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We wanted to see if there was a correlation between sleep and/or caffeine and students' grade point average (GPA). To do this we surveyed 101 Lindenwood undergraduate students. We asked them how much caffeine they consumed in a day, how much sleep they get within a seven day period, and their GPA, as well as basic demographic questions. Our study found that there was a weak negative relationship between sleep and GPA whereas no relationship between caffeine consumption and GPA. We conclude that since no relationship has been found, we have made suggestions on how to investigate further given some of the limitations of our study.

The Grade Point Average (GPA) is the best and simplest indicator of a person's educational success as a college student. We feel that two major challenges preventing a college student from maintaining a high GPA could involve getting the right amount of sleep each night, and using the consumption of caffeine as a method of staying awake longer. A correlation has been found showing that students who do not get enough sleep are less psychologically healthy than those who do get enough sleep (Kelly, 2004). Another study showed that at least 73 percent of college students surveyed had sleep issues (Buboltz, Brown & Soper, 2001).

Young adults are among the largest group of individuals that are sleep deprived (Forquer, Camden, Gabriau & Johnson, 2008). This sleep deprivation has been shown to have negative effects on academic performance (Forquer, et al). A majority of people who consume caffeine were found to drink mostly coffee and tea (Brice & Smith, 2002).

Brown and Buboltz state that sleep difficulties go beyond simply getting insufficient sleep to include not getting the right kind of sleep (2001). For example, students who do not get adequate amounts of REM, or rapid-eye movement sleep, perform significantly worse recalling newly learned information than students who had normal sleep or missed non-REM sleep stages (2002). Caffeine has been shown to reduce total sleep time in deep sleep and increase the amount of time in stage 1 sleep, or the first part of sleep when you become drowsy (Carrier et al, 2007). We believe that caffeine consumption can alter GPA through getting less than the desired amount of quality sleep. Caffeine is shown to impact daytime sleep more so than nocturnal sleep (Carrier et al, 2007).

We hypothesized that people who get fewer hours of sleep and consume a substantial amount of caffeine in a day will have a lower GPA. We believe that less than the average amount of sleep a person is supposed to have each night, less than eight hours as stated by Forquer et al, will impact their GPA score negatively. We also believe that a person's GPA can be altered by substantial amounts of caffeine and sleep deprivation. Studies show that there are consequences to psychological functioning due to sleep deprivation (Anonymous, 2008).

Method

Participants

Some of our participants came from the Human Subject Pool (HSP), and the rest from classes, pending professor approval. The HSP consists of undergraduate students that are enrolled in 100 level psychology, sociology, and anthropology courses. We recruited 101 participants, 45 being male and 56 being female, approximately ages 18 to 30, 30 coming from upper level classes and 71 from lower level classes. All students

were enrolled at Lindenwood University in the undergraduate program. The students that we recruited through the HSP received extra credit for the course that they were enrolled in. All students that were involved in our study, both from the HSP and from classes, got a piece of candy for participating in our study.

Materials

The materials that were used in our study was a desk that had four chairs, all of the necessary paperwork (read procedure), and pens to fill out our survey with.

Procedure

To recruit our participants we put up a printed out a signup sheet (Appendix A), and description of the experiment (Appendix B), to place on the Human Subject Pool board. We also got permission from faculty members to ask their students if they would like to participate in our study.

To begin the experiment we will start by having the participant(s) sit down and fill out the informed consent forms (Appendix C), one of which we retained and the other they kept. If they were in the Human Subject Pool they also filled out the list of participants sign in sheet. Then we briefly described our experiment for them, and asked them to fill out our survey that consisted of questions that ask them about their sleep habits, caffeine consumption and GPA, along with other demographic questions (Appendix D). Once they had completed the survey, they were given a feedback letter (Appendix E), and if they were part of the Human Subject Pool, they got their participant's receipt to receive extra credit, and then they were free to leave. Please note that the participants were assigned a random number to ensure confidentiality.

Results

An analysis of a Pearson Correlation was performed on participants' responses to our questionnaire revealed that there was no relationship found in our study. For the correlation of total ounces of caffeinated drinks and GPA *r*=.000. We suspected that students that had higher amounts of caffeinated drinks in a day would have a lower GPA. The correlation for hours of sleep in a seven day period and GPA *r*= -.152. We also suspected that students that got fewer hours of sleep in a week's time would have a lower GPA. The mean for ounces was 23.6931 and a standard deviation of 17.70127. The mean for GPA was 3.6832 with a standard deviation of .56446. The mean for hours of sleep in a seven day period ranged from 41 hours to 50 hours with a standard deviation of .794. We altered all of the caffeinated drinks in to ounces for the measurement. We had originally used terms such as cups and drinks. For the amount of sleep we had the participants average how many hours they got in a seven day period, not per night.

Discussion

We hypothesized that people who get fewer hours of sleep and consume a substantial amount of caffeine in a day will have a lower GPA. Our findings did not implicate that lower amounts of sleep and higher amounts of caffeine correlated with GPA in a positive or negative way. We concluded that there was no relationship between caffeine and GPA. We simultaneously concluded that sleep had a weak, negative relationship with GPA.

Our findings contrasted Kelly's findings, in which he found significance between sleep deprivation and the participants' psychological health (Kelly, 2004). Buboltz, Brown and Soper also found that seventy-three percent of college students have sleep

difficulties, but our study did not find that sleep issues negatively impacted their GPA (2001). Our hypothesis was supported by past research conducted by Forquer, Camden, Gabriau, and Johnson, however our findings suggest more research must be done to fully determine significance (2008). Brice and Smith's findings were similar to ours in that neither study found a correlation between caffeine consumption in relation to other measures that were assessed (2002).

One limitation we found in our study was that we did not have a large enough sample of upper classman surveyed. Only 30 of 101 participants had upper classman status. We believe that if there were more students of upper classman status there would have been a better range and possibly shown a correlation. The other main limitation found was that all the GPAs were self-reported, and not collected officially through the registrar. Self-reporting does not always give accurate information.

We found several portions of our study that could be improved or changed for future studies to be conducted. One would be to make sure that all types of caffeine are converted to the same amount, such as ounces, to make statistical analysis go more smoothly. In our study, different forms of measurement were used, and had to be converted to the same type of measurement to be combined and computed for analysis. We also needed to clarify exactly how many ounces constituted one cup of a caffeinated drink in our questionnaire. The last part of our study that we would change for future studies would be when we conducted our study. Most of our participants were surveyed around midterm exams, so testing them at the beginning of the semester or during the summer could have an impact on the results.

In conclusion, we found no correlation between sleep, caffeine, and GPA. No relationship was found between caffeine and GPA, and there was a weak, negative relationship between sleep and GPA. Future studies should be conducted with a larger, more representative sample of college students to determine whether sleep and caffeine amounts do definitively correlate with their GPA.

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Author Note

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Appendix A

Description:

In this study, you will be asked to complete a questionnaire asking you to report on such things as your sleep habits, caffeine intake, as well as your GPA. The entire procedure should take no more than 10 minutes of your time.

Appendix B

Sign-up Sheet

Project #: ____09-18_____
Experiment Name: Can normal habits correlate with your GPA?
Place: _____

Date	**Times**	**Name (please print)**	Must give 1: **Phone # or e-mail**	Best time to **be reached**	**Professor**	Class **Day & Time**	Experimenter **Responsible**
10/14	12:30						Hildebrand and Thurman
10/14	12:40						Hildebrand and Thurman
10/14	12:50						Hildebrand and Thurman
10/14	1:00						Hildebrand and Thurman
10/14	1:10						Hildebrand and Thurman
10/14	1:20						Hildebrand and Thurman
10/14	1:30						Hildebrand and Thurman
10/14	1:40						Hildebrand and Thurman
10/14	1:50						Hildebrand and Thurman
10/14	2:00						Hildebrand and Thurman

Appendix C

Informed Consent Form

I, _____ (print name), understand that I will be taking part in a research project that requires me to complete a questionnaire asking about how much caffeine I intake in a day, how many of hours of sleep I get a day, and my GPA. I understand that I should be able to complete this project within 5-10 minutes. I am aware that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I should not incur any penalty or prejudice because I cannot complete the study. I understand that the information obtained from my responses will be analyzed only as part of aggregate data and that all identifying information will be absent from the data in order to ensure anonymity. I am also aware that my responses will be kept confidential and that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher(s) involved to my satisfaction. Finally, I verify that I am at least 18 years of age and am legally able to give consent or that I am under the age of 18 but have on file with the HSP office, a completed parental consent form that allows me to give consent as a minor.

_____ Date: _____
(Signature of participant)

_____ Date: _____
(Signature of researcher obtaining consent)

Student Researchers' Names and Numbers

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Appendix D

*ID#*_____

Questionnaire

1. Please circle one. Are you a MALE or FEMALE?

2. Please circle one. Are you a FRESHMAN SOPHOMORE JUNIOR SENIOR OTHER?

3. Do you drink caffeinated coffee? YES NO

If yes, how many cups do you have in a 24 hour period on average? _____

4. Do you drink caffeinated soda such as Pepsi, Coke, Dr. Pepper? YES NO

If yes, how many ounces do you have in a 24 hour period on average?

For example 12 oz, 20 oz… _____

5. Do you drink other beverages that contain caffeine, such as tea, and energy drinks? YES NO

If yes how many cups/ ounces do you have in a 24 hour period?

_____

6. On average how many hours of sleep do you get in a week? _____

7. What is your current GPA as of this semester at Lindenwood (if you are a first semester freshman, what was your GPA when you graduated high school)?

_____

8. How many semesters have you attended Lindenwood? _____

9. Do you think the amount caffeine you receive a day affects you GPA in a positive or negative way? Please explain why you think your caffeine consumption affects your GPA in a positive or negative way.

_____

_____

_____

_____

10. Do you feel the amount of sleep you do get affects your GPA in a positive or negative way? Please explain why you think the amount of sleep you receive affects your GPA in a positive or negative way.

_____

_____

_____

_____

Appendix E

Feedback Letter

Thank you for participating in our study. The questionnaire was used in order to determine the relationship between the consumption of caffeine consumed and how many hours of sleep one gets in a day and how they correlate with GPA.

Please note that we are not interested in your individual results; rather, we are only interested in the results of a large group of consumers, of which you are now a part of. No identifying information about you will be associated with any of the findings.

If you have any questions or concerns regarding any portion of this study, please do not hesitate to bring them up now or in the future. Our contact information is found at the bottom of this letter. If you are interested in obtaining a summary of the findings of this study at a later date, please contact us and we will make it available to you at the completion of this project.

Thank you again for your valuable contribution to this study.

Sincerely,

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