coffee

In the last month in a typical week how many days did you drink coffee?
First Year Fall Semester

In the last month in a typical week how many days did you drink coffee?
Fourth Year Spring Semester

In the last month in a typical week how many days did you drink coffee?
Third Year Spring Semester

The percentages of those who do not drink coffee shows a gradual decrease.

Linear Regression results for caffeine use and total sleep
- First year fall semester: Caffeine use (coffee) and total hours of sleep per week were significantly associated (B=-0.514, p<0.01)
- For every unit increase in coffee drinking, sleep decreased by about 0.5 hours/night
- Third year spring semester and fourth year spring semester not statistically significant

Linear regression results for caffeinated soda and total sleep showed no relationship.

Discussion

The main intention of this research was to better understand the relationship between students' caffeine use and their total hours of sleep. I hypothesized that caffeine use would be associated with fewer hours of sleep.

Findings
- For the third year and fourth year spring semester, there was an association whereby caffeine users report less sleep than non-users
- Coffee drinkers report less sleep than non-coffee drinkers
- Students are trending towards more coffee use than caffeinated soda

Limitations
- Only used surveys
- Targeted VCU students
- The actual amount of caffeine (mg) is unknown

Future Directions
- Examine gender differences
- Quantify amount of caffeine (mg) consumed a week and re-run analyses

References

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Acknowledgements