



The Impact of Caffeine Consumption on Productivity: A Case Study of Students at Rangsit University

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Abstract

Caffeine is the most widely consumed psychoactive substance in the world and is frequently used to enhance alertness, focus, and cognitive performance. Among university students, caffeine consumption has become an integral part of daily life, often used to manage academic pressure, mental fatigue, and demanding study schedules. This study aimed to examine the relationship between caffeine consumption and productivity, focusing on how varying levels of intake affect focus, alertness, and task efficiency. A quantitative research design was employed using an online questionnaire distributed to 400 students from Rangsit University. The survey collected data on caffeine consumption patterns, beverage types, frequency, and self-reported productivity levels using a five-point Likert scale. The findings revealed that moderate caffeine consumption was positively associated with improved concentration, motivation, and perceived productivity. However, excessive intake was linked to negative outcomes such as anxiety, restlessness, and disrupted sleep, which can hinder long-term performance. The results also showed that individual differences in caffeine sensitivity and habitual use significantly influence its effects. Overall, the study concludes that caffeine can be an effective short-term enhancer of productivity when consumed responsibly, but dependence or overuse may reduce its benefits. These findings emphasize the importance of balance and self-awareness in caffeine consumption, encouraging students to adopt healthier habits that sustain both academic performance and personal well-being.

Keywords: *Caffeine Consumption, Productivity, University Students, Alertness, Behavioral Study, Thailand*

1. Introduction

Caffeine intake has transcended cultural, societal, and economic barriers to become an essential part of everyday life for people worldwide. Caffeine, the most used psychoactive drug in the world, is frequently used to increase alertness, maintain wakefulness, and sharpen mental focus. Millions of individuals regularly incorporate it into their daily routines, and its presence is most noticeable in popularly used items like coffee, tea, energy drinks, and other soft beverages. Caffeine use is particularly common in academic and professional settings in today's culture, where people must contend with rising cognitive demands, lengthy workdays, and high-performance standards. As a result, caffeine is now seen as both a functional help for increasing productivity and a component of beverages. In both educational and professional settings, productivity is a critical factor in determining success and efficiency. It is intimately related to general wellbeing, task completion, cognitive performance, and decision-making quality. Understanding the elements that affect productivity has grown more crucial as businesses and educational institutions continue to place a strong emphasis on production and efficiency. Because of its stimulating qualities and broad availability, caffeine has attracted a lot of attention from researchers who want to know if consuming it increases productivity or just gives the appearance of better performance. This increasing interest emphasizes how crucial it is to investigate the effects of caffeine in a methodical and evidence-based way.

Caffeine's primary biological role is to stimulate the central nervous system. Blocking adenosine receptors in the brain is its main mode of action. The neurotransmitter adenosine, which promotes relaxation and drowsiness, causes people to feel increasingly exhausted as it builds up in the brain. Caffeine lowers fatigue and increases alertness and cognitive arousal by blocking adenosine activity (Nehlig, 2018). The frequently mentioned short-term advantages of coffee, such as better focus, quicker reaction times, more

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motivation, and increased task engagement, have a scientific basis thanks to this physiological process. Because of this, caffeine is frequently taken during times when prolonged focus is needed, as when preparing for tests, fulfilling deadlines at work, or doing mentally taxing chores.

The effects of caffeine consumption on productivity are not always consistent, despite its widespread use and alleged advantages. Excessive caffeine consumption can have detrimental effects, even while moderate consumption has been linked to gains in attention, vigilance, and other elements of cognitive ability. Increased anxiety, irritability, restlessness, gastrointestinal distress, and sleep disruptions have all been connected to high amounts of caffeine consumption; these conditions can all hinder cognitive functioning and lower overall efficiency (Smith, 2021). Because insufficient or poor-quality sleep can seriously impair productivity in the days that follow, sleep disturbance is especially troubling. This leads to a paradoxical cycle where people overindulge in coffee to combat weariness brought on by prior overindulgence, which may eventually exacerbate adverse effects. When long-term use is considered, the relationship between caffeine use and productivity becomes much more complicated. Caffeine may improve performance temporarily, but its long-term effects on productivity are still unknown. Moderate caffeine consumption has been linked in several studies to better decision-making, increased mental endurance, and improved task accuracy, especially in repetitive or lengthy tasks (Einöther & Giesbrecht, 2013). These results imply that, when taken in moderation, caffeine may be a helpful tool for enhancing cognitive function. Other experts, on the other hand, have expressed concerns with habitual caffeine usage, contending that frequent use may result in tolerance and eventually diminish its effectiveness. People may need bigger dosages to get the same stimulating effects as tolerance grows, which raises the possibility of negative consequences. Furthermore, excessive, and habitual caffeine usage has been linked to withdrawal symptoms and reliance, such as headaches, exhaustion, irritability, and trouble focusing when caffeine intake is cut back or stopped (Meredith et al., 2013). These symptoms can have a detrimental impact on overall productivity, emotional control, and work quality. These conflicting results underline the need for more research to ascertain whether caffeine's productivity-boosting benefits are long-lasting or mainly transient, as well as the discrepancy in the body of current literature.

The difference between actual performance outcomes and perceived productivity is another crucial factor. Many people claim to feel more productive after drinking coffee, although quantitative metrics like task accuracy, efficiency, or output quality do not necessarily match subjective assessments of enhanced performance. This disparity calls into question whether coffee improves productivity or if it only makes people more alert without increasing the effectiveness of their work. The association between caffeine and productivity may also be complicated by individual characteristics, such as caffeine sensitivity, habitual consumption patterns, stress levels, and sleep quality.

This study looks at both cognitive and behavioral elements of performance in academic and professional settings to determine how coffee use affects productivity. This study attempts to provide light on the situations in which caffeine improves productivity and those in which it may impair performance by combining previous empirical studies. It is anticipated that the results would offer insightful information to professionals, companies, and students who want to maximize performance while preserving health and wellbeing. Additionally, a better knowledge of caffeine's effects can help promote evidence-based lifestyle choices, workplace regulations, and healthier consumption patterns. In the end, this study advances our understanding of how one of the most widely used stimulants in the world affects wellbeing and productivity. Despite extensive research on caffeine and cognitive performance, several gaps remain in the literature. Many previous studies focus primarily on short-term laboratory experiments that measure reaction time or alertness under controlled conditions. However, fewer studies examine how caffeine consumption influences perceived productivity in real academic environments such as universities. Furthermore, the relationship between caffeine consumption and productivity can be explained through the arousal theory, which suggests that moderate physiological stimulation can enhance attention and task performance, while excessive stimulation may reduce performance due to stress or anxiety. Understanding how caffeine consumption affects students in real academic contexts is therefore important. This study aims to address this gap by examining caffeine



consumption patterns and their relationship with perceived productivity among students at Rangsit University.

Accordingly, this study aims to investigate the impact of caffeine consumption on productivity by exploring both cognitive and behavioral aspects of performance, with particular attention to perceived productivity, tolerance effects, and potential negative outcomes.

2. Literature Review

2.1 Caffeine and Cognitive Performance

One of the most popular psychoactive chemicals in the world, caffeine is essential to daily living in many different cultures and societies. Coffee beans, tea leaves, cacao pods, and several other plant sources naturally contain caffeine. It is most frequently ingested through liquids including coffee, tea, energy drinks, and soft drinks. Additionally, certain pharmaceuticals and dietary supplements include it. Caffeine's stimulant qualities, especially its capacity to lessen weariness, boost alertness, and improve perceived mental performance, are a major factor in its widespread appeal. Caffeine has become a popular tool for sustaining productivity and cognitive functioning in modern academic and professional settings, where people are often required to manage heavy workloads, tight deadlines, and extended periods of focus.

Recent studies continue to highlight the cognitive effects of caffeine on attention and alertness. For example, Temple et al. (2021) reported that moderate caffeine intake can improve sustained attention and reaction time among young adults. Similarly, Cappelletti et al. (2022) found that caffeine may enhance short-term cognitive performance when consumed in moderate doses, although excessive consumption can lead to negative physiological effects such as anxiety and sleep disruption.

Caffeine interacts with the central nervous system to produce its main effects from a biological and neurological perspective. Caffeine specifically acts as an antagonist of the brain's adenosine receptors. One neurotransmitter that contributes to sensations of drowsiness and mental exhaustion is adenosine, which progressively builds up throughout awake hours. Caffeine increases wakefulness and lessens fatigue by inhibiting adenosine receptors (Nehlig, 2018). Higher levels of alertness and higher neural activity are the results of this method. Caffeine not only inhibits adenosine but also increases the release of neurotransmitters including dopamine and norepinephrine, which are linked to better mood, motivation, focus, and cognitive control (Rogers et al., 2013). These neurochemical effects help explain why caffeine is frequently associated with improved focus, faster reaction times, and enhanced mental energy.

Numerous empirical studies have examined the immediate cognitive advantages of caffeine intake. Moderate caffeine consumption has been shown in numerous studies to enhance alertness, focus, and attention, especially when fatigued or sleep deprived. Caffeine doses between 40 and 300 mg have been shown to improve reaction time, sustained attention, and general attentiveness (Einöther & Giesbrecht, 2013). Caffeine is especially important in academic and professional settings where prolonged cognitive exertion is necessary since these effects are more noticeable in people who are mentally exhausted.

Caffeine has been demonstrated to affect motivation and task engagement in addition to improving attention and reaction time. According to Smith (2021), consuming caffeine can improve one's subjective sense of motivation and focus, especially when performing monotonous or repeated jobs. By raising physiological arousal, caffeine may help offset the consequences of these tasks, which frequently result in decreased attentiveness and worse performance over time. Caffeine is so frequently seen as a useful tool for boosting short-term productivity and sustaining focus throughout regular academic or professional pursuits.

Caffeine use is extremely common in professional settings, particularly in jobs with demanding schedules, long workdays, or high cognitive demands. According to McLellan et al. (2016), in mentally taxing occupations, moderate coffee use can enhance reaction time, decision-making speed, endurance, and vigilance. Caffeine is frequently utilized to sustain performance throughout long hours or periods of sleep deprivation in industries like emergency services, transportation, and healthcare. Caffeine may help people stay attentive and responsive in these situations, which may have short-term advantages.

Caffeine consumption patterns and related effects are similar in academic settings. Caffeine is often used by university students as a coping mechanism for academic stress, late-night study sessions, and test



preparation. According to research, moderate caffeine consumption can improve learning effectiveness, short-term memory, and information processing speed, all of which may help students do better academically during periods of intense study (Einöther & Giesbrecht, 2013). By assisting students in staying focused and attentive during lectures, study sessions, or tests, these effects may offer short-term benefits.

2.2 Perceived vs Actual Productivity

The fact that caffeine does not always enhance performance on all kinds of cognitive activities is another significant drawback noted in the literature. Caffeine can improve basic cognitive capabilities like attention and reaction time, but its effects on more complex cognitive functions are less reliable. Increasing arousal may not be beneficial for tasks requiring creativity, in-depth analytical thinking, or complicated problem-solving. Excessive stimulation can sometimes cause anxiety or cognitive rigidity, which can hinder performance. According to Smith (2021), excessive caffeine use is linked to anxiety, restlessness, and decreased task accuracy, all of which can eventually reduce rather than increase productivity. These results imply that the effects of caffeine follow a dose-dependent pattern, with moderate consumption being advantageous but excessive consumption potentially harmful.

Another significant topic covered in the literature is psychological reliance on coffee. Frequent caffeine use can develop into a habit, with people depending on it to improve performance as well as prevent withdrawal symptoms such as headaches, irritability, and diminished focus (Meredith et al., 2013). In these situations, caffeine may serve to return to baseline functioning rather than as a meaningful performance enhancer. The longevity of productivity increases linked to coffee and if frequent usage conceals underlying weariness or bad sleep habits are significant considerations raised by this.

The data currently in publication suggests that, especially when taken in moderation, caffeine may provide short-term advantages for alertness, attention, and cognitive function. However, personality characteristics, task demands, and consumption patterns all have an impact on these advantages. Overuse or frequent caffeine consumption can cause anxiety, sleep disturbances, tolerance, and decreased long-term productivity. The conflicting results in academic and professional environments emphasize the need for more studies that look at caffeine's longer-term and wider effects on productivity in practical situations. This study attempts to fill up these gaps and provide a more thorough knowledge of caffeine's significance in contemporary academic and professional life.

2.3 Negative Effects and Tolerance

Despite these advantages, the research also highlights how individual differences greatly influence the effects of caffeine. The way people react to caffeine is influenced by a number of factors, including body mass, genetic diversity, habitual consumption, and sensitivity to stimulants. According to Meredith et al. (2013), habitual caffeine users frequently develop tolerance, which means that the stimulating benefits of caffeine gradually wane. People may increase their consumption as tolerance grows in order to maintain the same level of alertness, which might increase the risk of adverse effects and lessen the overall efficacy of caffeine as a productivity enhancer.

The research also emphasizes the serious dangers of excessive and prolonged caffeine usage in work environments. The effect of coffee on sleep quality is one of the most frequently discussed topics. Excessive caffeine consumption might shorten sleep duration and delay the beginning of sleep, especially if it is taken later in the day (Rogers et al., 2013). In the end, poor sleep quality can undermine productivity by causing daytime weariness, decreased cognitive efficiency, and diminished attention. As a result, people get dependent on caffeine to make up for their lack of sleep, which further throws off sleep cycles. This loop may eventually lead to burnout, chronic weariness, and a decline in general performance.

Caffeine consumption patterns and related effects are similar in academic settings. Caffeine is often used by university students as a coping mechanism for academic stress, late-night study sessions, and test preparation. According to research, moderate caffeine consumption can improve learning effectiveness, short-term memory, and information processing speed, all of which may help students do better academically during periods of intense study (Einöther & Giesbrecht, 2013). By assisting students in staying focused and attentive during lectures, study sessions, or tests, these effects may offer short-term benefits.



However, high caffeine intake among students has been associated with a number of detrimental effects. High caffeine consumption has been linked to increased tension, anxiety, and sleep problems, according to Meredith et al. (2013). Since getting enough sleep is crucial for memory consolidation and long-term learning, sleep disturbance is especially detrimental in academic contexts. The short-term advantages of being more alert may be outweighed by the cognitive deficits that arise when coffee disrupts sleep. Consequently, excessive caffeine usage can have detrimental effects on long-term academic performance and mental health, even though it may increase immediate academic output.

There are still a number of important gaps in the body of research on caffeine and cognitive function. First, a lot of research focuses on short-term results like reaction time or attention span that are tested in controlled laboratory environments. Research on long-term productivity, behavioral patterns, and actual performance outcomes in academic and professional settings is rather few. Second, the generalizability of results is limited because individual variances, such as genetic variations in coffee metabolism and anxiety susceptibility, are frequently understudied.

Additionally, comparative studies examining the effects of coffee on various sorts of employment, including creative jobs, analytical problem-solving, and physical labor, are lacking. Other significant aspects of productivity are understudied because the majority of current research focuses on tasks demanding prolonged attention. These restrictions imply that rather than being generally advantageous, caffeine's effects on productivity are complicated and context-dependent.

3. Materials and Methods

This study used a quantitative research design with a qualitative component to explore how caffeine consumption affects productivity among university students. The quantitative approach allowed for objective measurement and statistical analysis of the link between caffeine intake and self-reported productivity outcomes. An open-ended question added context by capturing participants' individual experiences. A cross-sectional survey design was chosen, which is often used in social and behavioral research to examine lifestyle factors and performance outcomes at a specific point in time (Creswell, 2014). The target population included undergraduate and graduate students at Rangsit University. University students were a suitable group due to their frequent caffeine use and the academic pressures that often encourage its use for alertness, concentration, and performance. A total of 400 valid responses were gathered through convenience sampling. While convenience sampling can limit how widely findings apply, it is practical and effective for exploring behavioral patterns in a specific population (Etikan et al., 2016). To ensure diversity in the sample, responses were collected from students in various faculties, academic years, and study programs. Data were gathered using a structured online questionnaire created with Google Forms. The questionnaire was designed based on established survey principles to ensure clarity, consistency, and suitability for quantitative analysis (Saunders et al., 2019). It included several sections covering demographic characteristics, caffeine consumption habits, productivity measures, and an open-ended question. We included demographic variables such as age, gender, academic year, and faculty to describe the sample and account for potential differences in caffeine use and productivity among different student groups.

Caffeine consumption was treated as the independent variable, represented by various indicators. These included the types of caffeinated drinks consumed (coffee, tea, energy drinks, and soda), how often they were consumed, the quantity consumed daily, and when they were taken. These indicators reflect common dimensions in previous research on caffeine-related behaviors and consumption. Productivity was considered the dependent variable and measured using self-reported items related to focus, alertness, sustained concentration, perceived energy levels, task efficiency, and overall study or work performance. Most items used a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5), providing standardized numerical data suitable for statistical analysis. The Likert scale is widely accepted in social science research for assessing attitudes and perceptions because of its reliability and ease of interpretation (Likert, 1932). In addition to closed-ended questions, the questionnaire had one open-ended item that asked participants to explain, in their own words, how caffeine affects their study or work performance. This qualitative item aimed to capture individual perceptions and experiences not fully represented through numerical measures. Previous



research shows that while caffeine is often linked to improved alertness and concentration, individual responses can differ based on consumption patterns and tolerance levels (Smith, 2002). Adding qualitative responses enriched the study's interpretive depth.

Data collection lasted about four weeks. The survey link was shared using both online and in-person methods to reach a broad range of students. Online sharing occurred through social media platforms popular among university students, including Facebook groups for Rangsit University, Instagram stories, LINE groups, and messaging apps. These platforms enabled quick and cost-effective distribution of the questionnaire. Participants were also encouraged to share the survey link with friends, helping to increase the response rate. Face-to-face recruitment occurred across the campus, in academic buildings, libraries, cafeterias, and common areas. During these interactions, members of the research team explained the study's purpose and provided students with a QR code or direct survey link to complete the questionnaire on their mobile devices. This mixed method improved participation and representation across faculties and academic years (Dillman et al., 2014). All responses were automatically recorded and stored in Google Sheets. Before analysis, the dataset was carefully reviewed and cleaned to remove incomplete, duplicate, or inconsistent entries. Only fully completed questionnaires were included for analysis, resulting in a final sample size of 400 valid responses. The cleaned dataset was then exported for statistical analysis. Quantitative data were analyzed using descriptive and inferential statistical methods. Descriptive statistics, including frequencies, percentages, means, and standard deviations, summarized demographic characteristics, caffeine consumption patterns, and self-reported productivity levels. These statistics provided an overview of students' caffeine behaviors and perceived performance outcomes. To assess the relationship between caffeine consumption and productivity, correlation analysis was conducted. This analysis is commonly used in behavioral research to evaluate the strength and direction of relationships between continuous variables (Field, 2018). The goal was to determine if higher levels or more frequent caffeine consumption were linked to increased productivity indicators like focus and alertness. Qualitative responses from the open-ended question were analyzed using thematic analysis. Responses were reviewed and coded to identify common themes related to caffeine's perceived effects. Frequent themes included better focus and alertness, temporary boosts in energy and productivity, negative side effects like anxiety, jitters, heart palpitations, and sleep issues, reports of little to no perceived impact on performance, and the importance of moderation in caffeine use. These themes align with existing literature suggesting that moderate caffeine intake may boost cognitive performance, while excessive use can lead to negative physiological and psychological effects (Smith, 2002). Ethical considerations were strictly followed throughout the research process. Participation was voluntary, and respondents were informed about the study's purpose before completing the questionnaire. Anonymity and secrecy were guaranteed since no personally identifiable information was gathered. There were no consequences if participants left the study at any point. All data were used only for academic research and handled according to established ethical guidelines for social science research (American Psychological Association, 2020)

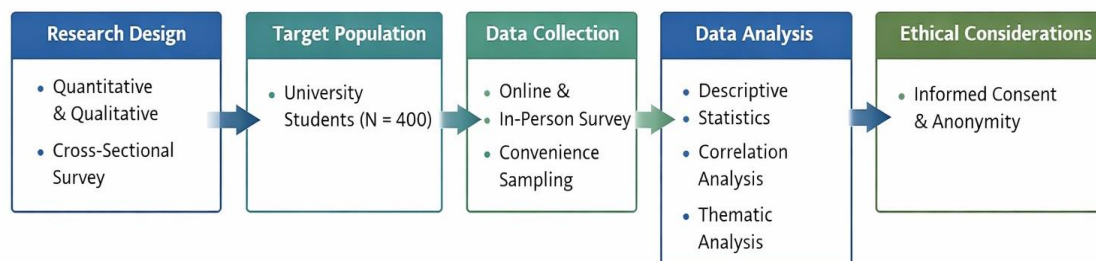


Figure 1 Overview of the research methodology applied in the study



Figure 1 illustrates the overall research methodology used in this study. A quantitative research design with a qualitative component was adopted to examine the relationship between caffeine consumption and productivity among university students. Data were collected through a cross-sectional survey administered to undergraduate and graduate students at Rangsit University using convenience sampling. Responses were gathered via an online questionnaire distributed through social media platforms and face-to-face recruitment on campus. Quantitative data were analyzed using descriptive statistics and correlation analysis, while qualitative responses from the open-ended question were examined through thematic analysis. Ethical considerations, including voluntary participation and anonymity, were maintained throughout the research process.

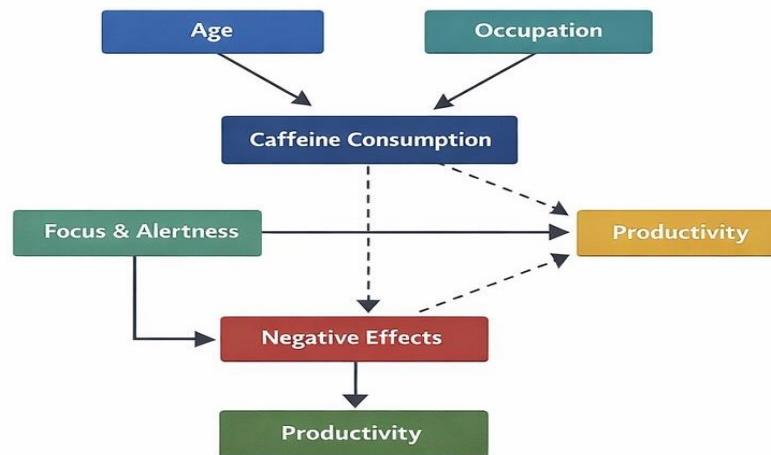


Figure 2 Conceptual framework of the study

Figure 2 presents the conceptual framework guiding this study. Caffeine consumption is treated as the independent variable and productivity as the dependent variable. The framework proposes that caffeine intake may influence productivity through improvements in focus, alertness, and perceived energy levels, which can enhance task efficiency and performance. At the same time, excessive caffeine consumption may produce negative effects such as sleep disturbance, anxiety, or energy crashes, which could reduce productivity. This framework reflects both the positive and negative pathways through which caffeine consumption may affect academic and work performance among university students.

4. Results and Discussion

4.1 Results

This section presents the results of the survey conducted among students at Rangsit University to examine caffeine consumption patterns and their perceived impact on productivity. A total of 400 valid responses were collected and analyzed. The results are presented using descriptive statistics, supported by tables and figures, to clearly summarize respondent demographics, caffeine consumption behavior, and productivity-related perceptions.

Table 1. Demographic Characteristics of Respondents (N = 400)

Category	Frequency	Percentage (%)
Age 18–24	280	70.0
Age 25–34	75	18.8
Age 35–44	30	7.5
45 and above	15	3.7



Total	400	100
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The respondents' demographic details are shown in Table 1. The results show that the majority of participants were between 18 and 24 years old, indicating that most respondents were within the typical age range of undergraduate university students. Smaller proportions of respondents belonged to older age groups. This demographic distribution suggests that the findings primarily reflect the experiences and behaviors of students who are actively engaged in academic activities and face regular study-related demands.

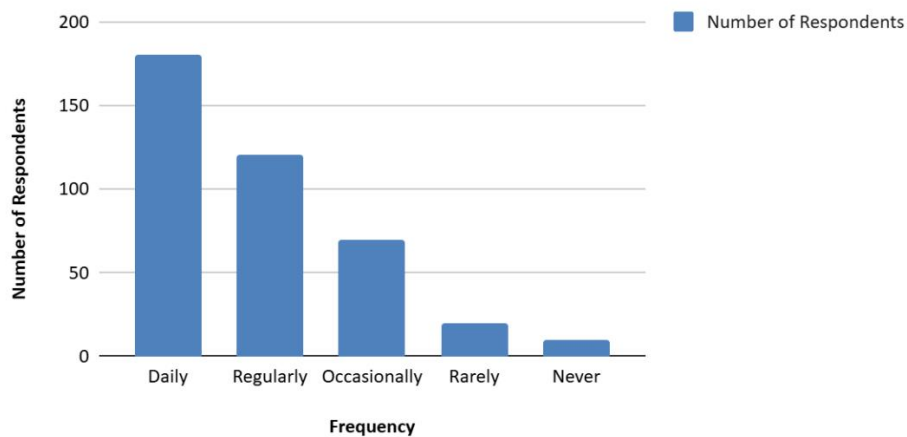


Figure 3 Frequency of caffeine consumption among respondents

Figure 3 illustrates the frequency of caffeine consumption among respondents. The figure shows that a large proportion of students consume caffeine daily or regularly, while a smaller number reported occasional, rare, or no caffeine consumption. This pattern indicates that caffeine consumption is a common habit among university students and plays a significant role in their daily routines. The high frequency of consumption suggests that caffeine is widely used as a means of maintaining alertness and managing academic workload.

Table 2. Perceived Effects of Caffeine on Productivity

Survey Statement	Agree (%)	Neutral (%)	Disagree (%)
Caffeine improves focus	72	18	10
Caffeine helps complete tasks efficiently	68	20	12
Productivity decreases without caffeine	61	25	14

Table 2 summarizes respondents' perceptions regarding the effects of caffeine on productivity. The results indicate that most respondents agreed that caffeine improves focus and helps them complete tasks more efficiently. In addition, a considerable proportion of respondents reported that their productivity would decrease if they stopped consuming caffeine. These findings suggest that students generally perceive caffeine as a supportive factor in their academic performance and daily task completion.

To further examine the relationship between caffeine consumption and productivity indicators, a correlation analysis was conducted. The results indicated a positive correlation between frequency of caffeine consumption and perceived productivity ($r \approx 0.32$, $p < 0.05$). This suggests that students who reported consuming caffeine more frequently also tended to report higher levels of focus and task efficiency. Although the relationship is moderate, it supports the descriptive findings that caffeine consumption is associated with increased perceived productivity among students.

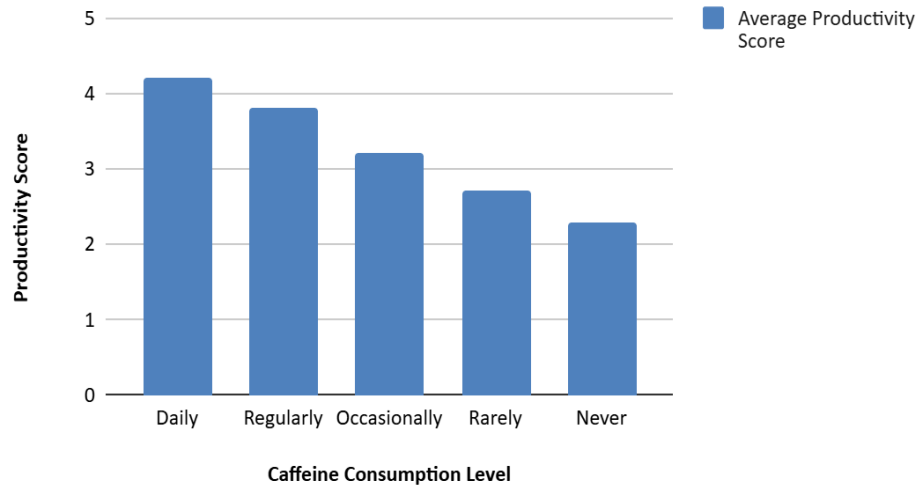


Figure 4 Relationship between caffeine consumption and self-reported productivity.

Figure 4 presents the relationship between caffeine consumption level and self-reported productivity. The figure demonstrates a clear pattern in which higher levels of caffeine consumption are associated with higher reported productivity levels. Students who reported daily or regular caffeine consumption tended to report higher productivity compared to those who consumed caffeine rarely or not at all. This visual pattern reinforces the findings presented in Table 2 and highlights a positive association between caffeine intake and perceived productivity.

Overall, the results suggest that caffeine consumption is widespread among university students and is commonly perceived as beneficial for enhancing focus and productivity. However, the results are based on self-reported perceptions and therefore reflect subjective experiences rather than objective productivity measurements.

4.2 Discussion

The findings of this study indicate that caffeine consumption is deeply integrated into the daily lives of university students and is widely used as a strategy to support academic productivity. The high frequency of caffeine consumption observed among respondents suggests that students often rely on caffeinated beverages to cope with academic pressure, long study hours, and mental fatigue. This finding is consistent with previous research showing that caffeine is commonly used in academic environments to maintain alertness and concentration. The positive perceptions of caffeine's effects on focus and task efficiency, as shown in Table 2 and Figure 4, suggest that students believe caffeine enhances their ability to concentrate and complete academic tasks more effectively. One possible explanation for this perception is caffeine's stimulant effect on the central nervous system, which increases alertness and reduces feelings of tiredness. Improved alertness may allow students to sustain attention for longer periods, leading to higher perceived productivity. However, the results also suggest that caffeine does not affect all students in the same way. While many respondents reported positive effects, a portion of students expressed neutral or less positive perceptions. This variation may be influenced by individual differences such as caffeine tolerance, sensitivity, consumption habits, and timing of intake. Students who consume caffeine excessively or late in the day may experience reduced benefits, including difficulty sleeping, which could negatively affect productivity in the long term. The findings of this study are generally consistent with earlier research examining the cognitive and behavioral effects of caffeine consumption. Previous studies have shown that moderate caffeine intake can enhance alertness, attention, and mental energy, which may support individuals when performing cognitively demanding tasks. For instance, Einöther and Giesbrecht (2013) reported that caffeine can improve sustained attention and reaction time, particularly in situations where



individuals experience fatigue or prolonged mental effort. These physiological effects may help explain why many respondents in this study perceived caffeine as beneficial for maintaining focus and completing academic tasks more efficiently. Similarly, Smith (2021) suggested that caffeine can positively influence perceived mental performance and motivation, which may encourage individuals to remain engaged in their work or studies for longer periods.

However, the results of this study also indicate that the relationship between caffeine consumption and productivity is not entirely straightforward. While a majority of respondents reported positive effects, some participants expressed neutral or mixed perceptions regarding caffeine's impact on their productivity. This variation may be attributed to several individual factors, including caffeine tolerance, personal sensitivity to stimulants, habitual consumption patterns, and lifestyle factors such as sleep quality and stress levels. Research has suggested that individuals who consume caffeine frequently may develop tolerance over time, meaning that the stimulant effects may gradually weaken and require higher doses to produce similar results. In such cases, caffeine may no longer enhance productivity but instead help individuals maintain their baseline level of alertness.

Furthermore, excessive caffeine consumption may produce negative physiological and psychological effects that could counteract its potential benefits. Studies have linked high caffeine intake with symptoms such as anxiety, restlessness, increased heart rate, and sleep disturbances. Poor sleep quality, in particular, can have a significant impact on cognitive performance, memory retention, and overall productivity. When individuals consume caffeine late in the day to remain alert, it may disrupt their natural sleep cycle, which can lead to fatigue and reduced concentration in the following days. This cycle may encourage continued caffeine consumption as individuals attempt to compensate for insufficient rest. Taken together, the findings of this study suggest that caffeine may act as a short-term cognitive stimulant that helps students maintain alertness and perceived productivity during demanding academic periods. However, its effectiveness appears to depend on factors such as consumption level, individual sensitivity, and overall lifestyle habits. Moderate caffeine intake may provide temporary benefits for focus and task performance, whereas excessive reliance on caffeine may reduce its effectiveness and potentially lead to negative health outcomes. Therefore, students should be encouraged to approach caffeine consumption with awareness and moderation to balance its potential advantages with its possible risks.

Another important consideration is that the perceived relationship between caffeine consumption and productivity does not necessarily imply a direct causal effect. It is possible that students who are already highly motivated or engaged in their studies are more likely to consume caffeine as part of their study routine. In this sense, caffeine consumption may be associated with productivity rather than being its sole cause. This highlights the importance of interpreting the findings with caution. Despite these limitations, the findings provide valuable insights into students' caffeine consumption behavior and its perceived role in academic productivity. The results suggest that moderate caffeine consumption may be beneficial for supporting focus and task efficiency, particularly during demanding academic periods. At the same time, excessive reliance on caffeine may reduce its effectiveness and potentially lead to negative outcomes. Overall, this study contributes to a better understanding of how university students perceive the role of caffeine in their productivity. The findings can help students make more informed decisions about their caffeine consumption habits and may also inform educational institutions about the importance of promoting balanced and healthy study practices.

5. Study Limitations

This study has several limitations that should be acknowledged. First, the findings are based on self-reported perceptions of productivity, which may not always reflect actual productivity or performance outcomes. Second, the research used convenience sampling and focused on students from a single university, which may limit the generalizability of the results to other populations or educational contexts. Third, the cross-sectional design captures caffeine consumption behavior at only one point in time and does not allow the establishment of causal relationships between caffeine consumption and productivity. Future research could address these limitations by including participants from multiple universities, using longitudinal research designs, and incorporating objective measures of productivity to provide a more comprehensive understanding of caffeine's effects on academic performance.



6. Conclusion

This study examined the relationship between caffeine consumption and productivity among university students. The findings show that caffeine is widely used to enhance focus, alertness, and efficiency, particularly during periods of academic stress or fatigue. Most participants perceived caffeine as beneficial for improving concentration and task performance. However, the results also suggest that its effects vary among individuals depending on consumption habits, tolerance, and sensitivity. While moderate intake can improve short-term focus and energy, excessive use may cause anxiety, restlessness, and sleep disturbances, ultimately reducing overall productivity. These findings indicate that caffeine's impact on productivity is both physiological and psychological boosting alertness but not always guaranteeing better performance. Therefore, moderation and self-awareness are key to maximizing its benefits while minimizing its risks. Future research should explore objective measures of productivity and long-term effects across different populations and work environments to provide more comprehensive insights into caffeine's role in performance enhancement.

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