Research Article

Caffeine Consumption and the Effects on University Students' Performances in Petaling, Selangor

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Abstract
This study examines caffeine consumption and its effects on university students' performance in Petaling, Selangor. Caffeine has long been associated with enhancing cognitive functions and improving task performance. Many students rely on caffeinated beverages to cope with academic pressure and maintain productivity, yet their overall impact remains debated. To explore this issue, 400 survey responses were collected through a self-administered questionnaire from students attending public and private universities in Petaling, Selangor. Findings indicate that caffeine consumption positively influences academic performance by extending study time, assisting in task completion, and enhancing attentiveness in class. Coffee emerged as the most common source of caffeine among students. This study highlights the role of caffeine in supporting student performance and offers a basis for future research to explore

caffeine consumption among students across different regions of Malaysia, where the topic remains underexplored.

Keywords:
Caffeine consumption, university students, academic performance, cognitive functions, Malaysia

1 Introduction

In Malaysia, the coffee industry has grown into one of the most dynamic segments of the food and beverage market. Beyond being a traditional beverage, coffee now represents an important lifestyle product, with rising demand from urban consumers, particularly young adults (Ong, 2021). Malaysia's café culture has been significantly shaped by both multinational chains such as Starbucks, The Coffee Bean & Tea Leaf, and McCafé, as well as local franchises like OldTown White Coffee. This growth highlights not only coffee's cultural significance but also its role as a major economic contributor in the food service sector.

Petaling district was chosen as the study site because it has the highest density of universities in Selangor, housing approximately 296,300 students, and is also home to more than 480 cafés and coffee shops. This makes Petaling an ideal context to investigate caffeine consumption habits among students, who form one of the most active consumer groups.

While global research has documented both positive and negative effects of caffeine on student performance (Khan et al., 2017; Jahrami et al., 2020; Samaha et al., 2020), studies in Malaysia remain scarce. In particular, there is limited evidence on the dual effects of caffeine, both benefits (focus, productivity, alertness) and drawbacks (sleep disturbance, anxiety, dependency) among university students in the local context. This creates a contextual gap in the literature. Additionally, most prior studies have either focused on consumption patterns (literature gap) or treated caffeine's effects unidimensionally, without assessing both positive and negative impacts simultaneously (variables gap). Finally, there is a methodological gap, as few studies have employed structured surveys with large samples across multiple universities in Malaysia to systematically analyse these relationships.

To address these gaps, the present study examines the effects of caffeine consumption on student performance in Petaling, Selangor, focusing on both positive and negative impacts and identifying which has the greater influence.

2 Literature Review

2.1 Effects of Students' Caffeine Consumption

Caffeine is widely ingested by university students in order to improve cognitive function during stressful circumstances such as courses, homework, examinations, projects, and extracurricular activities. Students of higher education reported feeling

more awake, clear-headed, and able to concentrate after taking moderate levels of caffeine (Stachyshyn et al., 2021: Smith, 2024). However, research found that caffeine usage is linked to depressive symptoms and greater levels of anxiety among university students (Bertasi et al., 2021). Jahrami et al. (2020) discovered that increased caffeine intake is connected to headaches, anxiety, and psychological discomfort. Furthermore, it was reported that 70% of students who drink caffeine had at least one withdrawal symptom such as headaches, drowsiness, or fatigue (Ramli et al., 2019; Kharaba et al., 2022). In addition, students who have experienced caffeine intoxication are more likely to have a high caffeine intake because the more caffeine they ingest, the more symptoms they experience (AlAteeq, Alotaibi, Saqer, Alharbi, Musllet & AlRaqibah, 2021). According to a study by Nguyen-Van-Tam & Smith (2023), some people have improved memory performance and executive function after consuming a caffeinated beverage. The majority of students indicated that caffeine helps them get up in the morning, remain focused, and stay alert after ingestion (Choi, 2020). Another study indicated that caffeine lowers weariness, which improves performance on activities such as driving, schoolwork, and sports (Caroline et al., 2019; Collier, 2024).

2.2 Positive Effects (Concentration)

Caffeine is a well-known stimulant that can be used to boost alertness and performance. Cooper et al., (2021) reviewed a large number of studies and concluded that caffeine increases both selective attention by focusing on the relevant stimulus and sustained attention, like maintaining focused attention over an extended period of time. According to Sharma et al., (2022), caffeine improves performance on both simple and complex attention tasks, concluding that caffeine has clear beneficial effects on attention and that these effects are even more widespread than previously assumed. The majority of students reported that caffeine helps them wake up in the morning, stay focused, and stay awake after consumption (Hermanoche, 2023). Another study from The Aga Khan University in Pakistan found that 52% of medical students used caffeine to stay focused in order to cope with academic and athletic stress, and workloads (Alqawasmi et al., 2024). Another study, conducted among undergraduate students from various medical and dental universities in India, discovered that caffeine increases an individual's sharpness and alertness level (Rajeswaran et al., 2020). As a result, many students sacrifice sleep for academic purposes and consume caffeinated stimulants to stay alert.

2.3 Positive Effects (Motivation Enhancement)

There are some physical and psychological benefits of caffeine consumption, especially in the motivation enhancement aspect. Caffeine has well-documented impacts on attention, motivation, and mood, with these effects occurring as fast as 10 minutes after consumption (Zhang et al., 2024). The impression of oral caffeine consumption is linked to psychological factors such as determination, motivation, mood states, and beliefs (Maqsood et al., 2020). Caffeinated cocoa beverages contain chemicals like choline and tryptophan that may affect mood, motivation, or cognitive performance (Fuller et al., 2021). Caffeine can also help some student athletes stay

motivated when they are doing sports or working out. Caffeine has been used to increase exercise performance for decades, and there is plenty of scientific evidence that shows it lowers fatigue and provides a 'lift' during aerobic activity, and that it can also be used before exercise to improve mood and perception, removing some of the mental barriers to exercise (Kennedy & Wightman, 2022).

2.4 Negative Effects (Addiction)

Caffeinated drinks can easily become addictive for certain people. This is due to the chemical changes in the brain that occur as a result of long-term usage. Caffeine tolerance develops the same way it does with other drugs or alcohol if consumed on a daily basis. Multiple studies stated that it has become a daily ritual for students to consume caffeinated drinks in order to start the day or get through the day (Agoston et al., 2017; Choi, 2020; Rajeswaran et al., 2020). Caffeine acts as a stimulant, which means it increases physiological activity and boosts enthusiasm. According to Agoston et al. (2019) and Ngjelina, (2024), the level of addiction for different caffeinated drinks are stated as follows: coffee is the most popular caffeinated beverage among participants, with 79% drinking it on a regular basis, followed by tea (17.1%), cola (6.8%), and energy drinks (3.9%). Due to the fact that the higher the academic class, the greater the strain, demand, and stress connected to academic requirements (Donald, 2017; Deng et al., 2022). A study by Samaha et al. (2020) indicates that students' concern during their academic year, where they experience stressful social events, low socioeconomic levels, and being obliged to study in a difficult major while maintaining a strong performance, has a significant influence on caffeine addiction.

2.5 Negative Effects (Withdrawal Symptoms)

Caffeine withdrawal symptoms can be clinically significant, and they can be quite common considering the widespread use of the substance. Samaha et al. (2020) stated that the most reported symptoms of caffeine withdrawal are fatigue, headaches, craving for caffeine, irritability, drowsiness, and depression and/or anxiety. In research by Booth, Saxton, and Rodda (2020), approximately 85% of respondents said that they had encountered at least one caffeine-related problem in the previous 12 months, and nearly half of the sample stated that they were concerned with dehydration, dependency, and insomnia. Furthermore, Nasir et al. (2018) and Kharaba et al. (2022) found that the most frequent side effect of caffeine use was insomnia, and most students noticed fatigue, followed by a craving for caffeine and headaches upon the time of withdrawal. Moreover, Maqsood et al. (2020) stated that caffeine withdrawal causes severe headaches, muscular discomfort, stiffness, vomiting, and nausea in heavy caffeine users. A study by Rajeswaran et al. (2020) revealed that caffeine withdrawal symptoms include increased tiredness, reduced mental alertness, and poor performance in basic reflexes, reaction time, and recognition memory skills in individuals who ingest caffeine daily. Increased caffeine consumption may develop into dependency as tolerance grows, which forces higher doses of intake in order for the consumer to get the same stimulatory effects.

2.6 Students' Performances

Caffeine has become an increasingly important part of students' lives, with an increased need for caffeinated beverages in between examinations, schoolwork, and socialising. In a study by Yasmeen et al. (2024), they found that caffeine consumption is associated with enhanced alertness and improved performance in students preparing for examinations, the ability to relieve headaches, and performing tasks for longer hours. In addition, among the college students surveyed by Mahoney et al. (2019); Boolani et al. (2020), numerous reported that caffeinated beverages improve their mood or performance, such as feeling more alert, improving focus, increasing physical energy, elevating mood, and reducing stress.

However, a study by Gabrish (2017); Amini and Akbar (2024) indicated that non-caffeinated students have considerably higher GPAs than caffeine-dependent students, which raises concerns about existing practices regarding caffeine consumption. Hardy et al. (2021) also stated that students who reported high amounts of caffeine usage did not have higher overall GPAs than those who did not take caffeine. According to the findings by Leal et al. (2022), drinking energy drinks may be a risk factor for poorer academic performance. Students in pre-med or pre-law programmes, as well as those enrolled in master's and doctorate programmes, show minimal indication that energy drinks are connected to academic performance. It shows that students who use large quantities of energy drinks on a regular basis may be at greater risk of experiencing difficulties in their academic studies.

2.7 Conceptual Framework

In light of the reviewed literature, the present study adopts and adapts prior conceptualisations of caffeine's effects to frame its investigation. Specifically, four key dimensions (concentration, motivation, addiction, and withdrawal) were identified as recurring constructs in earlier studies on caffeine consumption among students (e.g., Cooper et al., 2021; Sharma et al., 2022; Samaha et al., 2020; Kharaba et al., 2022). While past research has primarily examined these variables in relation to health, psychological outcomes, or general lifestyle habits, limited attention has been given to how they collectively influence academic performance. By contextualising these factors within the academic environment of university students, this study positions academic performance as the dependent variable and proposes a conceptual framework that integrates both positive and negative effects of caffeine consumption.

3 Methodology

3.1 Research Design

Quantitative and descriptive research were utilised in this study because it allows for diversity in the surveys by including university students from a range of backgrounds. Quantitative research is approached for this study since it includes a bigger sample size, which may better reflect university students and the population's variety. The researchers also used correlational research in investigating the relationships between

two variables without controlling or manipulating any of the variables (Bhandari, 2022).

3.2 Population, Sample Size, Unit of Analysis, and Sampling Technique

The population of this study comprises university students in Selangor, with a specific focus on students enrolled in 25 public and private universities located in the Petaling district. Selangor was chosen as the study area because it is the focal point of Peninsular Malaysia and hosts the largest higher education sector in the country (Selangor State Investment Centre, 2014). Petaling district, in particular, has the highest number of universities, with an estimated 296,300 students currently enrolled in both public and private institutions.

The sample size was determined with reference to Krejcie and Morgan's (1970) sample size table, which suggests that for a population of 296,300 students, a minimum of 384 respondents is required. To strengthen the validity of the study and to account for possible non-responses, the target sample size was set at 400 respondents.

A convenience sampling technique was employed for this study. Given the vast number of university students and practical limitations such as time and accessibility, convenience sampling was deemed appropriate to ensure the feasibility of data collection. This method allowed the researchers to reach students who were readily available and willing to participate, primarily through online platforms (e.g., Google Forms distributed via student social media groups) and through networks in selected universities in Petaling. Convenience sampling is particularly suitable for exploratory studies where the goal is to identify patterns, relationships, and potential implications rather than to generalise findings to the entire population (Etikan, Musa, & Alkassim, 2016).

Although convenience sampling has limitations in representativeness, steps were taken to mitigate bias by ensuring participation across different universities and including respondents from varied demographic backgrounds. This approach increased the diversity of the sample and provided meaningful insights into caffeine consumption and academic performance among students in Petaling.

3.3 Data Collection Method

The self-administered questionnaire was used in this study. Prior to the data collecting period, a possible location around Petaling, Selangor, with a high probability of caffeine- consuming students is determined. It was conducted on approximately 384 participants in various universities in the Petaling district of Selangor, Malaysia. The medium that was used for data collection through the self-administered questionnaire is the internet survey Google Form. These forms were distributed to the selected population through social media platforms.

3.4 Instrumentation

The study employed a structured questionnaire to collect data, comprising five sections and a total of 34 items related to caffeine consumption and academic

performance among university students. The questionnaire was adopted and adapted from previous validated studies to ensure content validity (Cooper et al., 2021; Sharma et al., 2022; Samaha et al., 2020; Kharaba et al., 2022). Minor adjustments were made to reflect the local context of university students in Petaling, Selangor, and to improve clarity for respondents from diverse socio-demographic backgrounds. The questionnaire was prepared in both Bahasa Malaysia and English to minimize potential misunderstanding.

Closed-ended questions were employed, with participants asked to indicate their level of agreement using a 5-point Likert scale (1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, 5 = strongly disagree). Likert scales are commonly used in surveys to measure attitudes, opinions, or perceptions (Bertram, 2007; Jamieson, 2017).

Additionally, Multiple Choice Questions (MCQs) were included in the demographic section. MCQs are a type of closed question in which participants select one or more responses from a predefined list, allowing for consistent data collection and analysis (Cohen et al., 2018).

Overall, the questionnaire design and content were guided by the adopted conceptual framework, which highlights four key dimensions of caffeine consumption: concentration, motivation, addiction, and withdrawal, and their relationship with academic performance. By adapting these previously validated constructs, the instrument ensures both relevance to the study objectives and reliability of the data collected.

A pilot study was conducted with 30 university students in Petaling to test the clarity, reliability, and validity of the questionnaire. Feedback from the pilot study led to minor adjustments in wording to ensure ease of comprehension. The pilot data were not included in the main analysis.

3.5 Plan for Data Analysis

The data were analysed using SPSS version 26.0. Both descriptive and inferential statistical techniques were applied. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarise respondents' demographic characteristics and study variables.

For inferential analysis, both correlation and Multiple Linear Regression (MLR) were employed. Correlation analysis was conducted to examine the strength and direction of the relationship between the independent variables (positive and negative impacts of caffeine consumption) and the dependent variable (student academic performance). Subsequently, MLR was applied to determine the extent to which the independent variables jointly explained variations in student performance.

The level of statistical significance was set at $p < 0.05$. Conclusions were drawn based on the results of the descriptive and inferential analyses to provide a comprehensive understanding of the effects of caffeine consumption on student performance.

4 Findings

4.1 Respondents' Profile

A total of 400 valid responses were collected from students across 25 public and private universities in Petaling, Selangor. The demographic analysis showed that respondents were fairly balanced in terms of gender, with a slight majority being female. Most respondents were between 19 and 24 years old, representing typical undergraduate cohorts. Both public and private university students were included to ensure variation in the sample.

4.2 Caffeine Consumption Patterns

The findings reveal that coffee was the most frequently consumed caffeinated beverage among students, followed by tea and energy drinks. Most students reported consuming caffeine during late-night study sessions, especially close to examinations and assignment deadlines. This suggests that caffeine consumption is strongly tied to academic demands and coping strategies for time pressure.

4.3 Descriptive Statistics of Study Variables

The constructs in this study were measured using five-point Likert scales. Table 1 presents the mean and standard deviation for each construct.

Table 1: Mean and Standard Deviation of Constructs

Construct	Mean (M)	Std. Deviation (SD)
Positive effects of caffeine	3.92	0.65
Negative effects of caffeine	2.78	0.74
Academic performance	3.85	0.60

The results indicate that students perceived caffeine as having stronger positive effects (M = 3.92) compared to negative effects (M = 2.78). Academic performance scored relatively high (M = 3.85), suggesting that students believe caffeine contributes to productivity and attentiveness in their studies.

4.4 Items-Level Mean Scores

Table 2 shows the mean scores for individual items measuring the effects of caffeine consumption.

Table 2: Mean Scores of Caffeine Effects Items

Items	Mean (M)	SD
Caffeine helps me stay awake when studying	4.10	0.58
Caffeine improves my focus during lectures	3.95	0.61
Caffeine helps me complete academic tasks more effectively	3.88	0.66
Caffeine causes me to feel restless or anxious	2.65	0.72
Caffeine disrupts my sleeping patterns	2.92	0.69

The highest-rated item was “Caffeine helps me stay awake when studying” (M = 4.10), while the lowest-rated negative item was “Caffeine causes me to feel restless or anxious” (M = 2.65). This shows that students associate caffeine more with academic benefits than with drawbacks.

4.5 Correlation Analysis

To test the relationship between caffeine consumption and academic performance, Pearson’s correlation analysis was conducted.

Table 3: Correlation Analysis

		MEANPEP	MEANNEP	MEANSP
MEANPEP	Pearson Correlation	1	.197**	.750**
	Sig. (2-tailed)		.000	.000
	N	400	400	400
MEANNEP	Pearson Correlation	.197**	1	.320**
	Sig. (2-tailed)	.000		.000
	N	400	400	400
MEANSP	Pearson Correlation	.750**	.320**	1
	Sig. (2-tailed)	.000	.000	
	N	400	400	400

**Note: *p < 0.05, *p < .01, MEANPEP: Positive Effect on Performance MEANNEP: Negative Effect on Performance, MEANSP: Student Performance*

Table 3 shows that the positive effects of caffeine consumption were highly correlated with students’ academic performance ($r = 0.75$, $p < .05$). This indicates a strong positive relationship, suggesting that greater perceived positive effects of caffeine are associated with better performance. In contrast, the correlation between the negative effects of caffeine consumption and student performance was weaker ($r = 0.32$, $p < .05$). Although the relationship was positive, it was only at a low level compared to the results.

4.6 Regression Analysis

A multiple regression analysis was performed to determine the extent to which positive and negative effects of caffeine predict academic performance.

Table 4: Multiple Regression between Effects of Students’ Caffeine Consumption and Students’ Performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.197	.147		1.339	.181
	MEANPEP	.786	.036	.715	21.926	.000
	MEANNEP	.189	.035	.179	5.487	.000

a. Dependent Variable: MEANSP

Table 4 indicates the multiple linear regression output between variables involved in the study. The positive effect on performance (β=.715, p=.000) had a positive influence on students' performance and this was supported by a previous study by Nguyen-Van-Tam and Smith (2023) stated that some people have improved memory performance and executive function after consuming a caffeinated beverage. Meanwhile, based on the results of the negative effects of caffeine consumption (β=.179, p=.000), it is a factor that also relates to the students' performance. This is supported by a previous study that 70% of students who consumed caffeine had at least one withdrawal symptom, such as headaches, drowsiness, or fatigue (Nowaczewska et al., 2019).

4.7 Summary

Overall, the findings indicate that caffeine consumption plays a significant role in shaping students' academic experiences. While both positive and negative effects are acknowledged, the results suggest that the perceived benefits of caffeine far outweigh its drawbacks in the context of academic performance. Students primarily consume caffeine to enhance focus, extend study hours, and complete tasks efficiently, though some side effects such as restlessness and sleep disruption were also reported.

5 Discussion

5.1 Effects of Caffeine Consumption on Students

The first research objective was to examine the effects of caffeine consumption on students. The study found that caffeine significantly influenced students' productivity, waking process, and sleep patterns, with productivity showing the strongest effect (M = 4.09). These findings are consistent with Vital-Lopez et al. (2024), who reported that caffeine enhances alertness and concentration. Other studies have highlighted additional effects of caffeine on mood, heart rate, and urination frequency (Groosman, 2024; Saxton & Rodda, 2020), although these variables were not included in this study. Taken together, the results suggest that caffeine consumption has both positive and negative impacts, supporting previous research that emphasizes its role in cognitive and physiological functioning among students (Khan et al., 2017; Stachyshyn et al., 2021).

5.2 Positive and Negative Effects on Performance

The second research objective was to investigate the relationship between caffeine consumption and academic performance. Findings revealed a strong positive relationship, with students primarily consuming caffeine to improve focus, motivation, alertness, and productivity, especially during study sessions. These results align with Khan et al. (2017) and Stachyshyn et al. (2021), who noted that caffeine helps students extend study hours and maintain alertness in class. Negative effects, such as sleep disturbance (M = 2.92), restlessness, and anxiety (M = 2.65), were less pronounced, indicating that most students consumed caffeine at moderate levels (50–100 mg daily), consistent with Maqsood et al. (2020). Excessive consumption, however, has been

linked to headaches, anxiety, and emotional issues (Jahrami et al., 2020; Samaha et al., 2020). This demonstrates that moderate caffeine intake may optimize academic performance without substantial adverse effects.

5.3 Most Influential Effects on Performance

The third research objective was to identify which effects of caffeine most strongly influence academic performance. Analysis showed that positive effects, particularly enhanced productivity, focus, and motivation, had higher mean scores (above 3.4) compared to negative effects. This supports the findings of Alqawasmi et al. (2024), who concluded that caffeine improves mood, energy, and engagement, enabling students to perform better academically. These results indicate that while caffeine may have minor negative consequences, its role in promoting alertness and academic efficiency is more substantial.

5.4 Limitations

This study faced several limitations. Student performance is influenced by other factors such as environment, learning skills, finances, and peer influence, not just caffeine. The inability to fully separate negative effects from positive outcomes also restricts interpretation, since both showed a positive relationship with performance. Moreover, caffeine habits may vary during periods of academic stress. The use of self-reported questionnaires may have introduced recall bias, and the researchers' limited experience in data collection may also have affected accuracy.

6 Conclusion

Overall, the findings showed that caffeine is a widely used stimulant among university students, with both positive and negative perceived effects. Students reported benefits such as improved concentration, productivity, and alertness, alongside drawbacks including sleep disruption, dependency, and withdrawal symptoms. Differences across studies may be due to varying contexts, periods, and methods, yet most agree that moderate consumption offers academic benefits, while excessive intake poses health risks.

Caffeine appears safe when consumed responsibly and within recommended limits, allowing students to enhance cognitive function and academic performance in a healthier way. This study contributes valuable insights for educators, health professionals, policymakers, and the food industry in understanding student caffeine habits. Future research should expand beyond Petaling to include students from other states and disciplines, such as engineering or accounting, to provide a more comprehensive understanding of caffeine consumption among Malaysia's tertiary population.

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8 References

Ágoston, C., Urbán, R., Király, O., Griffiths, M., Rogers, P. and Demetrovics, Z. (2017). Why Do You Drink Caffeine? The Development of the Motives for Caffeine Consumption Questionnaire (MCCQ) and Its Relationship with Gender, Age and the Types of Caffeinated Beverages. International Journal of Mental Health and Addiction, 16(4), pp.981-999. https://doi.org/10.1007/s11469-017-9822-3

Ágoston, C., Urbán, R., Rigó, A., Griffiths, M. D., & Demetrovics, Z. (2019). Morningness-eveningness and caffeine consumption: A largescale path-analysis study. Chronobiology International, 36(9), 1301–1309. https://doi.org/10.1080/07420528.2019.1624372

AlAteeq, D. A., Alotaibi, R., Al Saqer, R., Alharbi, N., Alotaibi, M., Musllet, R., & Alraqibah, R. (2021). Caffeine consumption, intoxication, and stress among female university students: A cross-sectional study. Middle East Current Psychiatry, 28(1). https://doi.org/10.1186/s43045-021-00109-5

Alqawasmi, A. A., Alsalhi, N. R. I., Omar, A. A., Fattah, H. A. A., Abuawad, B., & Zangana, M. A. (2024). Caffeine Consumption Patterns Among Medical Students: Implications for Health Education and Academic Performance. Journal of Natural Science, Biology and Medicine, 15(3), 562.

Amini, A., & Akbar, S. (2024). Pengaruh Konsumsi Kopi terhadap Konsentrasi Belajar pada Mahasiswa Fakultas Teknik. Ibnu Sina: Jurnal Kedokteran dan Kesehatan-Fakultas Kedokteran Universitas Islam Sumatera Utara, 23(2), 202-214.

Astro Awani. (2021). Alertness, concentration, sleep: What effect does coffee have on your daily routine? astroawani.com. https://www.astroawani.com/gaya-hidup/alertness-concentration-sleep-what-effect-does-coffee-have-your-daily-routine-281511

Bahrain. Foods. 2020; 9(4):473. https://doi.org/10.3390/foods9040473

Bertasi, R. A., Humeda, Y., Bertasi, T. G., Zins, Z., Kimsey, J., & Pujalte, G. (2021). Caffeine intake and mental health in college students. Cureus. https://doi.org/10.7759/cureus.14313

Bertram, D. (2007) Likert Scales: CPSC 681—Topic Report. Poincare, 1-11. http://poincare.matf.bg.ac.rs/~kristina/topic-dane-likert.pdf

Bhandari, P. (2022). Correlational research: When & how to use. Scribbr. Retrieved August 5, 2022, from https://www.scribbr.com/methodology/correlational-research/#:~:text=What%20is%20correlational%20research%3F,experimental%20type%20of%20quantitative%20research

Boolani, A., Fuller, D. T., Mondal, S., Wilkinson, T., Darie, C. C., & Gumpricht, E. (2020). Caffeine-containing, adaptogenic-rich drink modulates the effects of caffeine on mental performance and cognitive parameters: a double-blinded, placebo-controlled, randomized trial. Nutrients, 12(7), 1922.

Booth, N., Saxton, J., & Rodda, S. N. (2020). Estimates of caffeine use disorder, caffeine withdrawal, harm and help-seeking in New Zealand: A cross-sectional survey. Addictive Behaviors, 109, 106470. https://doi.org/10.1016/j.addbeh.2020.106470

Champlin, S.E., Pasch, K.E., Perry, C.L. (2016). Is the Consumption of Energy Drinks Associated With Academic Achievement Among College Students?. The Journal of Primary Prevention, 37(4), 345–359. doi:10.1007/s10935-016-0437-4

Choi, J. (2020). Motivations Influencing Caffeine Consumption Behaviors among College Students in Korea: Associations with Sleep Quality. Nutrients, 12(4), 953. https://doi.org/10.3390/nu12040953

Choi, J. (2020). Motivations influencing caffeine consumption behaviors among college students in Korea: Associations with sleep quality. Nutrients, 12(4), 953.

Collier, G. (2024). Relationships Between Caffeine Intake, Frequency of Exercise, and Fatigue, in University Students (Master's thesis, Southeast Missouri State University).

Cooper Jr, R. K., Lawson, S. C., Tonkin, S. S., Ziegler, A. M., Temple, J. L., & Hawk Jr, L. W. (2021). Caffeine enhances sustained attention among adolescents. Experimental and clinical psychopharmacology, 29(1), 82.

Deng, Y., Cherian, J., Khan, N. U. N., Kumari, K., Sial, M. S., Comite, U., ... & Popp, J. (2022). Family and academic stress and their impact on students' depression level and academic performance. Frontiers in psychiatry, 13, 869337.

Devi L. S, S., S. C, A., & S, B. (2018). The Rationale of Caffeine Consumption and Its Symptoms During Preparatory and Non-preparatory Days: A Study among Medical Students. Biomedical and Pharmacology Journal, 11(2), 1153–1159. https://doi.org/10.13005/bpj/1476

Ferreira, J., Ferreira, C., & Bos, E. (2021). Spaces of consumption, connection, and community: Exploring the role of the coffee shop in urban lives. Geoforum, 119, 21–29. https://doi.org/10.1016/j.geoforum.2020.12.024

Fuller, D. T., Smith, M. L., & Boolani, A. (2021). Trait energy and fatigue modify the effects of caffeine on mood, cognitive and fine-motor task performance: A post-hoc study. Nutrients, 13(2), 412.

Gabrish, D. L. (2017). Caffeine Use, Hours of Sleep, and Academic Performance of Undergraduate College Students. ORCID.

Ghozayel, M., Ghaddar, A., Farhat, G., Nasreddine, L., Kara, J., & Jomaa, L. (2020). Energy drinks consumption and perceptions among University Students in Beirut, Lebanon: A mixed methods approach. PLoS one, 15(4), e0232199.

Grossman, C. (2024). *An observation of the relationship between caffeine consumption and motivation* (Doctoral dissertation, Institute of Art, Design+ Technology).

Hardy, R., Kliemann, N., Dahlberg, P., Bode, A., Monroe, E., & Brand, J. (2021). The relationship between energy drink consumption, caffeine content, and nutritional knowledge among college students. The Journal of Primary Prevention, 42(3), 297-308.

Hermanoche, M. A. J. (2023). The relationship between caffeine consumption and sleep quality in New Zealand young adults: a thesis presented in partial fulfilment of the requirements for the degree of Master of Science in Nutrition and Dietetics at Massey University, Albany, New Zealand (Doctoral dissertation, Massey University).

Jamieson, S. (2017, September 27). Likert scale. Encyclopedia Britannica. https://www.britannica.com/topic/Likert-Scale

Kennedy, D. O., & Wightman, E. L. (2022). Mental performance and sport: Caffeine and co-consumed bioactive ingredients. Sports Medicine, 52(Suppl 1), 69-90.

Kharaba, Z., Sammani, N., Ashour, S., Ghemrawi, R., Al Meslamani, A. Z., Al-Azayzih, A., ... & Alfoteih, Y. (2022). Caffeine consumption among various university students in the UAE, exploring the frequencies, different sources and reporting adverse effects and withdrawal symptoms. Journal of nutrition and metabolism, 2022(1), 5762299.

Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. Educational and Psychological Measurement, 30(3), 607–610. https://doi.org/10.1177/001316447003000308

Kumar, A., Loo, W. P., Lim, K., A. D. (2016). A case study on Starbucks influencing. University Sains Malaysia.

Leal, W. E., Jackson, D. B., & Boccio, C. M. (2022). Adolescent energy drink consumption and academic risk: results from the monitoring the future study, 2010–2016. Health Education & Behavior, 49(2), 281-290.

Mahoney, C. R., Giles, G. E., Marriott, B. P., Judelson, D. A., Glickman, E. L., Geiselman, P. J., & Lieberman, H. R. (2019). Intake of caffeine from all sources and reasons for use by college students. Clinical Nutrition, 38(2), 668–675. https://doi.org/10.1016/j.clnu.2018.04.004

Manchester, J., Eshel, I., & Marion, D. W. (2017). The benefits and risks of energy drinks in young adults and military service members. Military Medicine, 182(7). https://doi.org/10.7205/milmed-d-16-00339

Maqsood, U., Zahra, R., Latif, M. Z., Athar, H., Shaikh, G. M., & Hassan, S. B. (2020). Caffeine Consumption & perception of its effects amongst university students. Proceedings of Shaikh Zayed MedicalComplex Lahore, 34(4), 46–51. https://doi.org/10.47489/p000s344z770mc

Md Isa, Z., Anuar, A. A., Danial Azmi, A., Sanjeevaraj Tamil Selvan, Hisham, N. S., & Yong Zi Qing. (2021). Does Caffeine Intake Influence Mental Health of Medical Students? Malaysian Journal of Public Health Medicine, 21(2), 22–28. https://doi.org/10.37268/mjphm/vol.21/no.2/art.626

Mohd Ishak, N., & Abu Bakar, A. Y. (2014). Developing sampling frame for case study: Challenges and conditions. World Journal of Education, 4(3). https://doi.org/10.5430/wje.v4n3p29 Jahrami H, Al-Mutarid M, Penson PE, Al-Islam Faris M, Saif Z, Hammad L. Intake of Caffeine and Its Association with Physical and Mental Health Status among University Students in

Nasir, S.A. & Nasir, G.A. & Usman, A. & Razi-Ur-Rehman, & Muzaffar, N. & Aftab, Sommayya & Ali, M. (2018). Prevalence and pattern of caffeine consumption among university students - A cross-sectional study. Pakistan Journal of Medical and Health Sciences. 12. 983-986.

Nowaczewska, M., Wiciński, M., & Kaźmierczak, W. (2020). The ambiguous role of caffeine in migraine headache: from trigger to treatment. *Nutrients*, *12*(8), 2259.

Ngjelina, E. (2024). Correlates of Coffee and Energy Drink Use Among Individuals with Severe Alcohol Use Disorder.

Nguyen-Van-Tam, D. P., & Smith, A. (2023). Effects of regular caffeine consumption on semantic memory and executive function: A secondary analysis. World Journal of Pharmaceutical and Medical Research, 12(4), 1852-1873.

Norshafarina, S.K., Ahmad Aisar A.H.., Neni W.S. (2019) Association between the consumption of caffeinated energy drink, daytime sleepiness and psychological distress level among universities students in Shah Alam, Selangor. Vol. 16 No. 2 Dec, 2018, Management and Science University. http://mymedr.afpm.org.my/publications/86187

Rajeswaran, S., Zulkifli, M. Z., Budi Irawan, N. A., Mohd Seh, N., & Yin, L. S. (2020, February 14). A Cross Sectional Study on Caffeine Consumption and Caffeine Expectancy Among Undergraduate Medical Students. American Institute of Science. Retrieved from http://www.aiscience.org/journal/ajfsh

Ramli, N.A., Sriperumbuduru, V.P., Ghazi, H.F., Dalayi, N.J., (2019). A Study of Caffeine Consumption Patterns and Dependence among Management and Science University Students. Indian Journal of Forensic Medicine & Toxicology. 13. 101. Doi: 10.5958/0973-9130.2019.00021.5.

Samaha, A., Al Tassi, A., Yahfoufi, N., Gebbawi, M., Rached, M., & Fawaz, M. A. (2020). Data on the relationship between caffeine addiction and stress among Lebanese medical students in Lebanon. Data in Brief, 28, 104845. https://doi.org/10.1016/j.dib.2019.104845

Sedgwick, P. (2014). Cluster sampling. BMJ, 348, g1215. https://doi.org/10.1136/bmj.g1215

Sekaran, U. (2003) Research Methods for Business: A Skill-Building Approach. 4th Edition, John Wiley & Sons, New York.

Sekaran, U. (2010) Research Methods for Business: A Skill-Building Approach. 4th Edition, John Wiley & Sons, UK.

Sharma, K., Fallon, S. J., Davis, T., Ankrett, S., Munro, G., Christopher, G., & Coulthard, E. (2022). Caffeine and attentional control: improved and impaired performance in healthy older adults and Parkinson's disease according to task demands. Psychopharmacology, 239(2), 605-619.

Simpson, E., Stephenson, T., Brewer, D., Schwartz, A., & Bastin, S. (2016). Perceived stress, caffeine consumption, and GPA of undergraduate students at a large public university. Journal of Nutrition Education and Behavior, 48(7). https://doi.org/10.1016/j.jneb.2016.04.269

Smith, A. P. (2024). Personality, lunch, mood and selectivity in attention and memory. World Journal of Pharmacy and Pharmaceutical Studies, 13(2), 2280-2292.

Stachyshyn, S., Wham, C., Ali, A., Knightbridge-Eager, T., & Rutherfurd-Markwick, K. (2021). Motivations for caffeine consumption in New Zealand tertiary students. Nutrients, 13(12), 4236. https://doi.org/10.3390/nu13124236

Stachyshyn, S., Wham, C., Ali, A., Knightbridge-Eager, T., & Rutherfurd-Markwick, K. (2021). Motivations for caffeine consumption in New Zealand tertiary students. Nutrients, 13(12), 4236.

Vital-Lopez, F. G., Doty, T. J., & Reifman, J. (2024). When to sleep and consume caffeine to boost alertness. *Sleep*, *47*(10), zsae133.

Yasmeen, K., Abbas, M. M., Imran, H., Nadeem, S., Bibi, A., Anwar, Z., & Noreen, H. R. (2024). Examining the complex interactions of sleep deprivation, caffeine intake, stress, and resilience on cognitive performance and academic success among college students during high-stakes exams. Social Science Review Archives, 2(2), 244-258.

Zhang, Y., Yang, W., Xue, Y., Hou, D., Chen, S., Xu, Z., ... & Liu, C. (2024). Timing Matters: Time of Day Impacts the Ergogenic Effects of Caffeine—A Narrative Review. Nutrients, 16(10), 1421.