

# Caffeine Consumption Among College Students

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## Introduction

Caffeine functions as a central nervous system stimulant that has a chemical formula of  $C_8H_{10}N_4O_2$ . Caffeine is a staple in many people's lives, including college students, with self-reported usage at strikingly high in the United States (Maqsood et al., 2020). According to the Washington Post, two billion cups of coffee were consumed per day worldwide in 2015 (Muacevic & Adler, 2021).

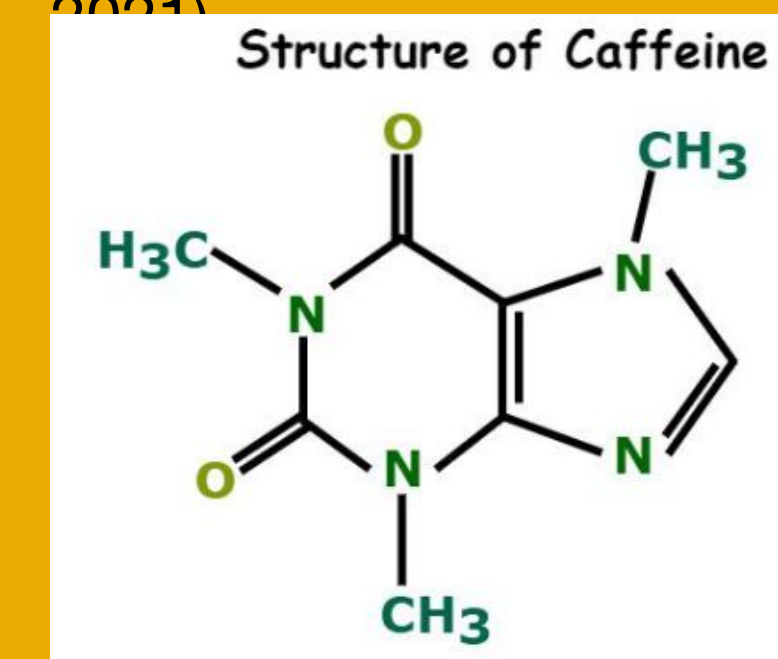


Fig. 1. Represented in this image is the chemical structure of Caffeine. Image derived from

## Purpose

To assess potential need among college students in terms of caffeine knowledge, consumption, and performance

## Materials and Methods

### Participants

- Voluntary and anonymous
- Current Concordia College undergraduate & graduate students
- 18 years of age or older
- Completed informed consent

### Survey

- Developed using Qualtrics Survey Software
- Consisted of:
  - 23 questions (estimated duration: 10-15 minutes)
  - Demographics and general questions
  - Assessment questions

### Procedures

- Approved by Concordia College Institutional Review Board
- Survey distributed through campus email to all Concordia College students
- Survey was open between December 2-13, 2024

### Research Questions:

1. What knowledge do college students have about caffeine?
  - 1a: Is there a relationship between knowledge of caffeine and academic performance?
2. What does caffeine consumption look like among college students?
  - 2a: Is there a relationship between caffeine consumption and academic performance in college students?
3. What is the behavior related to caffeine consumption among college students?
  - 3a: Is there a relationship between behaviors related to caffeine consumption and academic performance?

## Results

A total of 297 participants completed the survey, which represented a response rate of 15.9%. Data, were downloaded from Qualtrics and then analyzed using the Statistical Package for Social Sciences, version 29.0.1.0, 2024.

### Participant Demographics

Gender	n	%
Male	85	28.6%
Female	198	66.7%
Non-Binary or Third Gender	12	4.0%
Prefer not to say	2	0.7%

### Knowledge of Caffeine

20-100 mg	34-54 mg	50-80 mg	75-150 mg	68-200 mg
Dark chocolate bars	Soda	Caffeinated juices	Espresso	Energy drinks

Table 2 shows the correct answers to how many milligrams of caffeine are in each beverage. Responses in red indicate most participants answered incorrectly; responses in green indicate most participants answered correctly.

### Item(s) that naturally contain caffeine

-Coffee	$n = 273$
-Green tea	$n = 260$
-Chocolate	$n = 195$
-Kombucha	$n = 146$
-Protein bars	$n = 41$

### Symptoms related to withdrawing from caffeine

-Headaches, muscle pain, drowsiness, fatigue, irritability, poor mood	$n = 228$
-Shaky hands, anxiousness, rapid heartbeat	$n = 20$
-Difficulty falling asleep, restlessness, trouble concentrating	$n = 28$

### Recommended maximum daily caffeine intake (adults)

-100 mg/day	$n = 49$
-200 mg/day	$n = 98$
-400 mg/day	$n = 96$

### Consumption of Caffeine

Mg/day	n	%
0	22	7.4%
1-50	37	12.5%
51-100	64	21.5%
101-150	51	17.2%
151-200	38	12.8%

### Consumption of Caffeine (continued)

#### Weekly Caffeine Consumption

**Coffee**  
 -None  $n = 100$   
 -1-2 servings  $n = 61$   
 -3-4 servings  $n = 43$

**Tea**  
 -None  $n = 165$   
 -1-2 servings  $n = 63$   
 -3-4 servings  $n = 27$

**Energy Drinks**  
 -None  $n = 117$   
 -1-2 servings  $n = 61$   
 -3-4 servings  $n = 37$

#### Soda

-None  $n = 127$   
 -1-2 servings  $n = 73$   
 -3-4 servings  $n = 33$

#### Caffeine Pills

-None  $n = 265$   
 -1-2 servings  $n = 7$

#### Caffeinated Foods

-None  $n = 152$   
 -1-2 servings  $n = 81$   
 -3-4 servings  $n = 30$

Most students ( $n = 176$ , 59.3%) stated their caffeine consumption had increased since becoming a college student.

### Behaviors related to Caffeine Consumption

When participants were asked what time of day they consume caffeine, 52.2% indicated between 5:00 a.m. - 10:59 a.m. ( $n = 155$ ), while 23.2% indicated between 11:00 a.m. - 3:59 p.m. ( $n = 69$ ).

When do you consume caffeine?	n	%
<b>When studying</b>	<b>186</b>	<b>62.6%</b>
<b>When doing homework</b>	<b>184</b>	<b>62%</b>
<b>When in class</b>	<b>174</b>	<b>58.6%</b>
Before a test	68	22.9%
When driving	122	41.1%
<b>When socializing with friends</b>	<b>150</b>	<b>50.5%</b>

Caffeine makes me anxious  $n = 87$  strongly agreed  
 Caffeine makes me alert, energized, and less sleepy  $n = 136$  somewhat agreed

Caffeine makes me think clearly, pay more attention, and sharpen memory  $n = 136$  somewhat agreed

When do you prefer to have caffeine?	n	%
Before eating	33	11.1%
While eating	64	21.5%
After eating	53	17.8%
<b>Separate from eating</b>	<b>99</b>	<b>33.3%</b>
Other	21	7.1%

#### RQ 1a: No correlation

-Recommended max intake and GPA:  $r(271) = -0.55$ ,  $p = 0.368$   
 -Symptom withdrawal and GPA:  $r(274) = 0.024$ ,  $p = 0.691$

#### RQ 2a: No correlation

-Consumption and college GPA:  $r(271) = 0.001$ ,  $p = 0.986$   
 -Consumption and HS GPA:  $r(40) = -0.137$ ,  $p = 0.40$

#### RQ 3a: Negative correlation

-Energy drinks and HS GPA:  $r(38) = -0.354$ ,  $p = 0.025$   
 -Soda and college GPA:  $r(273) = -0.13$ ,  $p = 0.033$

## Conclusion

There is a knowledge gap surrounding caffeine consumption. While college students are knowledgeable about certain characteristics of this stimulatory drug, students are not as knowledgeable in terms of caffeine content (milligrams) of foods and beverages.

No correlations were found between knowledge of caffeine and academic performance (GPA) and consumption of caffeine and academic performance. However, a negative correlation was found between behaviors related to caffeine consumption and academic performance. More specifically, as energy drink consumption increased, high school GPA (first-year college students) decreased, and as soda intake increased, college GPA decreased.

A curriculum-based program tailored towards college students would be ideal as this study showed a need for education among college students on the caffeine content of foods and beverages and the relationships between caffeine consumption and academic performance.

## References

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## For further information

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